Basic First Aid

Student Manual

Medican Education and Employment

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Note: This course, including all instructional materials, activities, and evaluations, is aligned with CSAZ1210:24 standards. Completion of this program meets the competency requirements for the Basic First Aid - CPR and AED level C course.

Chapter 1: Basics of First Aid

LEARNING OBJECTIVES

By the end of this chapter, learners will be able to:

1. Understand the fundamentals, goals, and real-world importance of First Aid.
2. Recognize and respond effectively to emergencies in various settings and at any time.
3. Apply legal and ethical principles, including Good Samaritan Laws and Duty to Act, when providing care.
4. Identify and overcome common barriers or hesitations to delivering First Aid.
5. Use personal protective equipment (PPE) and infection-control measures to ensure safety for self and others.
6. Assess and manage ill or injured persons while maintaining their dignity and providing ongoing support.
7. Document and communicate observations accurately for safe handover to professional responders.

Emergencies can happen anywhere in School, Home, Public spaces and it can happen anytime, Morning, Afternoon, Evening or Night. In that Critical Moment there is a question of Life and death where First Aid and CPR steps in. It is very important to take right initiative to save life of ill or injured person because that decides if that person is going to survive or die. Before going in depth, it is foremost important to know about basics of First Aid and CPR. In this Chapter We will discuss Fundamentals of First aid, 3-main goals of First aid, Different ways to provide First aid. We will also discuss laws in Canada to keep in mind while providing First aid which includes legal responsibilities, Duty of act, Abandonment.

In the following sections, we will also follow Maria, an everyday community member, as she encounters different scenarios where first aid skills make a difference. Her experiences will highlight the real-world importance of the knowledge you are about to gain in this course.

"Knowing first aid may not change the world, but it could change someone's world today."?

1.1: FUNDAMENTALS OF FIRST AID

WHAT IS FIRST AID?

First Aid is the immediate care given to a person who is injured or suddenly becomes ill. It is not full medical treatment; it is the first response before trained professionals take over.

Prevention is always better than cure. Preventive measures reduce the risk of sudden illness, injury, or death. To Prevent, It is important to do Hazard identification which help to look around for potential dangers whether it's your home, workplace, public place, anywhere. After identifying potential hazard, It is important to consider how you can protect yourself and others.

"It is better to have first aid knowledge and never need to use it than to face an emergency unprepared and helpless."

GOALS OF FIRST AID

There are three main goals of First Aid:

1. Save a Life: The primary goal of first aid is to preserve life.
2. Prevent Further Harm: First aid aims to stop a condition from worsening.
3. Promote Recovery: First aid also begins the healing process.

The speed with which a first aider recognizes an emergency and acts often determines the outcome: life or death, temporary or permanent disability, or a short recovery versus long hospitalization.

1.2 WHY PEOPLE HESITATE TO PROVIDE FIRST AID

Even though most people want to help in an emergency, many hesitate for two main reasons:

1. Fear of Doing Something Wrong

Some worry they might cause harm or be held legally responsible. Reassuringly, most provinces and territories have Good Samaritan Laws that protect first aiders who act in good faith.

2. Fear of Infection

Others hesitate because they fear contracting a disease. This risk can be minimized by using Personal Protective Equipment (PPE) and following infection-control protocols.

3. Lack of Confidence or Training

People might lack confidence due to which the person might suffer or lack of training prevent action, regular training builds confidence.

4. Panic or Emotional Stress

Shock or fear may cause hesitation, specially when your loved one is in front of you needing help and emotional stress cause shock or panic. However, in that crucial time it is very important to stay calm and follow basic steps that helps.

5. Uncertainty About the Situation

Unsure if the person truly needs help, specially when a lot of people surrounds the ill person, However, never assume that someone is helping the ill or injured person. If you are sure that someone is providing first aid offer to help get supplies, control crowd, Call EMS/911

6. Cultural or Social Barriers

There might be concerns about touching strangers or someone of the opposite gender. However, in case of emergency a life is more important than considering social or cultural barrier. Therefore, obtain consent and respectfully offer help.

By understanding these common hesitations, first aiders can prepare mentally, follow safety measures, and act confidently when emergencies occur.

1.3 LAWS FOR FIRST AIDERS IN CANADA

In Canada, there is no general legal obligation to provide first aid (with the exception of Quebec, where individuals may be legally required to assist). However, people may worry about being sued if they make a mistake. The Good Samaritan Laws are designed to protect and encourage bystanders who step in to help.

THE FIVE PRINCIPLES OF THE GOOD SAMARITAN LAWS

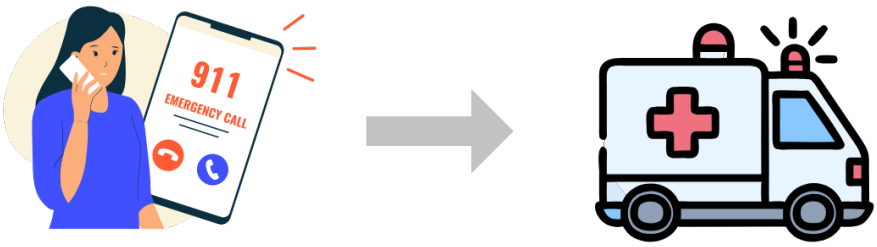
When providing first aid, always:

1. **Provide care** without expecting payment.
2. **Identify yourself and obtain consent** from the ill or injured person before giving help. Clearly explain what you are about to do.
3. **Act within your training and skill level**. Only use techniques you have been taught.
4. **Act in the best interest of the person**. If you knowingly do something that puts them at risk (e.g., exceeding your training and causing further injury), it is considered negligence, and the law will not protect you.
5. **Do not abandon the person**. Once you begin care, stay with the individual until EMS personnel arrive or another trained person takes over. Leaving before that point may be considered abandonment.

Workplace First Aider Role:

The workplace first aider has a dual role: providing immediate emergency care during incidents and supporting the employer's Occupational Health and Safety Management System through hazard reporting, documentation, and compliance with safety procedures

- Recognizing injuries and medical emergencies
- Providing immediate first aid and CPR/AED
- Assisting with medications as permitted by the AHJ
- Activating EMS and coordinating handover
- Documenting care provided
- Protecting personal and scene safety



DUTY TO ACT

Some occupations require first aid as part of the job description. In these cases, individuals have a legal duty to act. Failure to provide proper care when legally obligated may be considered a breach of duty, and Good Samaritan protections will not apply.

Examples of occupations with a duty to act include:

- Police officers
- Firefighters
- Park rangers
- Athletic trainers
- Lifeguards

Key Focus: Confidence, legal awareness, safety, and ethical responsibility in first aid.

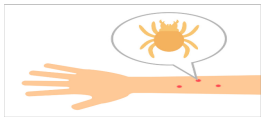
Case Scenario: *Maria is driving home when she sees a car accident. She pulls over, introduces herself to the injured driver, and asks for permission to help. She applies pressure to stop the bleeding and stays with the person until EMS arrives. By following the Good Samaritan principles, Maria is legally protected.*

1.4 PROTECTIVE MEASURES

First aiders must take steps to reduce the risk of disease transmission when caring for an ill or injured person.

ROUTES OF DISEASE TRANSMISSION

An infection occurs when germs (such as bacteria or viruses) enter the body and cause illness. Infectious diseases can spread from person to person in several ways:

Skin-to-Skin Contact Diseases may spread when infected skin cells touch broken skin or mucous membranes (e.g., mouth, eyes).	
Airborne Transmission Tiny droplets released by sneezing, coughing, or talking can enter another person's nose, mouth, or eyes.	
Bodily Fluids Contact with blood, saliva, vomit, or other bodily fluids can spread germs.	
Contaminated Objects (Fomites) Germs can survive on surfaces such as doorknobs, clothing, or medical equipment.	
Injuries From Sharp Objects Used needles or other sharp instruments can introduce bloodborne pathogens through skin punctures.	
Bites and Vector Transmission Insects (e.g., mosquitoes, ticks) and animals can transmit infectious agents to humans.	

HAND WASHING

For first aiders, proper hand washing is one of the simplest and most effective ways to prevent disease transmission. Hands should always be washed before and after providing care.

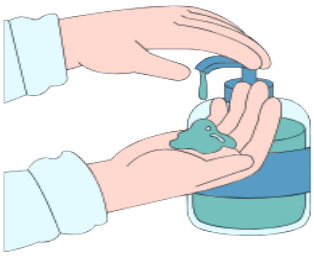
The World Health Organization (WHO) recommends the following steps technique:

1. Wet hands with clean, preferably running water.
2. Apply soap to cover all surfaces of hands and wrists.
3. Lather and Scrub – Rub hands vigorously, ensuring you clean all surfaces: palms, backs of hands, fingertips, fingernails, thumbs, and wrists. Continue for at least 20 seconds.
4. Rinse – Rinse hands and wrists thoroughly under clean, preferably running water.
5. Dry – Use a clean towel or allow hands to air dry.
6. Turn Off the Tap Safely – Use a towel to close the faucet.
7. Exit Without Recontamination – Use the towel to open the door handle if needed.

Precautions

- Wash your hands thoroughly with soap and warm water immediately after providing care.
- Do not touch your face, eyes, nose, or personal items (such as keys or phone) until you have washed your hands properly.

"Remember: Hand sanitizer is not a substitute for handwashing. It should only be used when soap and water are unavailable."



GLOVES

Gloves are one of the most important pieces of PPE. They prevent direct hand contact with blood, bodily fluids, or contaminated materials. When removing gloves, ensure the outside surface never touches your skin:

Step 1: Pinch and Peel With one hand, grasp the outside of the glove at the wrist and peel it off, turning it inside out. Hold the removed glove in your gloved hand. Picture	
Step 2: Slip and Remove With your bare fingers, slide two fingers under the cuff of the remaining glove. Peel it off over the first glove, keeping both inside out. Picture	
Step 3: Dispose Properly Discard used gloves in a biohazard container or sealed plastic bag if biohazard disposal is unavailable. Picture	
Step 4: Wash Hands Wash thoroughly with soap and water immediately after removing gloves. Picture	

EYE SAFETY GOGGLES

Eye-protecting goggles are tight-fitting eyewear designed to shield the first aider's eyes from splashes of bodily fluids such as blood, vomit, or saliva. They are especially important when there is a high risk of fluid exposure during first aid procedures.

CPR BREATHING MASKS

"CPR breathing masks are critical for reducing the risk of infection when giving rescue breaths to an unconscious person. "They protect the first aider from contact with saliva, exhaled air, and other body fluids. Two common types are:

1. Face Shield

- A flat, thin piece of plastic with a one-way valve in the center.
- Lightweight, portable, and inexpensive.
- Limitations: Less secure, can shift or blow away in windy conditions, especially during outdoor rescues.

2. Pocket Mask

- A transparent, flexible mask designed to form a tight seal over the nose and mouth.
- Includes a one-way valve that prevents contact with the person's fluids.
- Made of both soft (outer edge) and hard (structure) plastic for comfort and durability.
- Shaped with a narrow end for the bridge of the nose and a wide end over the jaw.
- Often equipped with an elastic strap to secure it to the face.
- Advantage: Provides better protection and is ideal for effective rescue breathing.

FACE MASKS (GENERAL USE)

Face masks, such as surgical or multi-layer cloth masks, are one of the most effective public health measures for preventing the spread of respiratory infections, including COVID-19. A well-constructed, well-fitted, and properly worn mask helps reduce the risk of both transmitting and contracting infections. Keeping at least one face mask in a first aid kit is recommended.

DONNING AND DOFFING OF PPE

Properly putting on and removing PPE is essential to prevent contamination.

Donning (Putting On PPE):

1. Wash hands thoroughly before touching PPE.
2. Put on gown or protective clothing if required.
3. Put on mask or respirator securely.
4. Put on eye protection or goggles.
5. Put on gloves, ensuring they cover the wrist of the gown or clothing.

Doffing (Removing PPE):

1. Remove gloves carefully, turning them inside out.
2. Remove eye protection without touching the front.
3. Remove gown without touching the outside surface.
4. Remove mask last, handling only the straps.
5. Wash hands thoroughly immediately after removing all PPE.

Key Points:

- Treat all PPE that has contacted blood, bodily fluids, or infectious material as potentially contaminated.
- Always wash hands thoroughly after removing and disposing of PPE. Follow your local or workplace regulations for biohazard waste disposal.

DISPOSAL OF PPE

Proper disposal of PPE is essential to prevent contamination and protect both the first aider and others.

Guidelines for PPE Disposal:

1. Gloves:
   - i Remove carefully (inside out) and place in a biohazard container or a sealed plastic bag if a biohazard bin is unavailable.
   - ii Never reuse disposable gloves.
2. Masks and Face Shields:
   - i Dispose of single-use masks and face shields in a biohazard container or sealed plastic bag if contaminated.
   - ii If reusable, follow the manufacturer's instructions for cleaning and disinfection.
3. Gowns and Protective Clothing:
   - i Dispose of disposable gowns in a biohazard container.
   - ii Wash reusable gowns according to infection-control guidelines.
4. Eye Protection / Goggles:
   - i Clean and disinfect reusable goggles after each use.
   - ii Do not share PPE without proper disinfection.
5. Sharps and Needles:
   - i Always place used needles or sharps in a puncture-resistant sharps container.
   - ii Never recap, bend, or break needles before disposal.

Case Scenario: *After treating a small cut at her workplace, Maria goes to the sink and follows the 7-step WHO handwashing method. She makes sure to scrub for 20 seconds, dry her hands, and use a towel to turn off the tap. This routine helps reduce disease transmission.*

Chapter 2: Emergency Scene Assessment Survey

LEARNING OBJECTIVES

By the end of this chapter, learners will be able to:

1. Understand and apply a structured Emergency Scene Assessment Survey (ESAS) to respond safely and effectively to emergencies.
2. Identify hazards and risks at the scene to protect yourself, bystanders, and the casualty.
3. Check responsiveness, airway, breathing, and circulation to recognize life-threatening conditions quickly.
4. Obtain consent from conscious individuals or assume implied consent when necessary.
5. Call EMS/911 promptly and coordinate help while providing immediate life-saving care.
6. Perform ongoing care, including recovery positioning, monitoring, and first aid interventions, until professional help arrives.
7. Communicate clearly, gather relevant medical history, and document observations for effective handover to emergency responders.

"Panic closes the mind; preparation opens it."

Emergency Scene Assessment Survey (ESAS) means having a structured plan to respond safely and effectively to any emergency. It helps First Aiders protect themselves, organize the situation, and provide proper care until professional help arrives.

GOALS OF ESAS:

- Keep yourself and others safe.
- Assess what has happened and what dangers exist.
- Provide immediate life-saving care.
- Get professional help quickly.
- Continue supporting the injured or ill person until care is transferred.

2.1 PROTOCOLS FOR DEALING EMERGENCIES

Emergency care follows two categories of action steps:

1. Scene Survey & Management

These apply to every emergency, whether the person is conscious or unconscious. Complete these steps before giving any specific care.

1. Check the Scene for Safety
2. Take Personal Safety Precautions
3. Check Responsiveness
4. Get Consent
5. Call EMS/911

2. Primary Survey

Check for Life-Threatening Problems (ABCs)

3. Secondary Survey

Check for Non–Life-Threatening Problems

4. Ongoing Care

Provide Ongoing Care Until Help Arrives

"Assess, don't assume — the scene always tells a story."

2.2 SCENE SURVEY

Before approaching, stop, look, listen, and think. The first few seconds are critical; they allow you to make the scene safe and gather important information.

A hazard is anything that can cause harm. Examples: fire, electricity, sharp debris, chemicals, unstable buildings, violent behavior, traffic.

Risk is the chance that the hazard will actually harm someone. Example: A live wire is a hazard; touching or walking near it raises the risk of electrocution.

1. CHECK THE SCENE SAFELY

Before giving any first aid, the first aider must make sure the scene is safe. Your safety always comes first. A careful scene check helps you recognize hazards, understand what happened, and decide how to approach the situation.

1. Observe from a Distance

- Pause before entering the area.
- Scan slowly from left to right and top to bottom.
- Notice the overall layout, the number of people involved, and any obvious dangers.

This first look helps you judge whether it is safe to get closer.

2. Major Hazards You Must Watch For

A. Air Quality and Breathing Dangers, Leave immediately if you detect:

- Smoke
- Gas or fumes
- Chemical vapors
- Lack of ventilation

Breathing hazards can make someone unconscious very quickly.

B. Sharp or Broken Materials, Look for:

- Glass
- Metal pieces
- Jagged objects
- Debris from vehicles or buildings

They can cause deep cuts or severe bleeding.

C. Fire, Heat, and Chemicals, Avoid:

- Flames
- Hot surfaces
- Steam
- Chemical spills
- Smoke-filled areas

These hazards can spread fast and cause major injuries.

D. Electrical Hazards, Stay clear of:

Downed power lines

- Exposed wires
- Wet areas near electrical sources
- Damaged electrical equipment
- Electricity can injure or kill without direct contact.

3. Ask Yourself Key Safety Questions

Before approaching the person:

1. Is it safe for me to enter?
2. Could the situation become worse quickly?
3. Can I make the area safer without risking myself?
4. Do I need EMS, fire, or police before getting closer?
5. Are there hazards I cannot control?

If you cannot say “yes, it is safe,” stay back.

4. Ask Bystanders for Information

Bystanders can help you understand what happened, especially if the person cannot speak or the incident was sudden.

Ask simple, direct questions:

- "Did you see what happened?"
- "When did this start?"
- "Did they fall, collapse, or complain of pain first?"
- "Did they take any medication before this happened?"
- "Has anything changed since the incident?"

Use this information to:

- Identify hazards
- Understand how the injury or illness occurred
- Determine what first aid may be needed
- Provide accurate information during EMS handover

Do not rely solely on bystanders—always confirm what you can through observation.

5. Decide Safely

If the scene is safe:

- Approach carefully and continue monitoring for hazards.
- Position yourself in a stable, safe spot.

If the scene is unsafe:

- Do NOT enter the area.
- Call emergency services.
- Prevent others from entering.
- Help from a safe distance when possible (verbal instructions, guiding the person to safety if they can move).

Remember: A first aider who becomes injured cannot help anyone.

2. TAKE SAFETY PRECAUTIONS

1. Protect yourself by using Personal Protective Equipment (PPE) such as gloves, masks, and eye protection.
2. Hand Hygiene is Essential: Wash your hands with soap and water before and after providing care. Use hand sanitizer if soap is unavailable.
3. Treat All Body Fluids as Potentially Infectious: Blood, saliva, vomit, and other fluids can carry harmful germs. Avoid direct contact at all times.
4. Never Touch Sharp or Broken Objects: Broken glass, metal, or needles can cause injuries and increase the risk of infection.
5. Dispose of Materials Safely: Place gloves, gauze, and other used items in sealed bags or designated biohazard containers.
6. Clean and Disinfect the Area: After the emergency, wipe down any surfaces or tools touched during care with an appropriate disinfectant.
7. Keep Your Immunizations Up to Date: Vaccines, such as tetanus and hepatitis immunizations, help protect you during emergencies.
8. Restock PPE and First Aid Supplies: Replace gloves, masks, bandages, and other materials immediately so the kit is ready for the next emergency.

"You can't help others if you become the next casualty."

3. CHECK RESPONSIVENESS

After making sure the scene is safe and you are wearing gloves and other appropriate personal protective equipment, the next step is to check if the person is conscious or unconscious. This is an important step because it helps you decide what kind of care is needed.

1. Approach Safely

- Walk carefully and make sure there are no hazards around the person.
- Do not rush – your safety comes first.

2. Speak Clearly

- Stand close enough to the person to be heard but not too close to invade their space.
- Say something simple, like: “Are you okay?”
- Speak in a calm but loud enough voice so the person can hear you.

3. Tap Gently

- If the person does not respond to your voice, gently tap their shoulders.
- For a baby gently flick the bottom of their feet.
- Do not shake them harshly.

Interpreting Responses.

Responsive: You can say a person is conscious when they show any purposeful response to you or their environment. In first aid, consciousness is based on responsiveness, not just having eyes open. You may say a person is conscious if they:

- Are awake and alert
- Answer questions appropriately (speech or gestures)
- Respond to verbal stimuli (turning head, nodding, speaking)
- Respond to touch (moving, pushing your hand away, purposeful movement)
- Follow simple commands (e.g., “squeeze my hand,” “open your eyes”)

Unresponsive: The person does not respond to voice or gentle tap. This indicates a potential medical emergency, such as cardiac arrest or severe trauma. Immediately:

- Call EMS/911.
- Check breathing and pulse (if trained).
- Begin CPR or other life-saving interventions as needed

Why Checking Responsiveness Is Important

- It tells you how urgently the person needs help.
- Helps you decide the next steps in first aid.
- An unconscious person cannot make decisions, so you assume implied consent to provide care.

Key Tip: *Always treat someone who is unresponsive as a medical emergency until proven otherwise. Quick, calm, and systematic action saves lives.*

4. GET CONSENT

For a conscious adult, identify yourself and ask for permission before giving care:

"Hi, my name is [Your Name]. I am trained in First Aid and CPR. May I help you?"

If the person refuses help, do not touch them — call EMS and stay nearby, if it is safe.

Principle of Consent

Implied Consent

When an ill or injured person cannot provide consent, implied consent is assumed. The concept of implied consent is simple: it is assumed on the principle that a reasonable person under the circumstances would give consent for first aid if they were able to. Put it this way: if you fell unconscious, would you want someone to help you get to the hospital instantly, or would you rather be left alone?

If a victim cannot answer due to injury and is alone, you can assume you have consented to give first aid. This presumed consent is called implied consent. In the following conditions, consent is implied:

1. If a person is unconscious and alone
2. If a person is conscious but not competent
3. If a baby or child is alone

An ill or injured person must be alert and have the capacity to make informed decisions regarding their care. In certain conditions, such as head injuries, mental illness, drug use, intoxication, diabetes, and shock, the ill or injured person may be conscious but not alert and able to provide consent. In such situations, get consent from the family members or caregivers. If the person is alone, consent is implied.

In the case of a baby or a child, get consent from a supervising adult. If supervising adult refuses to consent, do not force your help. Document that person refused help. If the condition of an ill or injured baby or child is serious, call EMS/911 and let them decide.

5. CALL EMS/911

Emergency Medical System (EMS) is a group of professionals working to provide medical help. EMS includes ambulance services, paramedics, hospital emergency departments, doctors, nurses, and fire departments. EMS can easily and quickly be contacted by calling a three-digit number that varies in different regions. For example, the three-digit number to contact EMS in Canada is 911.

In an emergency, every second counts. Calling EMS/911 is the most crucial step in getting help for an ill or injured person. The sooner you call EMS/911, the better the chances of the victim's survival.

When to Call EMS:

- Call EMS/911 immediately if there is a danger to you or others.
- If you have any doubts about the condition of an ill or injured person, call EMS/911 immediately. It is better to have EMS personnel with the ill or injured person while not needed than if the person does not receive timely medical attention and dies.
- In case of any Injury: An injury is an area of the body that suffers damage from an external source. Examples of injuries for which we call EMS/911 are: Injuries to the head, neck, or back, Motor vehicle accidents, Life-threatening external or internal bleeding, Fall from a height, Injuries caused by fires, Injuries caused by poisonous gas, Victims of violence, Drowning.
- Illness: Serious sickness can become a medical emergency. Examples of the illness when we should call EMS/911 are: Unresponsiveness, Difficulty breathing or no signs of breathing, Persistent chest pain or pressure, Complete choking, Repeated seizures, Drug reactions, An apparent mental health crisis, Imminent childbirth.

Key point: If something feels serious, uncertain, or beyond your ability to manage safely, it is always better to call. When in doubt — call for help.

Who will call EMS/911?

- If another person is available to help at the scene
  - Instruct them to FIRST call EMS/911, then proceed to find an AED.
  - If the helper must leave the scene to find a phone to call EMS/911, ask them to come back and report you to ensure the call has been placed. Also, if they see another helper on the way to call, advise them to find an AED and send them to the emergency site to assist.
- If you are alone at the scene and you have a cell phone
  - Call EMS/911 and set the phone on the ground. Tell them the location of the emergency, your name, and your telephone number. Tell them how many people need help and about their conditions.
- If you are alone on the scene and you do not have a cell phone
  - Shout for help; if someone comes, ask them to call EMS/911 first and quickly bring an AED while you start caring for the ill or injured person.
  - To ensure that EMS/911 has been informed, ask them to return and report you. Also, tell them if they see someone on the way to find an AED, tell them to come to the emergency site to assist you.
- If you are alone and do not have a cell phone and nobody comes to help
  - If nobody responds to your shouting, you will have to go and find a phone to call EMS/911.
  - Before leaving an ill or injured person alone, you will assess their condition and decide what kind of help they need before leaving them alone. For example, are they bleeding profusely? Do they need to be placed in a better position? We will discuss these conditions in the next chapter.

2.3 PRIMARY SURVEY

The Primary Survey is a quick, 5 to 10 seconds check for life-threatening problems. Life-threatening conditions include choking, no breathing, breathing difficulties, heart attacks, stroke, major bleeding and shock.

After confirming the scene is safe, the first aider must quickly check the person for any life-threatening injuries or conditions. These are problems that can cause death within minutes if not treated immediately. The assessment must be fast, calm, and systematic. Following are the steps to check Life-Threatening Problems.

STEP 1: AIRWAY

A clear airway is essential for breathing. If the airway is blocked, oxygen cannot reach the lungs or brain.

Check the airway:

- Look inside the mouth for any visible obstructions — food, vomit, or fluid.
- Remove what you can see, but do not use your fingers blindly, as you may push objects deeper.
- Turn the person's head slightly to the side if vomiting occurs.

Opening Airway Methods (Airway Maneuvers):

Head-Tilt/Chin-Lift Method:

1. Place four fingers of one hand on the person's forehead.
2. Place two fingers of your other hand under the bony part of the chin — not the soft tissue.
3. Gently tilt the head back and lift the chin upward until it points slightly toward the ceiling.
4. This lifts the tongue away from the airway, allowing air to pass freely.

Jaw Thrust Maneuver (No Head Tilt):

1. Kneel behind the person's head.
2. Place your fingers behind the angles of the jaw.
3. Lift the jaw upward and forward.
4. Avoid moving the head or neck.

Key point: This Airway Maneuver requires proper training and practical practice.

Clearing and Maintaining the Airway

Once open: Jaw Thrust Maneuver (No Head Tilt)

- Keep your hands in position to maintain airway control.
- If fluids or vomiting are present, roll the person onto their side and clear the mouth before continuing.
- If the person is conscious reassess breathing after every 2 minutes.
- If the person is unconscious but still breathing check after every 2 minutes.
- If the person is unconscious and not breathing, start CPR immediately.

Indications for Airway Maneuvers

You will perform airway-opening techniques when:

- The person is unresponsive or has reduced level of consciousness. When a person becomes unconscious, their tongue may fall backward and block the windpipe.
- The person is not breathing normally. You must open the airway before assessing breathing.
- There is visible obstruction in the mouth, such as food, vomit, or fluid.
- The airway sounds blocked, Gurgling, snoring, gasping, or silence can indicate airway compromise.

Contraindications (When Not to Use Certain Maneuvers)

Some airway methods must not be used in specific situations:

- Suspected head, neck, or spinal injury: Do not use the Head-Tilt/Chin-Lift if trauma is suspected. Instead, use a Jaw Thrust without tilting the head.
- Blind finger sweeps: Never sweep your fingers inside the mouth unless you clearly see an object. Blind sweeps may push an obstruction deeper.
- Forcing the head back: Over-extension can narrow the airway, especially in infants.

Precautions for Safe Airway Management

- Move the head gently. Sudden or forceful movement can worsen injury, especially in trauma.
- Only remove visible obstructions. Use a gloved hand or gauze if available.
- Watch for vomiting. Unresponsive people may vomit. Be prepared to roll the person onto their side if needed.

Note: Jaw-thrust/Head-tilt choices depend on suspected spinal injury and that airway maneuvers require hands-on practice under supervision.

STEP 2: BREATHING

Once the airway is open, check if the person is breathing normally.

Check for 5–10 seconds using the "Look, Listen, and Feel" method:

- Look: For chest movement — rising and falling.
- Listen: For breath sounds near the mouth and nose.
- Feel: For warm air.

Normal breathing:

An adult takes between 12 and 20 breaths per minute; it means at least one breath every 5 seconds (60 seconds/12 = 5). Always check for breathing for 5 to 10 seconds, which means check for breathing for not less than 5 seconds and not more than 10 seconds.

Abnormal or no breathing:

If a person is not taking a breath regularly and struggling to breathe, their breathing is abnormal. They may gasp for air, which is called agonal breathing. It is a natural reflex when the brain is not getting oxygen. Agonal breathing is equivalent to taking no breaths.

Start CPR immediately: (covered in detail in Chapter 3) include:

- 30 chest compressions
- 2 rescue breaths
- Use an AED as soon as one is available.

Remember: CPR is only required for unconscious individuals who are not breathing.

STEP 3: CIRCULATION

Next step is to check for severe bleeding and signs of shock, both of which can be life-threatening.

During Primary Survey, quickly scan for bleeding:

- Look for large wounds or heavy bleeding.
- Apply direct pressure with a clean cloth, dressing, or your gloved hand.
- Maintain pressure until the bleeding slows or help arrives.
- If possible, raise the injured limb above heart level — only if it doesn't cause pain or further injury.

Key point: Weather person is conscious or unconscious first stop heavy bleeding.

Shock:

Shock is a serious, life-threatening condition that happens when the body cannot move enough blood to the brain, heart, lungs, and other vital organs. Without good circulation, these organs do not get the oxygen and nutrients they need, and the person can get worse very quickly.

Checking circulation helps you see if blood is flowing properly to the skin and organs. Poor circulation is an early warning sign of shock, and finding it early helps you give the right first aid and prevent the condition from getting worse. Signs of shock include pale or cool skin, fast or weak pulse, rapid breathing, sweating, dizziness, confusion, and feeling very weak or faint. (refer to Chapter circulatory emergencies for more detail)

"Safety isn't expensive, it's priceless."

STEP 4: LOOK FOR OTHER LIFE-THREATENING CONDITIONS

Check for Life-threating conditions. You are not diagnosing—just checking for obvious dangers. These conditions require immediate EMS activation and continuous monitoring.

Check for:

- Severe burns
- Penetrating injuries (knife, metal, tools, objects sticking out)
- Seizures that continue or return quickly
- Chest pain suggestive of a heart attack
- Signs of stroke (drooping face, slurred speech, weakness)
- Severe allergic reactions (swelling, hives, trouble breathing)
- Severe asthma attack not responding to medication
- Signs of spinal injury after falls, crashes, or impacts
- Uncontrolled vomiting especially when paired with decreased responsiveness

2.4 SECONDARY SURVEY

The secondary survey is performed after life-threatening conditions have been checked and managed. Its purpose is to gather more information about the person, identify other injuries, and understand what happened. Clear and respectful communication helps the person feel safe and supported while you complete this assessment.

Effective Communication

- Stay Calm and Speak Clearly: A calm tone helps reduce fear and anxiety. Speak slowly, use simple words, and reassure the person that you are there to help.
- Introduce Yourself: Always tell the person who you are and that you have first aid training. Explain what you are going to do before you do it. Example: "My name is ____. I know first aid. I'm going to check you to see if you're injured."
- Ask Simple, Direct Questions. Use short, easy questions that the person can answer quickly:
    - "What happened?"
    - "Where do you feel pain?"
    - "Can you move this part?"
    - "Do you take any medications?"
    - Avoid medical jargon. Ask one question at a time.
- Listen Carefully and pay close attention to:
    - The words they use
    - Their tone of voice
    - Whether they seem confused, tired, or in pain
    - Changes in their responses can signal worsening condition.
- Keep the Person Informed. Tell the person what you are checking and why. This builds trust and reduces stress. Example: "I'm going to look at your leg now just to see if there's any swelling."
- Respect Comfort and Privacy: Be gentle and professional while checking injuries. Ask for permission before touching or moving anything. Maintain their dignity as much as possible.
- Use Non-Verbal Communication, If the person cannot speak:
    - Watch facial expressions for pain. Observe breathing and body movement, Look for gestures or nodding
    - Non-verbal cues can give you important information.

Barriers to Effective Communication

Barriers to effective communication with injured or ill individuals can arise from emotional distress, fear, or pain, which may limit understanding or responsiveness. Environmental factors such as noise, poor lighting, or crowding can interfere with hearing or observing non-verbal cues. Language or cultural differences, as well as the use of medical jargon, may create confusion or misinterpretation. Physical limitations, including hearing, vision, or speech impairments, and distractions on scene can further impede clear communication. Recognizing these barriers is essential for first aiders to adapt their approach and ensure accurate, safe, and empathetic interactions.

TAKE MEDICAL HISTORY

The easiest way to collect important history is by using the SAMPLE approach. Speak calmly, respectfully, and clearly, and write down the answers when possible.

How to Do It

- S – Symptoms

  Ask: “What are you feeling right now?”

  Look for pain, dizziness, nausea, numbness, difficulty breathing, etc
- A – Allergies

  Ask: “Do you have any allergies? Food? Medication? Materials?”
- M – Medications

  Ask: “Are you taking any medications? Did you take any today?”

  Note: prescription, over-the-counter, or recreational substances.
- P – Past Medical Problems

  Ask: “Do you have any medical conditions I should know about?”

  Examples: asthma, diabetes, epilepsy, heart conditions.
- L – Last Intake

  Ask: “When did you last eat or drink? Did you take any medication recently?”
- E – Events Leading Up to the Incident

  Ask: “Can you tell me what happened before you started feeling this way?”

Tips

- Ask one question at a time and Avoid medical jargon.
- Let the person speak without interruption.
- If the person cannot speak, ask bystanders or look for medical alert jewelry.

CHECK VITAL SIGNS

Vital signs help you understand how the body is functioning. They show whether the person is improving, getting worse, or staying stable.

What to Check

1. Breathing Rate and Quality
    - Count breaths for 15 seconds and multiply by 4.
    - Note if breathing is: slow, fast, shallow, deep, noisy, or irregular.
2. Pulse (Circulation)
    - Feel the wrist or neck pulse.
    - Check for: fast, slow, strong, weak, or irregular pulse.
    - Compare both sides if one feels abnormal.
3. Skin Colour, Temperature, and Moisture
    - Colour: pale, bluish, flushed
    - Temperature: warm, cool, hot
    - Moisture: dry, sweaty, clammy, These often reflect circulation and shock.
4. Level of Responsiveness
    - Are they alert?
    - Do they respond to voice or touch?
    - Are they confused?
    - Are they unresponsive?

Tips

- Always explain what you are doing before touching the person.
- Compare your findings to normal behaviour:
  Is this how they normally act or feel?
- Recheck vital signs every 5 minutes if the situation is serious.

PERFORM A HEAD-TO-TOE ASSESSMENT

This is a gentle, systematic check for injuries, pain, or abnormalities. Move from the head down to the feet. Look, listen, and feel.

How to Do It

1. Head and Face
    - Look for bumps, bleeding, or deformities.
    - Check eyes: equal movement? normal colour?
2. Neck
    - Ask if it hurts to move.
    - Look for swelling or medical alert jewelry.
3. Shoulders and Chest
    - Gently press shoulders for pain.
    - Watch chest rise and fall.
    - Ask if breathing is painful.
4. Abdomen
    - Gently press four quadrants.
    - Ask if any area feels tender or painful.
5. Pelvis and Hips
    - Check for pain when the person shifts or you gently press.
6. Arms
    - Look for bleeding, swelling, or deformities.
    - Ask them to move their fingers and hands.
7. Legs
    - Check each leg from top to bottom.
    - Look for pain, deformity, swelling, or inability to move.
8. Back (if safe to roll)
    - Only check if the injury is NOT suspected to involve the spine.
    - Roll carefully with help. Look for bleeding, bruising, or tenderness.

Tips for Learners

- Move slowly and communicate continuously. “I’m going to check your arm now. Tell me if anything hurts.”
- Observe facial expressions for signs of pain.
- Stop immediately if movement causes increased discomfort.

Putting It All Together

After completing the medical history, checking vital signs, and performing a head-to-toe assessment, the next step is to organize the information so care can continue safely and effectively.

Document What You Observed: Record the following clearly and accurately,

- What you saw — injuries, behaviours, symptoms, or hazards
- What you did — first aid steps taken, when they were done, and how the person responded
- Any changes in condition — improvements, worsening signs, or new symptoms

Good documentation ensures that emergency responders and workplace officials can continue care without missing important details.

2.5 ONGOING CARE

Continue to care based on findings until trained responders take over.

Your Role:

- Reassure and talk calmly to the person.
- Keep them warm and dry.
- Watch for changes in breathing or consciousness.
- Recheck bandages and bleeding control.
- Continue holding the head steady if spinal injury is suspected.
- Note and report any changes to EMS when they arrive.

TRANSFER OF CARE (HANDOVER PRINCIPLES)

When emergency medical responders (EMS, paramedics, firefighters, or advanced first aid teams) arrive, the first aider must provide a clear, organized handover. This ensures that professional responders understand what happened and can continue care without delay or confusion.

1. Stay Calm and Make Yourself Visible

- Approach the responders or wait where they can easily see you.
- Identify yourself as the person who provided first aid (e.g., "I'm the first aider who assisted them").
- Keep calm, speak clearly, and avoid giving unnecessary details.

2. Give a Short, Organized Summary (The Handover Report)

Your handover should be brief but complete. Focus on facts, not opinions.

Include these key points (use simple language):

- What happened
    - Describe the incident: “They had an asthma attack while walking,” or “They fell from standing height and hit their head.”
- What you observed
    - Symptoms or behaviours you noticed: difficulty breathing, chest pain, bleeding, confusion, seizures, etc.
- What first aid you provided, Be specific:
    - “I assisted them with their inhaler.”
    - “I applied pressure to control bleeding.”
    - “I gave oral glucose.”
    - “I used their EpiPen because they were having a severe allergic reaction.”
- How the person responded to the care, Improvements, worsening symptoms, or no change:
    - “Their breathing improved after the inhaler.”
    - “They became more alert after the glucose.”
    - “Pain increased in the leg when moved.”
- Times that matter, If applicable, tell them:
    - When symptoms started
    - When medication was taken
    - When first aid was given
- Any important medical information you learned
    - Allergies
    - Medical conditions (asthma, diabetes, heart disease)
    - Medications
    - History related to the incident

3. Provide Documentation

- Hand over any written notes, incident forms, or times you recorded.
- This allows EMS to continue accurate tracking of care.

4. Transfer Care Properly

- Once responders say they are taking over, step back and stop providing care.
- Do not interfere or repeat actions unless asked to help.
- Follow instructions if responders want assistance (e.g., helping move the casualty).

5. Maintain Safety and Respect

- Keep bystanders back while responders work.
- Respect the person's privacy by not sharing unnecessary details with others.
- Stay nearby in case responders have follow-up questions.

2.6 PLACING A PERSON IN THE RECOVERY POSITION

When a person is unconscious but breathing, it's important to position them safely so that their airway stays open and fluids can drain from their mouth. Leaving someone lying flat on their back can be dangerous because their tongue, saliva, or vomit can block the airway.

The recovery position keeps the airway clear and helps prevent choking while you wait for help to arrive.

WHEN TO USE THE RECOVERY POSITION

Use the recovery position if the person:

- Is unconscious but breathing normally
- Has no signs of spinal, head, or major bone injuries
- Needs to stay in a safe and stable position while waiting for help

Do not use the recovery position if:

- The person is fully awake and can control their airway
- There is a suspected spinal, head, or pelvic injury

STEPS TO PLACE A PERSON IN THE RECOVERY POSITION

1. Kneel beside the person, close to their chest. Extend the arm nearest to you straight out beside their head.
2. Take the far arm and place it across their chest. Rest their hand gently against the opposite cheek (the one closest to you).
3. Bend the far leg (the one away from you) so the knee is fully bent and the foot rests flat on the ground.
4. Roll the person toward you by pulling gently on the bent knee and supporting their head and neck with your other hand. The person should roll as one unit until they are on their side, with their head resting on their extended arm.
5. Stabilize the position by placing the bent knee and elbow firmly on the ground. This prevents the person from rolling forward or backward.
6. Tilt the head slightly back, so the airway stays open. Open the mouth slightly so fluids (such as saliva or vomit) can drain safely.
7. Check the ABCs (Airway, Breathing, Circulation) after positioning. Keep monitoring breathing every few minutes.

Important: Only move the person into the recovery position if you are sure it is safe to do so and there is no suspicion of spinal injury. You can place the person on either side — right or left — depending on the situation and space available.

Scenario: Unconscious but Breathing

You find a person lying on the ground, unconscious but breathing normally. There are no signs of severe bleeding. You are alone, and there is no phone nearby.

What to do:

1. Carefully place the person in the recovery position to keep their airway open.
2. Leave briefly to call EMS (911) and, if possible, get an AED.
3. Return to the person and check their breathing every 2 minutes.
4. If breathing stops, roll them onto their back and begin CPR immediately (30 compressions and 2 breaths).

2.7 ROLLING A PERSON FROM A FACE-DOWN POSITION

In some emergencies, you may find a person lying face down. If they are not breathing, they must be turned onto their back right away to start CPR. If they are breathing, it may be safer to leave them as found — just keep checking their breathing regularly.

STEPS TO ROLL A PERSON SAFELY

1. Kneel beside the person's back. Extend the near arm (the one closest to you) above their head.
2. Place the far arm against their side.
3. Cross the far leg over the leg nearest to you.
4. Support the head and neck with one hand and grip their clothing at the waist with your other hand.
5. Roll the person toward you in one smooth motion, keeping their head, neck, and body in a straight line.
6. Once they are face up, open the airway using the head-tilt/chin-lift technique.
7. Check the ABCs:

- If there is no breathing, start CPR right away (30 compressions, 2 breaths).
- If there is breathing, place the person in the recovery position if safe to do so.

Scenario 1: Face Down and Not Breathing

You walk into your office and see your coworker lying face down on the floor. You check — she's unconscious and not breathing.

Action: Roll her gently onto her back without delay, open the airway, and start CPR immediately.

Scenario 2: Face Down but Breathing

You find a coworker lying face down. He is unconscious but breathing normally.

Action:

1. Do not roll the person unless you suspect breathing may stop or fluids are blocking the airway.
2. Keep checking breathing every 2 minutes until emergency help arrives.
3. If breathing stops, carefully roll them onto their back and start CPR.

Key Reminder: Always protect the airway first, move the person only when safe, and continuously monitor breathing until trained help arrives.

Case Scenario: During her shift at a warehouse, Maria hears a loud crash and sees a coworker lying near a fallen ladder. She starts to run over but stops herself — remembering her scene safety training.

She quickly looks around and notices:

- A wet floor where the ladder slipped.
- Loose electrical cords nearby.

Maria moves carefully, switches off the power to the area, and places a caution cone before approaching the coworker. Once the scene is safe, she checks for responsiveness and calls for help.

"A few seconds to assess the scene can prevent another injury — including your own."

Chapter 3: CPR & AED

LEARNING OBJECTIVES

By the end of this chapter, learners will be able to:

1. Recognize the indications and situations when CPR is required, including unresponsiveness, absent or abnormal breathing, and sudden collapse.
2. Identify scenarios where CPR is not indicated, including normal breathing, responsiveness, valid DNR orders, or unsafe environments.
3. Demonstrate correct one- and two-rescuer CPR techniques for adults, including chest compressions, rescue breaths, and hand placement.
4. Apply CPR procedures safely and effectively to children and infants, adapting compression depth, rate, and rescue breath ratios appropriately.
5. Operate an AED correctly, including pad placement, following voice prompts, and understanding when defibrillation is indicated.
6. Manage special situations, such as CPR for pregnant women, mouth-to-nose or stoma breathing, and compression-only CPR when rescue breaths are not possible.
7. Maintain safety and infection control, including scene assessment, use of barrier devices, and monitoring for complications like vomiting or stomach distension.

Case Scenario: *You find a person lying on the ground, unresponsive. You have already called EMS/911. The person is not breathing, or you notice occasional gasping (agonal breathing). There is no severe external bleeding. What should you do?*

FUNDAMENTALS OF CPR

When breathing stops, oxygen can no longer reach the brain and heart, causing cells to die within minutes. CPR stands for Cardiopulmonary Resuscitation. It is a lifesaving technique used when a person's heart stops beating or they stop breathing.

Purpose:

- Keeps oxygen-rich blood flowing to the brain and vital organs.
- Maintains life until professional medical help arrives.

How it works:

1. Chest Compressions – Push the chest to manually circulate blood.
2. Rescue Breaths – Give air to the lungs (if trained).
3. AED Use – An Automated External Defibrillator can restore a normal heart rhythm.

Key point:

- Quick CPR significantly increases survival — sometimes up to three times higher.
- The sooner CPR is started, the greater the chance of saving a life.
- Remember: Even hands-only CPR (just compressions) is better than doing nothing.

3.1 INDICATIONS FOR CPR

CPR should be started only when a person is unconscious and shows clear signs that their heart or breathing has stopped. If you delay, the brain starts to die within minutes, recognize the signs fast and act confidently.

1. Unresponsive and Not Breathing

This is the main indication for CPR.

- No response when you speak and tap to them.
- Chest is not rising, or the person is not breathing at all

If they are unconscious and not breathing, don't wait. After calling 911, start CPR immediately.

2. Only Gasping (Agonal Breaths)

- Sometimes a person will make strange, weak, irregular gasps.
- This is NOT normal breathing—it means the heart has likely stopped.
- If you see gasping, treat it as cardiac arrest and begin CPR.

3. Sudden Collapse

- If someone suddenly collapses and becomes unresponsive, assume cardiac arrest unless proven otherwise.

4. After Major Trauma or Medical Event With No Breathing

If the person is unresponsive and not breathing, you start CPR—cause does not matter. CPR is indicated when breathing stops due to:

- Severe injury
- Drowning
- Overdose
- Choking that progresses to unresponsiveness
- Electric shock
- Stroke or Heart attack

5. No Pulse (If You are trained to check)

- If there is no pulse and you are trained to check, start CPR immediately.

Remember:

- Begin CPR immediately if the person is unresponsive and not breathing or only gasping.
- If the person is unconscious, not breathing, but has a pulse, give rescue breaths.
    - Give 1 breath every 5 seconds for an adult, and 1 breath every 3 seconds for a child or infant.
    - After 2 minutes, check the pulse again. If you cannot feel a pulse within 10 seconds, begin CPR with 30 compressions and 2 breaths.

You are not hurting them—if their heart has stopped, CPR is their only chance but remember that not every unconscious person needs CPR

Clear Rule to Remember

If the person is:

- Unresponsive
- Not breathing normally

Start CPR immediately. You are not "hurting" them—if their heart has stopped, CPR is the only chance they have. Not every unconscious person requires CPR. CPR is only needed if the person is unconscious, not breathing or only agonal (gasping) breaths.

SIGNS CPR IS NOT INDICATED

CPR should not be started when there is a clear reason that CPR is not appropriate. These situations are important to recognize so you don't put yourself at risk.

1. The Person Is Breathing Normally

If the person:

- Has regular, normal breathing
- Has chest movement
- Is able to speak or cry

2. The Person Is Responsive

If the person opens their eyes or has eye movement, responds to voice or touch that means person is Responsive

3. You Can Clearly Feel a Pulse (if trained)

If you are trained and you feel a pulse within 10 seconds. Assist breathing if needed, but do not start compressions.

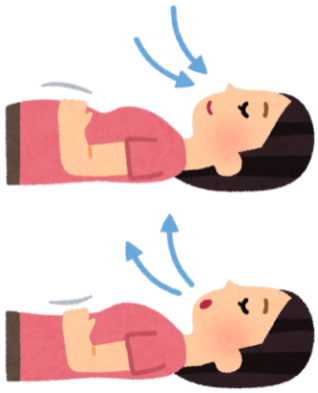
5. A Valid "Do Not Resuscitate" (DNR) Order

If there is a legal DNR, or medical direction not to perform CPR: Respect the order.

6. You Cannot Safely Reach the Person

If the environment is too dangerous (fire, toxic gas, structural collapse):

- Do NOT perform CPR until the scene is safe.
- Your safety always comes first.



3.2 CPR STEPS AND TECHNIQUES FOR ADULTS

ONE RESCUER CPR FOR ADULT

Follow the following steps when one trained first aider is present:

Step 1: Ensure Scene Safety

- Check the scene for safety.
- Take personal safety precautions.
- Assess the person's responsiveness.
- Obtain consent before providing care.
- Call EMS/911 for emergency assistance and put Phone aside on Loudspeaker and get an AED if available.

Step 2: Check Breathing

- Look at the chest to see if it rises and falls with each breath.
- Listen for breath sounds near the mouth and nose.
- Feel for air on your cheek for no more than 10 seconds.
- If the person is breathing normally, keep monitoring them.
- If they are not breathing or only gasping, start CPR immediately.

Step 3: Perform Chest Compressions

Hand Placement:

- Kneel beside the person's chest and expose the chest.
- Find the lower tip of the breastbone (where the ribs meet) using your fingers, and place two fingers on that point.
- Position the heel of one hand in the center of the chest, just above your fingers.
- Place your other hand on top and interlace the fingers.
- Keep your arms straight and your shoulders directly above your hands.

Performing Compressions:

- Using the weight of your upper body, push the chest straight down at least 5 cm (2 inches)—this counts as one compression.
- After each compression, allow the chest to fully recoil while keeping your hands in contact with the chest.
- Maintain a steady rhythm: 30 compressions in 15–18 seconds (about 100–120 per minute).

Tip: "Push hard, push fast."

Step 4: Give Rescue Breaths

Rescue breaths supply oxygen to the lungs and help keep the brain and heart alive until normal breathing resumes or emergency help arrives.

Prepare and Position the Pocket Mask:

- Place the narrow end of the mask over the bridge of the person's nose, and the wider end over the chin and jawline.
- With the hand closest to the forehead, use your index finger and thumb along the upper edge of the mask to apply gentle downward pressure and form an airtight seal.
- With your other hand, place your thumb and fingers along the bony part of the chin. Lift the chin upward using the head-tilt/chin-lift technique to open the airway while maintaining the mask seal.
- If a mask is not immediately available, start chest compressions right away.

Giving Rescue Breaths:

- Take a normal breath and blow into the mask's mouthpiece.
- Deliver each breath slowly over 1 second.
- Watch the chest: stop blowing as soon as it rises.
- Allow the air to escape before giving the second breath after a brief pause.
- Each breath should be gentle—just enough to make the chest rise, not forceful.

If the Chest Does Not Rise:

- Allow the head to return to normal, repeat the head-tilt/chin-lift, and give another breath.
- If the chest rises on the second breath, this indicates cardiac arrest—start chest compressions immediately.
- Continue the cycle of 30 compressions + 2 breaths (30:2).

TWO-RESCUER CPR FOR ADULT

When two trained rescuers are present. This method allows more effective compressions and rescue breaths.

Roles:

- Rescuer 1: Performs chest compressions.
- Rescuer 2: Manages airway, gives rescue breaths, and operates the AED.
- Switch roles every 2 minutes to avoid fatigue and maintain high-quality compressions.

Steps:

1. Ensure Safety and Call EMS

- Before providing care in any emergency, always check the scene for safety, take personal precautions, assess responsiveness, obtain consent, and call EMS/ 911. Rescuer 2 checks responsiveness and breathing, calls EMS, and gets the AED.

2. Rescuer 1 starts Compressions

- Rescuer 1 starts chest compressions and count loudly.

3. Rescuer 2 maintains Effective Ventilation:

- Manage the airway and give rescue breaths using a pocket mask for safer, cleaner ventilation.
- Deliver 2 breaths after every 30 compressions.
- Make sure each breath:
    - Forms a good mask seal
    - Causes visible chest rise
    - Lasts about 1 second
- To reduce fatigue and maintain high-quality care, switch roles with Rescuer 2 every 2 minutes or after approximately 5 cycles of 30:2 compressions and breaths.

Important Considerations for Two-Rescuer CPR

Two-rescuer CPR provides better care because compressions and breaths can be delivered with fewer interruptions and less fatigue. The following points outline safe and effective teamwork.

1. Communication and Coordination

- Use short, clear phrases: “Ready to switch?” & “Resuming compressions.”
- Confirm actions before performing them to avoid delays or errors.
- Count compressions out loud: “1, 2, 3…” so the Rescuer 2 knows when to deliver breaths.

2. Minimize Interruptions

- Avoid unnecessary pauses in compressions—stop only for:
    - AED analysis
    - Delivering a shock
    - Quick role switching (should take < 5 seconds)

3. Safety Awareness

- Ensure the environment is safe for both rescuers.

4. Professional Conduct

- Stay calm, organized, and supportive of each other.
- Continuously re-check for breathing, pulse, or any changes in condition.

CONTINUE CPR UNTIL

Once you begin CPR, continuously give 30 chest compressions and two rescue breaths until:

1. The scene becomes unsafe.
2. An AED is ready and no one else can apply it.
3. You are too exhausted to continue.
4. The person starts breathing or moving.
5. EMS arrives and assumes care.
6. Another trained rescuer takes over: If two first aiders are available, they should take turns performing CPR to prevent fatigue. Switch roles approximately every five cycles of 30 chest compressions and 2 rescue breaths — this is about every two minutes.

Tip: Make the switch quickly and smoothly to avoid interrupting chest compressions.

IMPORTANT CPR CONSIDERATIONS

Timing Matters

- Every minute without CPR reduces survival by about 10%.
- Start CPR immediately and limit interruptions to less than 10 seconds. Interrupt only to:
    - Give rescue breaths
    - Apply or use an AED
    - Allow the AED to analyze or deliver a shock

Checking ABCs During CPR

Only recheck breathing or responsiveness if the person shows signs of improvement (moves, makes sounds, opens eyes). Otherwise, continue CPR without stopping.

Rescue Breath Volume

When the airway is open using the head-tilt/chin-lift method, give each rescue breath gently and slowly—just enough air to make the chest rise. Blowing too hard or too much air can force air into the stomach instead of the lungs. This may lead to vomiting or stomach swelling (distension), which can make CPR more difficult.

Stomach Distension

Sometimes, air accidentally enters the stomach through the food pipe during rescue breaths. This usually happens when breaths are given too quickly or with too much pressure. Do not press on the abdomen to release the air—doing so can cause the person to vomit, and vomit can enter the lungs, leading to serious complications.

If the Person Vomits During CPR

If the person vomits while you are performing CPR, it is important to act quickly:

1. Turn the person onto their side, facing you, to allow the vomit to drain out of the mouth.
2. Wipe the mouth clean, then roll the person back onto their back and continue CPR.
3. After every 30 chest compressions, look inside the mouth. If food or vomit is visible, remove it carefully with a finger sweep before giving two rescue breaths.
4. Continue checking and clearing the mouth after every cycle until it is free of vomit or debris.

Performing these steps correctly helps prevent aspiration, when vomit enters the lungs - which reduces the person's chance of survival.

3.3 SPECIAL SITUATIONS

PREGNANT WOMEN

When performing CPR on a pregnant woman, it helps to raise her right hip about 10 cm (4 inches) using a firm object such as a pillow, folded towel, or rolled-up blanket. This slight tilt helps blood flow back to her heart more effectively, improving circulation during CPR.

However, do not delay starting CPR to look for something to place under her hip. Begin CPR immediately, and if another person is available, ask them to bring a suitable object to position under the hip while you continue compressions.

MOUTH-TO-NOSE RESCUE BREATHING

Sometimes it may not be possible to give mouth-to-mouth breaths—for example, if the person's mouth is injured, swollen, or cannot be opened. In these cases, you can safely give mouth-to-nose rescue breaths instead.

Steps:

1. With one hand, tilt the head back to open the airway. With the other hand, lift the chin and gently close the person's mouth.
2. If you are using a face shield or mask, place it securely over the person's nose.
3. Take a normal breath, seal your mouth over the person's nostrils, and blow air slowly into their nose.
4. Watch for the chest to rise—this means air is entering the lungs.

MOUTH-TO-STOMA RESCUE BREATHING

Some people breathe through a stoma, a small permanent opening in the neck created by surgery. In this case, air must be given directly into the stoma.

Steps:

1. Remove any clothing or objects, such as scarves or ties, that cover the stoma.
2. Do not tilt the head or lift the chin. Instead, use your fingers to close the mouth and nose to prevent air from escaping.
3. Place a face shield or mask over the stoma, take a normal breath, and seal your mouth around the opening.
4. Blow air slowly into the stoma until you see the chest rise.

COMPRESSION-ONLY CPR

In some emergencies, it may be difficult or unsafe to give mouth-to-mouth breaths — for example, if you don't have a CPR mask or if the person has serious facial injuries. In these situations, you can perform Compression-Only CPR (also called Hands-Only CPR).

In Compression-Only CPR, you give continuous chest compressions at a rate of 100 to 120 compressions per minute, without pausing to give rescue breaths.

Remember:

- Compression-Only CPR is always better than doing nothing. It keeps blood moving to the brain and heart until professional help arrives.
- If the person's cardiac arrest is caused by a breathing problem (such as choking, asthma, or drowning), their blood may already have low oxygen. In these cases, full CPR with rescue breaths is needed to give them the best chance of survival.
- Do not use Compression-Only CPR on children or infants. Their smaller lungs and faster oxygen use mean they need both chest compressions and rescue breaths.

Key Takeaway

CPR is not just a skill — it is the bridge between life and death. Act quickly, stay calm

"Push hard, push fast, and don't give up until help arrives."

3.4 AED (AUTOMATED EXTERNAL DEFIBRILLATOR)

UNDERSTANDING AED

An AED is a small, portable electronic machine that helps restart a person's heart when it suddenly stops beating — this is called cardiac arrest.

When someone has a cardiac arrest, their heart stops pumping blood properly. The AED checks (analyzes) the heart rhythm and, if needed, gives an electric shock to help the heart start beating normally again.

AEDs are safe and very simple to use. They are made for everyday people, not just doctors or nurses. Firefighters, police officers, teachers, lifeguards, parents, and even bystanders can all use an AED to save a life.

INDICATIONS FOR USING AN AED

An Automated External Defibrillator (AED) is used to check a person's heart rhythm and, if needed, give a shock to help the heart start beating normally again. First aider must know exactly when to apply an AED.

1. The Person Is Unresponsive

An AED is indicated when:

- The person does not respond to voice or touch
- The person appears unconscious

If someone can talk, move, or follow commands → AED is not needed.

2. The Person Is Not Breathing Normally

Use an AED when:

- There is no breathing, or
- The breathing is not normal (gasping, agonal breaths)

Normal breathing = Do NOT use an AED.

3. The Person Has No Signs of Circulation

If the person:

- Has no pulse (for trained responders), or
- Shows no movement or signs of life
- Attach the AED as soon as possible.

4. Cardiac Arrest Is Suspected

An AED is indicated anytime you suspect the heart has stopped suddenly, including:

- Sudden collapse
- Sudden unresponsiveness during activity
- Chest pain followed by collapse
- Collapse during sports

Remember: If in doubt, treat as cardiac arrest and apply the AED.

5. The Environment Is Safe

You can use an AED when:

- The scene is safe (no fire, active electricity, unsafe water)
- The person is dry or can be dried quickly
- The chest is bare and accessible

If unsafe → move the person if possible, then apply the AED.

Key Principle for Learners

If the person is unresponsive AND not breathing normally → get the AED and use it immediately. Early defibrillation saves lives.

STEP-BY-STEP GUIDE TO USING AN AED

Step 1: Turn on the AED

1. Place the AED on the ground near the person's head — stay on the same side where you are sitting or kneeling.
2. Press the "ON" button. Some AEDs turn on automatically when you open the lid.
3. The AED will start giving you clear voice instructions. Listen carefully and follow each step.

Step 2: Prepare the Person

1. Expose the chest: Cut or remove clothing from the chest using the scissors from the AED kit.
2. Remove jewelry or objects: Clear the chest area of anything that might touch the AED pads.
3. Dry the chest: If the chest is wet, use a towel to dry it. Pads stick best on dry skin.
4. Chest hair: If the person has thick chest hair, quickly shave the pad area using the razor from the AED kit.
5. Medication patches: If there's a patch (like nitroglycerin), remove it. The electric shock can push medicine into the body through the patch, which is unsafe.

Step 3: Attach the AED Pads

1. Use adult pads for anyone aged 8 years or older.
2. Do not use child pads on adults — they won't deliver enough power.
3. Pacemaker check: Look for a small lump under the skin near the collarbone — this means the person has a pacemaker. Place the pad 1 inch (2.5 cm) away from it.
4. Pad placement:
   i One pad goes on the upper right chest, just below the collarbone.
   ii The second pad goes on the lower left side, below the nipple.
5. Connect the pads to the AED if not already connected.

Step 4: Follow the AED Prompts

All AEDs guide you through the process. Some speak aloud (voice prompts); others also show messages on the screen.

1. Analyzing heart rhythm:

- The AED will say: "Analyzing heart rhythm — do not touch the person."
- Make sure no one touches the person. Say aloud, "Clear!"

2. Charging:

- The AED may take a few seconds to charge before delivering a shock.

3. If AED says: "Shock advised"

- Make sure no one is touching the person.
- Press the flashing "Shock" button.
- The person may jerk slightly when the shock is given — this is normal.
- After the shock, immediately start CPR — begin with chest compressions.
- After 2 minutes of CPR, the AED will re-analyze the heart rhythm.

4. If AED says: "No shock advised"

- This means the AED did not find a rhythm that needs a shock.
- Continue CPR immediately, starting with chest compressions.

If a shock is delivered, immediately resume chest compressions; continue CPR for approximately 2 minutes before the AED re-analyzes."

IF YOU SEE SIGNS OF LIFE

If the person starts breathing or moving:

1. Stop CPR and check the ABCs (Airway, Breathing, Circulation).
2. If breathing is normal, place the person in the recovery position (on their side).
3. Keep the AED pads on and attached — some AEDs continue to monitor the heart.
4. Keep checking breathing and signs of shock every 2 minutes until help arrives.
5. If breathing stops again, restart CPR and follow the AED's directions.
6. When EMS (paramedics) arrive, tell them how many shocks were given.

IMPORTANT SAFETY NOTES ABOUT AED USE

- Faulty AED: If the AED stops working, continue CPR until EMS arrives.
- Metal surfaces: Safe to use an AED if pads aren't touching the metal (e.g., on bleachers or a stretcher).
- Pregnant women: AEDs are safe to use.
- Water: If the person is in water, move them to a dry area first.
- Weather: AEDs work on ice or snow.
- Flammable materials: Never use an AED near gasoline or flammable liquids.
- Moving vehicle: Do not use an AED while in a moving car or ambulance — the motion interferes with rhythm checks.
- Finding an AED: If one is nearby, grab it quickly. If not, don't waste time — start CPR right away.

AED AWARENESS & EQUIPMENT INSPECTION

1. Visual Inspection

Before use, always check:

- Pads and cables: Ensure they are connected and not damaged.
- Device condition: Look for cracks, corrosion, or loose parts.
- Battery status: Check battery charge or expiration date. Most AEDs have a display or indicator light showing readiness.
- Expiration dates: Pads and batteries have expiry dates—replace if expired.

2. Routine Awareness

- Confirm AED is in the designated location.
- Ensure it is easily accessible and not blocked by objects.
- Check the indicator light or status screen—most devices show a green "ready" signal.
- Verify emergency instructions or stickers are visible and legible.

3. After Use

- Replace used pads and batteries immediately.
- Clean the device according to manufacturer instructions.
- Report any malfunction to the responsible authority.

4. Environmental Awareness

- Keep AED in a dry, safe location.
- Avoid extreme temperatures or exposure to water.
- Ensure staff and learners know the location of each AED.

5. Key Principles

- AEDs save lives only if they work.
- Regular inspection prevents device failure during emergencies.
- All first aid responders should know how to check, access, and operate the AED safely.

3.5 CPR FOR CHILDREN

ONE RESCUER CPR FOR CHILDREN (1 YEAR – PUBERTY)

Step 1: Ensure Scene Safety

- Check the scene for safety.
- Take personal safety precautions.
- Assess child's responsiveness. Tap the child gently and shout their name. Look for any signs of normal movement, breathing, or crying
- Obtain consent from parent before providing care. If Child is alone, consent is implied.
- Call EMS/911 for emergency assistance.

Step 2: Check Breathing

- Look at the chest to see if it rises and falls with each breath.
- Listen for breath sounds near the mouth and nose.
- Feel for air on your cheek for no more than 10 seconds.
- If the person is breathing normally, keep monitoring them.
- If they are not breathing or only gasping, start CPR immediately.

Step 3: Perform Chest Compressions

Hand Placement:

- Use the heel of one hand placed on the center of the chest, specifically on the lower half of the sternum (breastbone).
- If the child is larger or you need more strength, you can use both hands, one on top of the other, just like in adult CPR.
- Avoid placing your hands on the tip of the sternum or the ribs, as this can cause injury.

Performing Compressions:

- Depth: Compress the chest to about 1/3 of its depth, which is roughly 5 cm (2 inches). This ensures enough pressure to circulate blood without causing unnecessary harm.
- Rate: Perform compressions at 100–120 per minute—a steady and continuous rhythm is essential.
- Technique:
    - Keep your arms straight and use the weight of your upper body rather than just your arms.
    - Allow the chest to fully recoil after each compression—this helps the heart refill with blood.
    - Maintain minimal interruptions between compressions to keep blood circulating.

Step 4: Give Rescue Breaths

Rescue breaths provide oxygen to the child's lungs and help keep the brain and heart alive until normal breathing resumes or emergency help arrives.

Technique Without a Mask (Mouth-to-Mouth):

1. Open the airway using the head-tilt/chin-lift method.
2. Pinch the child's nose and cover their mouth with yours to form a seal.
3. Give 2 gentle breaths, each lasting about 1 second, just enough to make the chest rise visibly.
4. Watch the chest rise with each breath to confirm that air is entering the lungs.

Technique Using a Pocket Mask:

1. Place the mask over the child's nose and mouth, ensuring it covers both completely.
2. Hold the mask firmly to create a good seal.
3. Tilt the head slightly using the head-tilt/chin-lift technique to open the airway.
4. Take a normal breath and blow gently into the mask for about 1 second, enough to see the chest rise.
5. If the chest does not rise, readjust the head and mask and try again.

Technique Using a Face Shield:

1. Place the face shield over the child's mouth and nose.
2. Seal your lips over both the mouth and nose.
3. Give 2 gentle breaths, watching for chest rise with each breath.

Key Points:

- Each breath should be gentle, not forceful, to avoid damaging the lungs.
- Always watch the chest rise—this confirms that air is entering the lungs.
- If the chest does not rise, recheck the head position and seal before giving another breath.

Step 5: Use AED as Soon as Available

1. Turn it on and follow the voice prompts.
2. Continue CPR until help arrives or the child shows signs of life.

Using AED pads on a child

- If the child is 8 years or older, use adult AED pads.
- If the child is under 8 years old, use child AED pads, if available.
- If you don't have child pads, it's okay to use adult pads — it's more important to use the AED than to wait for child pads.
- Some AEDs have a "child mode" switch or key — follow the AED's voice instructions to activate it.

PRACTICE SCENARIO:

Scenario 1: The child is unconscious but breathing

If a child is unresponsive but still breathing, and there are no signs of severe bleeding:

- Place the child in the recovery position to keep their airway open.
- Then, go and call EMS (911) and return to stay with the child until help arrives.

Scenario 2: The child is unconscious and not breathing

If a child is unresponsive and not breathing, and no one else is around to help:

1. Check the ABCs (Airway, Breathing, Circulation). If there is no breathing, start CPR immediately.
2. Give 2 minutes of CPR — that's about 5 cycles of 30 chest compressions and 2 breaths.
3. After 2 minutes, leave briefly to call EMS (911) and get an AED if available.
4. Return to the child, recheck breathing, and continue CPR until:

- The child starts breathing,
- EMS arrives, or
- You are too exhausted to continue.

TWO RESCUER CPR FOR CHILDREN (1 YEAR – PUBERTY)

Two-rescuer CPR allows for more effective compressions and rescue breaths, with fewer interruptions and less fatigue.

Roles:

- Rescuer 1: Performs chest compressions.
- Rescuer 2: Manages the airway, gives rescue breaths, and operates the AED if available.
- Switch roles every 2 minutes or after about 5 cycles of 15:2 compressions and breaths.

Steps:

1. Ensure Safety and Call EMS

- Before providing care in any emergency, always check the scene for safety, take personal precautions, assess responsiveness, obtain consent, and call EMS/ 911. Rescuer 2 checks responsiveness and breathing, calls EMS, and gets the AED.

2. Rescuer 1 starts Compressions

- Rescuer 1 starts chest compressions and count loudly.

3. Rescuer 2 maintains Effective Ventilation:

- Manage the airway and give rescue breaths using a pocket mask for safer, cleaner ventilation.
- Deliver 2 breaths after every 15 compressions.
- Make sure each breath:
    - Forms a good mask seal
    - Causes visible chest rise
    - Lasts about 1 second

4. To reduce fatigue and maintain high-quality care, switch roles with Rescuer 2 every 2 minutes or after approximately 5 cycles of 15:2 compressions and breaths.

Key Points:

- Minimize interruptions between compressions.
- Watch the chest rise during each breath to confirm effective ventilation.
- Continue CPR until the child starts breathing normally, emergency help arrives, or rescuers are too exhausted to continue.

3.6 CPR FOR INFANTS (UNDER 1 YEAR OLD)

UNDERSTANDING INFANTS

An infant is a baby younger than one year old. In medical language, a newborn or neonate refers to a baby up to 28 days after birth.

Infants are small and delicate. In an emergency, they need quick and gentle care. Even a few seconds can make a big difference.

ONE RESCUER CPR STEPS

Step 1: Ensure Scene Safety

Before you do anything, look around and make sure the area is safe for you and the baby.

1. Check the scene for safety.
2. Take personal safety precautions.
3. Assess baby's responsiveness, Gently try to wake the baby:
   - i Clap your hands or say loudly, "Are you okay?"
   - ii Watch if the baby moves, cries, or makes a sound.
   - iii If there is no response, tap the bottom of the baby's foot gently.
   - iv If the baby moves or cries — they are conscious. If the baby doesn't move or respond — they are unconscious.
4. Obtain consent from parent before providing care. If baby is alone, consent is implied.
5. Call EMS/911 for emergency assistance.

Step 2: Check Breathing

1. Look at the chest to see if it rises and falls with each breath.
2. Listen for breath sounds near the mouth and nose.
3. Feel for air on your cheek for no more than 10 seconds.
4. If the person is breathing normally, keep monitoring them.
5. If they are not breathing or only gasping, start CPR immediately.

Step 3: Perform Chest compressions

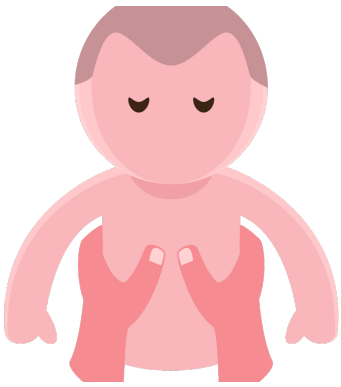
Hand Placement

1. Place the infant on a firm, flat surface.
2. Kneel beside the infant.
3. Locate the spot just below the nipple line (lower half of the sternum).
4. Use the two-thumb encircling technique: place both thumbs side by side on the compression point while your hands encircle the infant's chest for support.

Performing Compressions

1. Compress the chest about 1.5 inches (4 cm), roughly one-third of the chest depth.
2. After each compression, allow the chest to fully recoil after each compression.
3. Push hard and fast at a rate of 100–120 compressions per minute. Deliver 30 compressions.

Note: *According to recent ILCOR pediatric resuscitation updates, the preferred compression method has shifted from the two-finger technique to the two-thumb encircling technique, as evidence shows it provides better depth, consistency, and overall CPR quality in infants and small children.*



Step 4: Give Rescue Breaths

After 30 compressions, give 2 gentle breaths.

If you have a pocket mask:

1. Place the mask over the baby's nose and mouth.
2. Hold it firmly to make a seal and slightly tilt the head using the head-tilt/chin-lift method.
3. Take a normal breath and blow gently into the mask for 1 second, just enough to see the chest rise.
4. If the chest does not rise, readjust the head and try again.

If you only have a face shield:

- Place the shield over the baby's mouth and nose, then seal with your lips over both and give 2 gentle breaths.

Continue CPR Until:

- The area becomes unsafe.
- An AED (defibrillator) becomes available.
- Another trained person takes over.
- You are too tired to continue.
- The baby starts breathing or moving — then place them in the recovery position and keep checking breathing every 2 minutes.
- EMS personnel arrive to take over care.

Step 5: Use AED as soon as available

1. Use pediatric AED pads if available — they are smaller and give a gentler shock.
2. If only adult pads are available, use them — but make sure they don't touch each other and there is a gap of 2 inches between the two pads.
3. If they do, place one pad on the chest and the other on the baby's back.
4. If a shock is delivered, immediately resume chest compressions; continue CPR for approximately 2 minutes before the AED re-analyzes.

Use pediatric AED pads for children under 8 years. Use adult pads for persons 8 years and older. If pediatric pads are unavailable, apply adult pads without delay

PRACTICE SCENARIO:

Scenario 1: The baby is unconscious and not breathing

1. Start CPR right away — 5 cycles (about 2 minutes) of 15 compressions and 2 breaths.
2. After 2 minutes, go call EMS 911 and find an AED.

- If possible, carry the baby with you (if uninjured).
- Stop every 2 minutes to give CPR again until help arrives.

Scenario 2: The baby is unconscious but breathing

1. If the baby has no injuries, carry them with you to call for help.
2. After calling 911, return to the baby and keep checking for breathing every 2 minutes.
3. If breathing stops, begin CPR immediately until EMS arrives.

TWO RESCUER CPR FOR INFANT

Two-rescuer CPR allows for more effective compressions and rescue breaths, with fewer interruptions and less fatigue.

Roles:

- Rescuer 1: Performs chest compressions.
- Rescuer 2: Manages the airway, gives rescue breaths, and operates the AED if available.
- Switch roles every 2 minutes or after about 5 cycles of 15:2 compressions and breaths.

Steps:

1. Ensure Safety and Call EMS

- Before providing care in any emergency, always check the scene for safety, take personal precautions, assess responsiveness, obtain consent, and call EMS/911. Rescuer 2 checks responsiveness and breathing, calls EMS, and gets the AED.

2. Rescuer 1 starts Compressions

- Rescuer 1 starts chest compressions and count loudly.

3. Rescuer 2 maintains Effective Ventilation:

- Manage the airway and give rescue breaths using a pocket mask for safer, cleaner ventilation.
- Deliver 2 breaths after every 15 compressions.
- Make sure each breath:
    - Forms a good mask seal
    - Causes visible chest rise
    - Lasts about 1 second

4. To reduce fatigue and maintain high-quality care, switch roles with Rescuer 2 every 2 minutes or after approximately 5 cycles of 15:2 compressions and breaths.

Key Points:

- Minimize interruptions between compressions.
- Watch the chest rise during each breath to confirm effective ventilation.
- Continue CPR until the child starts breathing normally, emergency help arrives, or rescuers are too exhausted to continue.

HOW CHILD & INFANT CPR DIFFERS FROM ADULT CPR

The basic steps for CPR on a child are very similar to those for an adult. However, there are a few important differences you need to remember.

Aspect	Adult	Child	Infant
One Rescuer Ratio	30:2	30:2	30:2
Two Rescuer Ratio	30:2	15:2	15:2
Hand placement	2 hands on sternum	1 or 2 hands on sternum	2 thumbs encircling chest
Depth	5–6 cm	~5 cm	~4 cm
Technique	Two hands	Two hands	Two-thumb

Key points:

- Adults always use 30:2, whether one or two rescuers.
- Children and infants: 15:2 is recommended when two rescuers are available to provide more frequent breaths.
- Compressions should be at a rate of 100–120 per minute for all ages.

Chapter 4: Airway & Breathing Emergencies

LEARNING OBJECTIVES

By the end of this chapter, learners will be able to:

1. Explain how the respiratory system works and why a clear airway is vital for oxygen delivery in adults, children, and infants.
2. Recognize normal and abnormal breathing and the signs of partial or complete airway obstruction (choking) in all age groups.
3. Demonstrate safe first aid for breathing and choking emergencies, including back blows, abdominal or chest thrusts, CPR, and airway clearance for conscious and unconscious victims.
4. Provide first aid for respiratory conditions such as asthma, hyperventilation, COPD, and severe allergic reactions (anaphylaxis), including assisting with inhalers and EpiPens.
5. Respond appropriately when choking alone or in special situations (infants, wheelchair users), activate EMS, and continue care by monitoring ABCs until help arrives.

The respiratory system allows the body to breathe. Its main job is to bring oxygen into the body and remove carbon dioxide, which is a waste gas. Oxygen is needed for the brain, heart, and other organs to work properly. Without enough oxygen, serious injury or death can occur quickly. Major structures includes the nose, mouth, trachea, lungs, bronchi, and diaphragm. The body needs a constant supply of oxygen to survive.

A breathing emergency happens when a person cannot breathe properly due to illness, injury, allergic reactions, or a blocked airway. Air normally travels through the airway into the lungs. If the airway is blocked, even briefly, the brain and other organs do not get enough oxygen, which can quickly become life-threatening.

Airway blockage is called an obstruction. Common causes include food, small objects, vomit, saliva, or blood. The most common type of obstruction is choking, which occurs when an object gets stuck in the throat or windpipe and stops air from moving in and out of the lungs.

Choking can be of two types:

1. Partial choking – Some air can still move in and out. The person can usually cough or make sounds.
2. Complete choking – No air can pass through. The person cannot talk, cough, or breathe, and may quickly lose consciousness if not helped.

Case Scenario: *You are in a restaurant waiting for your order when you notice a young man suddenly clutch his throat and start coughing violently. He cannot speak or breathe properly. His face begins to turn red, and then slightly blue around the lips. People nearby are unsure how to help. What Would You Do?*

4.1 PARTIAL CHOKING

Partial choking happens when some air can still move in and out of the airway. The person can usually breathe a little, talk in short sentences, or make coughing or gagging sounds.

Even though the airway is not fully blocked, the person still needs help and close attention, because partial choking can quickly turn into complete choking.

FIRST AID FOR PARTIAL CHOKING (ADULTS AND CHILDREN)

- Stay calm and encourage coughing - Coughing is the body's natural way to clear the airway. Tell the person, "Keep coughing hard!"
- Do not slap the person on the back while they are coughing effectively - This can make the object move deeper into the throat.
- Watch carefully - Stay with the person and keep checking if they can still cough or breathe.
- Call EMS (911) if:
    - The person cannot cough forcefully or breathe properly.
    - The person's coughing becomes weak or they start to turn blue.
    - The airway seems completely blocked.

4.2 COMPLETE CHOKING

Complete choking is when the airway is totally blocked, and no air can get in or out.

Signs of complete choking

- The person cannot breathe, cough, or speak.
- Their skin may turn blue or very pale.
- They may look panicked and have wide-open eyes.
- They might clutch their throat with one or both hands (the universal choking sign).

Note: A person who is completely choking may be conscious or lose consciousness (become unconscious). First aid is different for a conscious person vs an unconscious person.

CONSCIOUS ADULT WITH COMPLETE CHOKING

Step 1 - Call for help (911 / EMS)

- This is life-threatening. Tell someone to call 911 and to get an AED if available.
- If you are alone, call 911 on speakerphone so you can continue giving care while talking to dispatch.

Step 2 - Give care: alternate 5 back blows and 5 abdominal thrusts

- Try five firm back blows, then five abdominal thrusts (Heimlich). Repeat this cycle until the object comes out or the person becomes unconscious.
- If the person is pregnant or too large for you to wrap your arms around their belly, use chest thrusts instead of abdominal thrusts.

HOW TO DO BACK BLOWS

1. Stand to the side and slightly behind the person. Support their chest with one hand.
2. Lean the person forward (so the object can come out of the mouth).
3. With the heel of your other hand, give five firm back blows between the shoulder blades.
4. If the object is not dislodged, move on to abdominal or chest thrusts.

HOW TO DO ABDOMINAL THRUSTS (HEIMLICH MANEUVER)

1. Stand behind the person and wrap your arms around their waist.
2. Make a fist and place the thumb side of your fist just above the belly button (below the ribcage).
3. Grasp your fist with your other hand and give five quick, upward and inward thrusts - short, forceful pulls inward toward you and up.
4. Continue alternating 5 back blows → 5 abdominal thrusts until the object comes out or the person becomes unconscious.
5. Aftercare: If the object is removed, advise the person to seek medical attention — abdominal thrusts can sometimes cause internal injury and the throat may be sore or injured.

HOW TO DO CHEST THRUSTS (FOR PREGNANT OR OBESE PERSON)

1. Stand behind the person and wrap your arms under their armpits around their chest.
2. Make a fist and place the thumb side of the fist against the lower half of the breastbone (center of chest).
3. Grasp your fist with the other hand and give five quick, forceful backward pulls (thrusts) - like a hard, inward pull.
4. Alternate 5 back blows → 5 chest thrusts until the object is removed or the person becomes unconscious.

If the person becomes unconscious

- Carefully lower them to the ground and start CPR (chest compressions and rescue breaths) if you are trained.
- Before giving breaths, look inside the mouth and remove any object you can see with a finger sweep only if you can easily and safely remove it (do not poke blindly).
- Continue CPR until EMS arrives.

Quick reminders

- Stay calm and act quickly.
- Alternate 5 back blows with 5 abdominal thrusts (or chest thrusts when needed).
- Call 911 early - even if help is on the way, keep providing care.
- After a choking event, the person should be checked by a healthcare provider.

4.3 COMPLETE CHOKING IN WHEELCHAIR

Helping a person who is choking while seated in a wheelchair can be more challenging. The method you use will depend on the type and size of the wheelchair and the person's position. Your goal is the same - to clear the object blocking the airway - but you may need to adjust how you give back blows or thrusts.

Before You Begin

- Quickly check the type of wheelchair.
    - If the chair is small or has short armrests, you may be able to reach behind for back blows or abdominal thrusts.
    - If the chair has large armrests or you cannot reach around the person, you can give frontal (from the front) abdominal or chest thrusts instead.
- Always lock the wheelchair wheels so it doesn't move during the procedure.
- Stay calm, call 911 (EMS), and get help as soon as possible.

FRONTAL ABDOMINAL THRUSTS

Use this method if you cannot reach around the back of the wheelchair.

Steps:

- Lock the wheelchair wheels so it doesn't roll.
- Stand or kneel in front of the person, adjusting to their height.
- Place the heel of one hand just above the person's belly button (navel).
- Put your other hand on top and press inward and upward with quick, firm thrusts — do this five times.
- Check the mouth after each round of thrusts. The person might not be able to spit out the object, so remove it carefully if it becomes visible and easy to reach.

FRONTAL CHEST THRUSTS

If five abdominal thrusts do not clear the blockage, switch to chest thrusts.

Steps:

1. Place the heel of one hand in the middle of the chest, on the lower half of the breastbone.
2. Place your other hand on top of the first.
3. Keeping your arms straight, give five firm, quick inward pushes toward the person's spine.
4. Check the mouth again for any visible object.
5. Keep alternating five abdominal thrusts and five chest thrusts until:

- The object is forced out, or
- The person becomes unconscious.

IF THE PERSON BECOMES UNCONSCIOUS

If the person loses consciousness while choking:

Steps:

1. Call 911 immediately (if not already done).

2. If it is safe to do so, carefully move the person from the wheelchair to the floor.

- Kneel beside them and hold the arm that is farthest from you across their chest.
- Use your other hand to grip their clothing or belt at the back.
- Gently pull them forward while guiding their head and shoulders.
- Lower them slowly to the floor, using your legs (not your back) for strength.
- Once on the ground, roll them onto their back (face-up).

3. Check for responsiveness and breathing.

- If they are not breathing, start CPR right away.
- Follow the steps for an unconscious choking person (check the airway before rescue breaths).

Safety Reminders

- Protect yourself first. Do not attempt to lift or move someone alone if it seems unsafe. Call for help.
- Always use the strength of your legs and arms, not your back, to avoid injury.
- Even if the object comes out and the person seems fine, they should still be checked by a healthcare professional.

4.4 CHOKING WHEN ALONE

If you are choking and no one is around to help, you must act fast to save yourself. Even though it's frightening, stay as calm as you can and follow these steps:

COMPLETE CHOKING WHEN ALONE

Step 1: Call for help (911)

- Dial 911 immediately.
- If you cannot speak, leave the phone line open.
- The emergency dispatcher can listen, track your call, and send help to your location.

Step 2: Get attention and make it easier for help to reach you

- If you can, unlock your main door so rescuers can get inside.
- Try to move toward a doorway, window, or an open area where you might be seen.
- If you see someone nearby, wave your arms or make noise to get their attention.
- If there's no one around, go back inside and leave the door open for EMS.

Step 3: Perform self-abdominal thrusts

If you are still choking and cannot breathe or cough, try to dislodge the object yourself.

- Option 1 – Use a firm surface
    - Stand and lean over the back of a chair, table edge, or countertop.
    - Position the edge right above your belly button (navel).
    - Push your upper abdomen firmly against the edge with a quick, strong inward and upward motion.
    - Repeat several times until the object comes out or you can breathe, cough, or speak again.
    - If the surface is sharp, place a folded cloth over the edge to protect your skin.
- Option 2 – Use your hands
    - Make a fist and place the thumb side just above your belly button.
    - Grab your fist with your other hand.
    - Press hard inward and upward into your abdomen in quick thrusts.
    - Continue until the airway clears and you can breathe again.

Note on chest thrusts

If you cannot perform abdominal thrusts, for example, due to pregnancy or abdominal injury, you can use chest thrusts instead.

- Place the heel of your hand in the middle of your chest (lower half of the breastbone).
- Push sharply straight inward several times until the obstruction clears. Although chest thrusts may not be as strong as abdominal thrusts, they can still help when no other option is safe.

After the object is out

Even if you feel fine afterward, see a healthcare provider as soon as possible. The choking or the thrusts can cause bruising or internal injuries, and you may need medical evaluation.

PARTIAL CHOKING WHEN ALONE

- Try to keep coughing - Strong, forceful coughing may push the object out.
- If coughing doesn't help:
    - Dial 911 if you can.
    - You can also press your upper abdomen quickly and firmly against the back of a chair, table edge, or countertop to try to dislodge the object.
    - Keep trying until the object comes out or help arrives.

4.5 ADULT COMPLETE CHOKING – UNCONSCIOUS

If a choking person becomes unresponsive (loses consciousness), you must start CPR right away. The goal is to keep blood and oxygen moving through the body and to try to clear the airway during compressions.

STEPS TO FOLLOW

Step 1: Lower the person to the ground

- Carefully support the person's head and neck and gently lower them onto their back on a firm surface.
- Make sure the person is lying flat on their back.

Step 2: Call for help

- If someone is with you, ask them to call 911 and bring an AED (automated external defibrillator) if available.
- If you are alone, call 911 first using your phone on speaker so you can continue care while talking to dispatch.

Step 3: Begin CPR immediately

- Start with 30 chest compressions in the center of the chest.
- Place one hand on top of the other and push hard and fast — at least 2 inches deep, about 100–120 times per minute.
- Let the chest rise fully between compressions.

Remember: Push hard, push fast!

Step 4: Check the mouth

- After 30 compressions, open the airway (tilt the head back and lift the chin).
- Look inside the mouth — if you can clearly see an object, carefully remove it with your fingers.
- Do not do blind finger sweeps. If you cannot see anything, don't reach in — this can push the object deeper and cause more harm.

Step 5: Try to give a rescue breath

- Pinch the person's nose shut and make a seal over their mouth.
- Give one breath lasting about 1 second.
- Watch for chest rise.

If the chest doesn't rise, reposition the head (tilt the head back, lift the chin again) and try a second breath.

Step 6: If air goes in

- Continue with 30 chest compressions, then look in the mouth again after each set before giving breaths.

Step 7: If air does not go in

- Continue the cycle:
  - 30 compressions → check mouth → 2 rescue breaths
  - Repeat until the airway clears, the person starts breathing on their own, or EMS arrives.

Step 8: If an AED arrives

- Turn it on and follow the voice instructions.
- Continue CPR until the AED tells you to stop or emergency responders take over.

CAUTIONS AND KEY REMINDERS

1. Never give back blows, abdominal thrusts, or chest thrusts for someone who has partial choking (they can still cough or breathe).
   These methods only work when the airway is completely blocked.
2. If the choking is caused by swelling, allergic reaction, or injury, these thrusts will not help — call 911 immediately.
3. Never put your fingers in the mouth of a conscious person — this can cause injury or make the obstruction worse.
4. In an unconscious person, only perform a finger sweep if you can clearly see a foreign object in the mouth.
5. Continue CPR until the person breathes on their own or help arrives.

UNCONSCIOUS ADULT – UNKNOWN CAUSE

Case Scenario: *You find an unconscious adult lying on the street. You call 911 (EMS) for help. You check for breathing and major bleeding, there's no breathing, but no heavy bleeding either. You begin CPR and try to give the first rescue breath. The chest doesn't rise. You try again after repositioning the head (head tilt–chin lift), but the chest still does not rise.*

This could mean that the airway is blocked — the person may be choking. What to Do ?

Step 1: Suspect choking

- If the chest doesn't rise after two rescue breaths, assume the airway is blocked.

Step 2: Start chest compressions

- Begin CPR again with 30 chest compressions in the middle of the chest.
- Push hard and fast (about 2 inches deep, 100–120 times per minute).

Step 3: Check the mouth after compressions

- After 30 compressions, open the airway and look inside the mouth.
- If you see an object, carefully remove it.
    - Hold the lower jaw and tongue with one hand to open the mouth.
    - With the other hand, insert a finger along the inside of the cheek and gently scoop behind the object to remove it.
    - Do not do a blind sweep if you can't see anything — this can push the object deeper.

Step 4: Try to give rescue breaths

- If the mouth looks clear, open the airway again and try to give a breath.
- Watch for the chest to rise.
    - If the chest rises, the object has been cleared — give a second rescue breath.
    - If the chest does not rise, the airway is still blocked.

Step 5: Continue the cycle

- Keep repeating the sequence:
    - 30 chest compressions → check the mouth → 2 rescue breaths.
- Always check for visible objects before giving breaths.
- Continue until:
- The person starts breathing on their own, or
- EMS personnel arrive and take over.

Key Reminders

- If the person's chest doesn't rise during rescue breaths, always suspect choking.
- Only remove an object if you can see it clearly.
- Keep providing CPR without interruption until trained help arrives.
- Even if the airway clears and the person starts breathing, they should still be checked by medical professionals.

4.6 CHILD CHOKING

Children are at a higher risk of choking than adults because their airways are much smaller, about the width of their little finger. This means even a small object or piece of food can block their breathing. Acting quickly and calmly can save their life.

CONSCIOUS CHILD – PARTIAL CHOKING

If a child is coughing, crying, or speaking, air is still moving through their airway.

- Encourage them to keep coughing. Coughing is the body's natural way to clear the airway.
- Do not hit their back or give abdominal thrusts while they are coughing effectively.
- Stay close and watch carefully in case the choking becomes complete.

If the child cannot cough strongly, starts to gasp or make high-pitched sounds, or cannot speak, treat it as complete choking and take action right away.

CONSCIOUS CHILD – COMPLETE CHOKING

The first aid steps are similar to those for an adult, but remember that a child is smaller, so you'll need to adjust your position and strength.

Step 1: Call 911 (EMS) or ask someone nearby to call.

Step 2: Adjust to the child's height — kneel, bend down, or sit so you can work safely and comfortably.

Step 3: Support the child by placing one arm across their chest and help them lean forward so their upper body is almost parallel to the ground.

Step 4: Using the heel of your hand, give up to five firm back blows between the child's shoulder blades.

Step 5: If the object is not cleared, kneel or stand behind the child and give abdominal thrusts (Heimlich maneuver):

- Make a fist and place it just above the child's belly button.
- Grasp your fist with your other hand and pull inward and upward sharply.
- Do five thrusts.

Step 6:

- Continue to give five back blows, then five abdominal thrusts, over and over until:
- The object comes out, or
- The child becomes unresponsive (unconscious).

Step 7:

- If the blockage is cleared, stay with the child and have them checked by a doctor. Abdominal thrusts can sometimes cause internal or throat injuries, and the doctor needs to ensure they are safe.

UNCONSCIOUS CHILD – COMPLETE CHOKING

If the child becomes unconscious, follow these steps:

Step 1: Carefully lay the child on a flat, firm surface. Make sure EMS has been called (if not, call immediately).

Step 2: Check for consciousness, breathing, and major bleeding (ABCs).

Step 3: If the child is not breathing, start CPR right away.

- Give 30 chest compressions in the center of the chest.
- After compressions, open the mouth and look inside.
- If you see an object, gently remove it.
- Never do a blind finger sweep — only remove something you can clearly see.

Step 4: If the mouth looks clear, open the airway and try to give two rescue breaths.

- If the chest rises, continue CPR as normal (30 compressions, 2 breaths).
- If the chest does not rise, the airway may still be blocked — return to compressions and repeat the cycle.

Keep doing 30 compressions → check mouth → 2 rescue breaths until:

- The child starts to breathe, or
- Trained medical help arrives.

Important Safety Tips

- Always stay calm and act fast. Never give back blows or thrusts if the child is still coughing effectively.
- If the child starts breathing again but seems weak, keep them still and calm while waiting for help. After any choking incident, a medical check-up is essential, even if the child looks fine.

4.7 CHOKING IN INFANTS (UNDER 1 YEAR OLD)

Infants are very vulnerable to choking because their airways are tiny.
Signs of choking in an infant include:

- Sudden trouble breathing
- Coughing or gagging
- Noisy or high-pitched breathing

Important: Do not perform abdominal thrusts on an infant. This can cause serious injuries to the liver, stomach, or other organs. Instead, use a combination of back blows and chest thrusts.

CONSCIOUS INFANT – PARTIAL CHOKING

If the infant is coughing or gagging, it means air is still moving.

- Do not interfere. Let the baby try to clear the object by coughing.
- Watch closely. If the infant starts making high-pitched noises, struggles to breathe, or becomes too weak to cough, call 911 immediately.
- If you are alone, call EMS 911 and shout for help.
- Be ready to act if the infant stops coughing or becomes unresponsive.

CONSCIOUS INFANT – COMPLETE CHOKING

If the infant is turning blue or cannot breathe effectively:

Step 1 – Position the infant

- Sit on the floor, resting the infant across your forearm with their head lower than their chest.
- Support the head and jaw with your hand.
- Rest your forearm on your thigh for added stability.

Step 2 – Give back blows

- With the heel of your other hand, give five firm back blows between the shoulder blades.

Step 3 – Turn for chest thrusts

- Carefully roll the infant onto their back, keeping their head lower than the chest.
- Support the head and neck with one hand, and place your forearm along their body, resting on your thigh.

Step 4 – Give chest thrusts

- Place two fingers on the breastbone just below the nipple line.
- Give five quick, firm chest thrusts.

Step 5 – Repeat

- Alternate five back blows → five chest thrusts until:
  - The object is removed,
  - The infant becomes unconscious, or
  - EMS arrives to take over.

UNCONSCIOUS INFANT – CHOKING

If the infant becomes unresponsive:

Step 1 – Lay the infant flat

- Place the infant on a firm, flat surface.
- Ensure EMS has been called.

Step 2 – Start CPR

- Begin 30 chest compressions.
- After compressions, check the mouth for visible objects and remove them if seen.
- Give two rescue breaths if the airway looks clear.

Step 3 – Continue cycles

- Keep repeating 30 compressions → check mouth → 2 breaths until:
- The infant begins breathing, or
- Help arrives.

IMPORTANT SAFETY TIPS

- Never perform abdominal thrusts on an infant.
- Never do a finger sweep on a conscious infant.
- Only do a finger sweep in an unconscious infant if you can clearly see a foreign object in the mouth.
- Always call EMS immediately if the infant is choking or becomes unresponsive.

4.8 RESPIRATORY EMERGENCIES

NORMAL BREATHING:

- Air moves in and out easily and quietly.
- You can barely hear someone breathe when they are calm or resting.

Normal resting breathing rates:

Note: *If a person is breathing faster or slower than these numbers, or if they seem to be struggling to breathe, it may be a sign of a breathing emergency. Get help right away.*

ABNORMAL BREATHING:

When breathing is not normal, you may notice:

- Wheezing, gurgling, or high-pitched sounds when they breathe.
- Breathing looks hard or strained.
- The person may be using extra muscles to breathe (for example, you can see their chest or neck working hard).

Abnormal breathing can be caused by asthma, lung infections, heart problems, or a blocked airway.

TYPES OF RESPIRATORY EMERGENCIES

There are two main types of breathing emergencies:

1. Respiratory Difficulty

- The person can still breathe but is having trouble taking normal breaths.
- Breathing may be too fast, too slow, shallow, or noisy.
- They might feel tired, anxious, or scared because it's hard to breathe.
- These people usually need medicine (like an inhaler or other prescribed treatment) to help them breathe better.

2. Respiratory Arrest

- The person has stopped breathing completely or is only gasping for air.
- This is a life-threatening emergency.
- Start CPR immediately and call 911 (EMS) for help right away.

4.9 RESPIRATORY DIFFICULTY

Causes of respiratory difficulty may include:

- Chest or head injuries
- Lung diseases (asthma, pneumonia, COPD)
- Heart problems (heart attack, heart failure)
- Allergic reactions
- Stroke
- Carbon monoxide exposure
- Insect stings or bites

SIGNS AND SYMPTOMS

You can recognize respiratory difficulty by observing the following:

- Shortness of breath or labored breathing
- Trouble speaking in full sentences
- Breathing that is unusually deep or shallow
- Breathing rate that is too fast or too slow

HELPING WITH MEDICATION

Sometimes a person with respiratory difficulty may need help taking their prescribed medication. As a first aider, you can assist only if it is safe:

1. The person is fully conscious and able to understand the risks.
2. The person requests your help with medication, such as:
   i Inhalers (for asthma)
   ii EpiPen (for severe allergic reactions)
   iii Aspirin (for heart issues, if prescribed)
3. The person carries their own medication.
4. You can safely assist without risk of choking or injury.

Important:

- Never give medication that belongs to someone else.
- Never force medication if the person is unconscious or unable to swallow safely.

4.10 ASTHMA

Asthma is a condition that affects the airways, the tubes that carry air in and out of the lungs. In people with asthma, these airways are very sensitive. When they come in contact with certain things (like dust, smoke, or cold air), the airways become swollen and tight. This makes it hard for air to move in and out of the lungs, so the person has trouble breathing. This breathing problem is called an asthma attack.

Asthma is usually controlled by medication, such as an inhaler, which helps open up the airways and makes breathing easier. With the right care, most people with asthma can live normal, active lives.

SIGNS OF AN ASTHMA ATTACK

- Wheezing or persistent coughing
- Shortness of breath
- Gasping for air
- Rapid or shallow breathing
- Chest tightness
- Cannot speak more than a few words without pausing
- Restlessness or anxiety
- Fatigue from working hard to breathe

APPROACH, ASSESS & PROVIDE CARE FOR RESPIRATORY EMERGENCIES

1. Ensure Check that the scene is safe, protect yourself, assess responsiveness, obtain consent if possible, and call EMS/911 early for serious breathing difficulty. Put the phone on speaker. Get an AED. if the person becomes unresponsive or stops breathing.
2. Remove triggers – if possible, eliminate substances causing the attack (food smells, dust, smoke).
3. Move to a safe environment – away from triggers, if possible.
4. Keep the airway open – priority is always to help the person breathe.
5. Position comfortably – usually semi-sitting or tripod position.
6. Assist the person with their own prescribed medication only if Person is Conscious (such as an inhaler or EpiPen), if requested and permitted by workplace policy, after checking the Five Rights and following training.
7. Reassure the person and encourage calm, controlled breathing.

HELPING WITH AN INHALER

Assist the person with their own prescribed asthma medication after checking the five rights of medication.

Step 1: Shake the inhaler 3–4 times.

Step 2: Remove the cap from the inhaler.

Step 3: Ask the person to breathe out fully.

Step 4: Place the inhaler in the mouth and press the top while they take a slow, deep breath.

Step 5: Ask them to hold their breath for up to 10 seconds, then breathe out slowly.

Note:

- If more doses are needed, wait 30 seconds before repeating.
- If throat irritation occurs, allow them to gargle with water.
- If the person is too tired to inhale deeply, use a spacer.

4.11 ANAPHYLACTIC SHOCK (SEVERE ALLERGIC REACTION)

Our body has a natural defense system that protects us from germs like bacteria and viruses. When a harmful substance enters the body, it is called an antigen. The body reacts by making antibodies, which help fight off that substance.

For most people, eating foods like peanuts is harmless. However, some people's immune systems see peanut protein as dangerous. When they eat peanuts, their body overreacts and releases strong chemicals, such as histamine, that cause an allergic reaction. Almost any substance can trigger an allergic reaction, but the most common causes include certain foods, insect bites, medicines, and pollen.

DEFINATION

Anaphylaxis or Anaphylactic shock is a severe, life-threatening allergic reaction that happens quickly and can affect breathing, blood pressure, and circulation. It requires immediate treatment, usually with epinephrine, and emergency medical care.

SIGNS AND SYMPTOMS

Anaphylaxis can develop within seconds or minutes:

Skin:

- Swelling of lips, tongue, face, hands, or feet
- Rash, hives, or itchy raised areas
- Watery, red, or swollen eyes
- Runny or blocked nose
- Bluish lips

Respiration:

- Coughing, chest tightness, wheezing
- Shortness of breath

Stomach:

- Nausea, vomiting, diarrhea, stomach cramps

Nervous System:

- Weakness, restlessness, or unresponsiveness

FIRST AID AND MEDICATION HELP

- Anaphylaxis is an emergency. It can be fatal.
- Call EMS 911 immediately and get an AED if available.
- If the person carries an EpiPen, assist them in using it safely.

Five Steps for Using an EpiPen

1. Remove the EpiPen from its plastic tube.
   - Hold it in the middle.
   - Orange tip points downward, blue safety cap up.
   - Remove the blue safety cap.
2. Place the tip against the outer thigh and push firmly until you hear a click.
3. Hold for 5 seconds.
4. Remove the EpiPen carefully and place it back in its plastic cover.
5. Note the time it was given and hand it to EMS personnel.

Ongoing Care After EpiPen Use

1. Help the person sit or lie comfortably.
2. Advise them not to stand quickly, as it may lower blood pressure.
3. Ensure EMS has been called after the first injection.
   - Tell them a dose has been given.
4. Some people carry two EpiPens.
   - If no improvement after 5 minutes, give the second dose in the other leg if available, and only if EMS has not arrived.
5. Provide reassurance and encourage normal breathing.
6. If the person develops shock, lay them flat on their back and monitor ABCs.
7. Start CPR if they become unconscious and stop breathing before help arrives.
8. Hand over the used EpiPen to EMS personnel.

Chapter 5: Circulatory Emergencies

LEARNING OBJECTIVES

By the end of this chapter, learners should be able to:

1. Describe the components and function of the circulatory system in maintaining oxygen and nutrient delivery.
2. Identify and differentiate between minor and major external bleeding, including recognition of warning signs.
3. Demonstrate appropriate first aid techniques for controlling external bleeding, including direct pressure and tourniquet use.
4. Recognize signs and symptoms of internal bleeding and implement immediate first aid measures to prevent shock.
5. Explain the causes, types, and physiological effects of shock on the body.
6. Apply first aid for conscious and unconscious individuals in shock, including positioning, monitoring, and EMS activation.
7. Emphasize the importance of rapid recognition, safety precautions, and timely medical intervention to improve survival outcomes.

Case Scenario: *You are walking in the parking lot outside a shopping mall when you see a man trip and fall onto a broken glass bottle. He cuts his forearm badly, and blood is flowing rapidly from the wound. He looks frightened and is holding his arm tightly, but the bleeding doesn't stop. You can see a pool of blood forming on the ground. What would you do?*

What is Circulatory System?

The circulatory system is made up of the heart, blood, and blood vessels.
Its job is to carry oxygen and nutrients to all parts of the body and remove waste products like carbon dioxide.

A circulatory emergency happens when this system is interrupted — for example, when:

- A person loses too much blood,
- The heart stops pumping properly, or
- The blood flow to vital organs like the brain or heart is blocked.

When blood flow is affected, the body's organs and tissues don't get enough oxygen. This can quickly become life-threatening.

In this chapter, we'll focus on external bleeding and how to control severe blood loss, one of the most common and critical circulatory emergencies. Other circulatory emergencies: such as heart attacks, angina, stroke, and cardiac arrest, will be covered in detail in Chapter Cardiovascular Emergencies.

5.1 MINOR EXTERNAL HEMORRHAGE (BLEEDING)

Being able to recognize different levels of external bleeding is an important skill. External hemorrhage means blood is coming out through a break in the skin.

RECOGNIZING MINOR EXTERNAL HEMORRHAGE

Minor bleeding is usually not life-threatening, but it still needs attention.

How to identify minor bleeding:

- The cut or scrape is small and shallow.
- Blood comes out slowly or oozes rather than flowing.
- The bleeding usually stops on its own with light pressure.
- Examples include paper cuts, small kitchen cuts, or scraped knees.

Minor bleeding is uncomfortable but usually easy to control. It is important to keep it clean to prevent infection.

CONTROLLING MINOR EXTERNAL HEMORRHAGE

Minor bleeding can usually be stopped with simple steps.

Key points:

- Apply gentle, direct pressure with a clean cloth or bandage.
- Clean the wound once bleeding slows or stops.
- Cover with a small bandage to protect it from dirt.
- Monitor the area for signs of infection (redness, swelling, warmth, or pus).

The goal is to stop the bleeding, clean the wound, and protect it so it can heal properly.

5.2 MAJOR EXTERNAL HEMORRAGE (BLEEDING)

Major bleeding is serious and can become life-threatening quickly if not controlled. When someone is bleeding heavily, your top priority is to stop the bleeding as quickly as possible. If bleeding is not controlled, the person can lose a lot of blood, go into shock, and even die.

How to identify major bleeding:

- Blood is flowing quickly or heavily from a wound.
- Blood may spurt out with each heartbeat (this suggests an artery is involved).
- Clothing or bandages become soaked with blood.
- The wound may be large, deep, or caused by a serious injury such as a fall, vehicle crash, or sharp object.
- The injured person may show signs of shock: pale skin, sweating, dizziness, confusion, or weakness.

What learners should understand:

Major bleeding requires urgent action. The body can only lose a certain amount of blood before vital organs stop receiving enough oxygen. Quick recognition can save a life.

Protect Yourself First

Before giving first aid:

- Put on gloves if you have them to protect yourself from blood.
- If available, wear eye protection or goggles to prevent splashes.

Two Main Ways to Stop External Bleeding

1. Direct Pressure – The first and most important step.
2. Tourniquet – Used only when bleeding is very heavy and cannot be stopped by direct pressure.

APPLYING DIRECT PRESSURE

Direct pressure means pressing firmly on the wound to help the blood clot and stop flowing.

Steps:

1. Expose the wound – Cut or move clothing away so you can see where the bleeding is coming from.

2. Cover the wound – Place a clean, absorbent cloth, gauze, or bandage directly over the bleeding area.

3. Apply firm pressure – Press hard with your hand to slow and stop the bleeding.

4. Do not remove soaked dressings.

    i If the first cloth becomes soaked with blood, put another one on top and keep pressing.

    ii Removing the first cloth can break blood clots that are starting to form.

5. Keep pressing until the bleeding stops.

    i This can take 10–15 minutes or longer, so stay calm and keep steady pressure.

6. Once bleeding stops, wrap a bandage around the wound to hold the dressing in place.

7. Check often to make sure the bleeding has not started again.

Special Note:

If the wound is on the chest, abdomen, or head, just keep firm pressure on the area — do not press too hard or insert anything into the wound.

USING A TOURNIQUET

A tourniquet is a tight band placed around an arm or leg to stop severe bleeding that cannot be controlled by pressure alone.
It works by squeezing the blood vessels tightly to stop the flow of blood to the injured area.

You can use either:

- A commercial tourniquet (professionally made), or
- An improvised tourniquet (made from materials you have nearby).

Improvised Tourniquet

Use this only for life-threatening bleeding if you don't have a commercial one.
Common materials: a triangular bandage, scarf, or piece of strong cloth. Avoid using belts — they don't get tight enough to stop arterial bleeding.

Steps:

1. Keep someone pressing on the wound while you prepare the tourniquet.
2. Fold a triangular bandage into a strip about 2 inches wide.
3. Place the strip about 5 cm (2 inches) above the wound, but never over a joint. If the wound is near a joint (like the knee or elbow), place the tourniquet above the joint.
4. Wrap the strip around the limb and tie a half knot (like the first step of tying your shoe).
5. Insert a strong object (like a stick, pen, or screwdriver handle) into the knot — this is the tightening stick.
6. Twist the stick to make it tighter.
7. Tie another knot to secure the stick so it doesn't unwind.
8. Write down the time the tourniquet was applied — this is very important for emergency responders.
9. Keep watching the wound. If bleeding starts again, tighten the tourniquet more or apply a second one below the first.

Important Notes:

- Do not remove the tourniquet once it's applied. Only trained emergency workers should do that.
- A belt does not make a good tourniquet — it's too stiff and can't be tightened enough to stop arterial bleeding.

Commercial Tourniquet

These are special medical tools designed to stop severe bleeding quickly. They are simple, safe, and very effective.
If available, always use a commercial tourniquet instead of making one.

Steps:

1. Ask someone to keep applying pressure to the wound while you prepare the tourniquet.
2. Place the tourniquet about 5 cm (2 inches) above the wound, but not over a joint.
3. Tighten the strap until the bleeding completely stops.
4. Lock or secure the handle (called a windlass) in place.
5. Write down the time the tourniquet was applied.
6. Keep checking the wound until EMS (911) arrives.

- If bleeding restarts, tighten it again.

Important Safety Reminders

1. Only use a tourniquet for life-threatening bleeding that won't stop with direct pressure.
2. Never remove a tourniquet once it's on — let medical professionals handle it.
3. Always note the time it was applied.
4. Call 911 immediately after applying direct pressure or a tourniquet.
5. Keep the injured person calm, warm, and lying down to prevent shock.

5.3 INTERNAL BLEEDING (HEMORRHAGE)

Internal hemorrhage happens when someone is bleeding inside their body. This type of bleeding is dangerous because it may not be obvious at first.

HOW TO RECOGNIZE POSSIBLE INTERNAL BLEEDING:

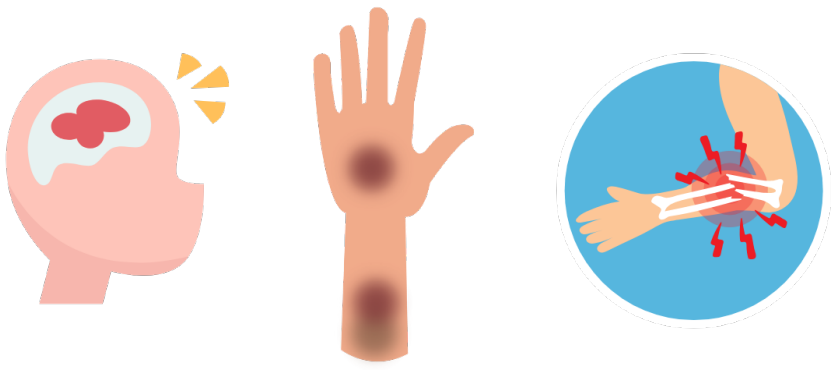
You may see:

- Pain or swelling in one area, especially after a fall or hit.
- Deep bruising that spreads or becomes very dark.
- Hardness or tightness in the abdomen (stomach area).
- Feeling weak, dizzy, or confused due to blood loss.
- Cold, pale, or sweaty skin, especially on the face.
- Rapid breathing or a fast pulse, signs the body is trying to make up for lost blood.
- Vomiting or coughing up blood, or blood in the stool or urine (in severe cases).

COMMON CAUSES OF INTERNAL BLEEDING:

- Falls or blows to the stomach or chest
- Vehicle crashes
- Major fractures (like the pelvis or thigh bone)
- Medical conditions such as ulcers or ruptured organs

Internal bleeding cannot be stopped outside the hospital. Recognizing early signs allows you to get help fast, which may save someone's life.



5. Monitor Their Condition

Keep checking:

- Breathing
- Pulse
- Skin color and temperature
- Level of alertness (if they become confused, sleepy, or unresponsive)

Be ready to act if their condition worsens.

6. Be Prepared to Give CPR

- If the person becomes unresponsive, and is not breathing normally Start CPR immediately and continue until help arrives.

7. Do Not Apply External Treatments

For internal bleeding:

- Do NOT apply pressure to the abdomen or chest
- Do NOT try to raise limbs if it causes pain
- Do NOT give medications
- Do NOT move them unless they are in immediate danger

KEY POINTS FOR LEARNERS

- Internal bleeding is invisible, but signs like dizziness, abdominal pain, deep bruising, or pale skin are important clues.
- First aid focuses on calling for help, keeping the person still, preventing shock, and monitoring them.
- Only hospitals can stop internal bleeding.

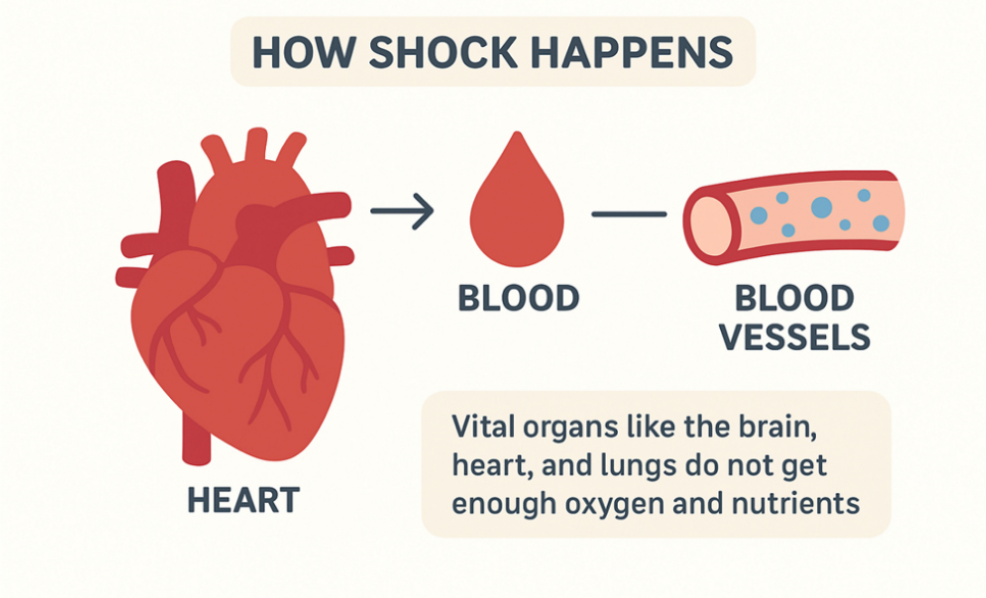
5.4 SHOCK

Shock is a serious, life-threatening condition that happens when the body's vital organs — like the brain, heart, and lungs — do not get enough oxygen and glucose (sugar) from the blood. Without oxygen, these organs can stop working properly, and the person can die if not helped quickly.

Our circulatory system has three important parts:

1. The heart – pumps blood around the body.
2. The blood – carries oxygen and nutrients.
3. The blood vessels – act like highways that deliver blood to all body parts.

If any one of these three parts fails for example, if there is too little blood, a damaged heart, or blocked vessels, the organs won't get enough oxygen. This leads to shock.



COMMON CAUSES OF SHOCK

Shock can happen for many reasons. Some of the most common include:

1. **Severe bleeding (external or internal):**
   - When someone loses too much blood, the body doesn't have enough to carry oxygen to vital organs like the brain or lungs.
   - This is one of the most common causes of shock.
2. **Heart problems:**
   - When the heart cannot pump blood properly, such as during a heart attack or cardiac arrest, blood flow to vital organs stops or slows down.
3. **Blood clots or blockages:**
   - A large clot in the blood vessels can block blood from reaching the heart, lungs, or brain.
4. **Blood vessel damage:**
   - After a head, neck, or spinal injury, the blood vessels may lose their ability to tighten.
   - As a result, blood collects in the vessels and cannot reach vital organs.
5. **Fluid loss from infections or allergic reactions:**
   - During severe infections or serious allergic reactions, fluids leak from the blood vessels into body tissues.
   - This reduces the amount of circulating blood.
6. **Dehydration or fluid loss from illness or burns:**
   - Severe vomiting or diarrhea removes a lot of fluid from the body.
   - Major burns can also cause body fluids to evaporate quickly, leading to shock.

SIGNS AND SYMPTOMS OF SHOCK

When a person is in shock, the body tries to keep blood flowing to the most important organs — the heart, brain, and lungs — by reducing blood flow to the skin, arms, legs, and abdomen. Because of this, the skin is one of the first places where you can see the signs of shock.

Skin Signs

- Pale, cold, or clammy skin (especially on the palms and soles).
- Lips and nail beds may look blue or gray.

Mental Signs

- Restless, anxious, or confused behavior.
- May feel sleepy or lose consciousness.

Breathing Signs

- Fast or shallow breathing (as the body tries to get more oxygen).

Other Signs

- Weakness or faintness.
- Nausea or vomiting.
- Feeling very thirsty.

COMMON FIRST AID FOR SHOCK

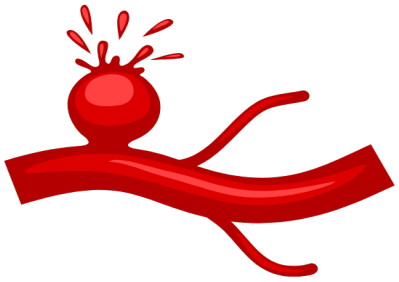
1. Prevent Shock Early

The most important rule: Prevent shock before it happens. Whenever someone is sick or injured, always think "Could this person go into shock?"

- Do not wait for symptoms to appear.
- Call 911 (EMS) immediately if you suspect someone may go into shock.
- Control any bleeding right away.

2. If the Person Is Unconscious

- Check ABC (Airway, Breathing, and Circulation)
- Call 911 (EMS) and get an AED (if available).
- If the person is breathing, place them in the recovery position (on their side) to keep the airway clear.
- Keep monitoring breathing and pulse until help arrives.
- If the person is not breathing, roll them onto their back and start CPR:
    - 30 chest compressions,
    - followed by 2 rescue breaths.
    - Continue CPR until medical help takes over.



3. If the Person Is Conscious

- Check the airway – make sure it's clear and that they can breathe easily.
- Help them lie down on their back.
    - If this isn't possible (due to back pain or injury), help them sit in a semi-sitting position.
    - If the person is pregnant:
    - Have her lie on her left side, or raise her right hip about 5 cm with a blanket or small pillow.
    - Keep them warm by lightly covering them with a blanket or jacket — but don't overheat them.
- Do not give food or drink, even water - this could cause choking or delay treatment.
- Stay calm and reassure them - panic can make shock worse.
- Keep checking their breathing, pulse, and level of alertness until EMS arrives.

Key Points to Remember

- Shock is life-threatening - act quickly.
- Always treat for shock after serious bleeding, injuries, or medical emergencies.
- Call 911 immediately for professional help.
- Keep the person warm, calm, and lying down.
- Never give them anything to eat or drink.
- Continue monitoring until help takes over.

Chapter 6: Cardiovascular Emergencies

LEARNING OBJECTIVES

By the end of this chapter, learners should be able to:

1. Describe the structure and function of the heart, blood vessels, and brain in maintaining health.
2. Recognize common cardiovascular and brain emergencies, including heart attack, angina, cardiac arrest, stroke, and TIA.
3. Identify the signs and symptoms of heart- and brain-related emergencies, including less obvious or "silent" cases.
4. Demonstrate appropriate first aid responses, including CPR, AED use, and stroke/TIA management.
5. Explain controllable and uncontrollable risk factors for cardiovascular and brain emergencies.
6. Apply prevention strategies through healthy lifestyle choices and management of medical conditions.
7. Emphasize the importance of rapid recognition and immediate EMS activation to improve outcomes.

Case Scenario*: You are standing in line at a coffee shop when the lady in front of you suddenly collapses to the floor. People around start to panic. The woman is lying motionless and does not respond when you call out to her. You notice she looks pale, and her lips have a bluish color. There is no obvious sign of bleeding, but she appears not to be breathing normally. The cashier has already called 911, What would you do?*

6.1 WHAT IS THE CARDIOVASCULAR SYSTEM?

The cardiovascular system includes the heart and blood vessels. The heart works like a pump, moving blood through the vessels. Blood carries oxygen, nutrients, and hormones to the body's cells and takes away waste products like carbon dioxide.

Common Cardiovascular Emergencies

These emergencies happen when the heart or brain blood vessels are affected. The main types are:

- Angina – Chest pain due to reduced blood flow to the heart.
- Heart Attack – Heart muscle is damaged because blood flow is blocked.
- Cardiac Arrest – Heart stops beating.
- Stroke / Transient Ischemic Attack (TIA) – Blood flow to the brain is blocked.

These problems often develop slowly over time due to risk factors, but they can appear suddenly as an emergency.

CAUSES OF CARDIOVASCULAR EMERGENCIES

There are two types of risk factors:

1. Uncontrollable Factors (you cannot change)
   i Age
   ii Gender
   iii Family history of heart disease
2. Controllable Factors (you can manage through lifestyle)
   i Unhealthy diet
   ii Physical inactivity
   iii Smoking or using tobacco
   iv Excessive alcohol use

Long-term stress can increase the risk of heart problems by raising blood pressure and affecting blood sugar. Managing stress with relaxation techniques, exercise, sleep, and social support can help protect your heart.

These lifestyle choices can lead to problems like high blood pressure, high blood sugar, high cholesterol, overweight, or obesity. Making healthier choices—like eating more fruits and vegetables, exercising regularly, quitting smoking, reducing salt, and avoiding too much alcohol—can lower the risk.

PREVENTING CARDIOVASCULAR EMERGENCIES

Cardiovascular emergencies, like heart attacks and strokes, often develop over time due to unhealthy lifestyle habits and certain medical conditions. Many of these can be prevented or reduced by making healthy choices.

1. Healthy Diet

- Eat more fruits, vegetables, whole grains, and lean proteins.
- Reduce salt, sugar, and saturated fat in your diet.
- Avoid processed and fast foods when possible.

2. Regular Physical Activity

- Aim for at least 150 minutes of moderate exercise per week (like brisk walking, cycling, or swimming).
- Physical activity keeps your heart strong, helps control weight, and lowers blood pressure.

3. Avoid Tobacco and Limit Alcohol

- Quit smoking or using any tobacco products. Smoking is a major cause of heart and blood vessel problems.
- Limit alcohol to moderate levels (for adults, up to 1 drink/day for women and 2 drinks/day for men).

4. Maintain Healthy Weight

- Being overweight increases the risk of heart disease, high blood pressure, and diabetes.
- A healthy weight can be maintained through a balanced diet and regular exercise.

5. Manage Medical Conditions

- Keep blood pressure, cholesterol, and blood sugar under control.
- Follow your doctor's advice, take prescribed medications, and go for regular check-ups.

6. Reduce Stress

- Long-term stress can increase heart disease risk.
- Use relaxation techniques like deep breathing, meditation, yoga, or hobbies.
- Get adequate sleep and connect with family and friends for support.

7. Stay Informed and Act Early

- Learn the signs of heart attack and stroke.
- Seek medical help immediately if you notice chest pain, shortness of breath, or sudden weakness or numbness.

6.2 HEART-RELATED EMERGENCIES

Heart disease happens when arteries get narrowed or hardened by fat and cholesterol deposits. This reduces blood flow to the heart. If the heart doesn't get enough oxygen, it can cause:

- Angina – temporary chest pain
- Heart Attack – permanent damage to heart muscles

General First Aid for Cardiovascular Emergencies

1. Ensure the scene is safe. Wear gloves or other protective equipment if needed. Introduce yourself and get the person's consent to help.
2. Call 911 (EMS) immediately and ask someone to bring an AED if available.
3. Ask the person to stop any activity and rest.
4. Help them sit comfortably, usually semi-sitting on the floor.
5. Loosen tight clothing around the neck, chest, and waist.
6. Reassure the person to reduce anxiety, as fear can make the heart work harder.
7. Stay with the person until EMS arrives, monitoring their condition and providing support.

ANGINA

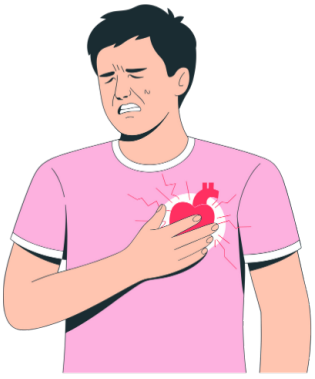
Angina is chest pain or discomfort that happens when the heart does not get enough oxygen. It often feels like pressure, squeezing, or heaviness in the chest. The discomfort can also appear in the shoulders, arms, neck, jaw, or back. Angina usually happens during physical activity, stress, heavy work, or after a large meal. The pain often goes away when the person rests or takes their prescribed medication. Angina is not a disease on its own—it is a warning sign of an underlying heart problem, usually caused by narrowed or blocked heart arteries.

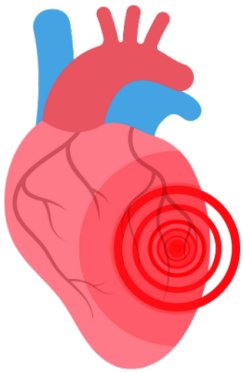
First Aid for Angina

1. Follow general first aid for cardiovascular emergencies (ensure safety, call EMS if needed, help the person sit comfortably, loosen tight clothing, reassure them).
2. Medication:
   i Doctors often prescribe nitroglycerin for angina.
   ii It can come as a tablet or spray, which is placed under the tongue.
   iii Assist the person take their medication if available.
3. Monitor:
   i Wait about 4 minutes after taking nitroglycerin.
   ii If pain continues or gets worse, call EMS 911 immediately.
   iii If EMS arrival is delayed, nitroglycerin may be repeated every 5–10 minutes, up to 3 doses.
4. If the person becomes unconscious and stops breathing, start CPR until help arrives.

Precautions

- Ask if the person has recently taken erectile dysfunction medication like Viagra (within 24 hours) or Cialis (within 48 hours).
  - If yes, do not give nitroglycerin, as it can dangerously lower blood pressure.
- If you suspect a heart attack, call EMS 911 immediately. It is always safer to have medical help on time than risk a serious outcome.





HEART ATTACK

A heart attack happens when blood flow to a part of the heart is blocked or reduced, causing the heart cells in that area to die because they do not get enough oxygen. The most common cause of a heart attack is a blood clot. Blood clots often form in arteries that are narrowed by fat and cholesterol deposits. Quick medical treatment can save lives, so call 911 immediately if you suspect a heart attack.

Important: *Anyone with chest pain should be suspected of having a heart attack.*

Types of Heart Attack

1. Heart Attack Without Chest Pain (Silent Heart Attack):

About 25% of heart attacks do not cause chest pain. More common in women, diabetics, and older people. Symptoms may include:

- Feeling very tired
- Trouble breathing
- Fainting

2. Heart Attack With Chest Pain:

About 75% of heart attacks cause chest pain, usually in the center of the chest. The pain may spread to the neck, jaw, left shoulder, or left arm. Pain intensity can vary: some feel mild discomfort, others severe crushing pain. Other common symptoms include:

- Shortness of breath or faster breathing
- Cool, sweaty skin
- Bluish, pale, or gray lips, fingers, or skin
- Nausea
- Anxiety or fear

Note: *If the heart attack affects the part of the heart that controls its rhythm, the heart may stop beating normally, which is called cardiac arrest. In this case, CPR is needed immediately.*

FIRST AID FOR HEART ATTACK

1. Recognize the Signs
   - i Chest pain or pressure (may spread to neck, jaw, shoulder, or arm)
   - ii Shortness of breath
   - iii Sweaty, cool, or pale skin
   - iv Nausea or vomiting
   - v Feeling anxious, weak, or faint
   - vi Note: Some heart attacks may not have chest pain, especially in women, older adults, and diabetics.
2. Keep the Person Safe and Comfortable
   - i Sit them down or help them lie semi-sitting
   - ii Loosen tight clothes around neck, chest, and waist
   - iii Reassure them, stay calm
   - iv Avoid physical activity
3. Call for Help
   - i Dial 911 immediately
   - ii Ask someone to bring an AED if available
4. Assist with Medication (If Safe)
   - i Prescribed medicine: Help them take it
   - ii No prescription: Ask about allergies to aspirin
   - iii If safe, give 160–325 mg aspirin to chew
   - iv Do not use Tylenol, Advil, or other painkillers instead
5. Monitor and Support
   - i Stay with them until EMS arrives
   - ii Watch breathing and responsiveness
6. If They Become Unconscious
   - i Check breathing
   - ii If not breathing, start CPR (30 chest compressions, 2 rescue breaths)
   - iii Use an AED if available

Important Precautions

- Do not repeat aspirin without medical advice
- Never ignore chest pain – it could be a heart attack
- Stay calm – your reassurance helps the patient
- Why aspirin: During a heart attack, aspirin slows blood clotting, reduces clot size, and makes blood thinner. Other painkillers like Tylenol or Advil do not do this.
- Do not repeat aspirin doses without medical advice.

ARTERIOSCLEROSIS

Arteriosclerosis is the thickening and stiffening of the walls of the arteries, which reduces blood flow to organs and tissues. It is often referred to as the "hardening of the arteries".

Causes

Several factors contribute to arteriosclerosis, including:

- Aging
- High blood pressure (hypertension)
- High cholesterol or fatty deposits (plaque)
- Smoking
- Diabetes

Signs and Symptoms

Arteriosclerosis develops gradually and may not show early symptoms. When they appear, they can include:

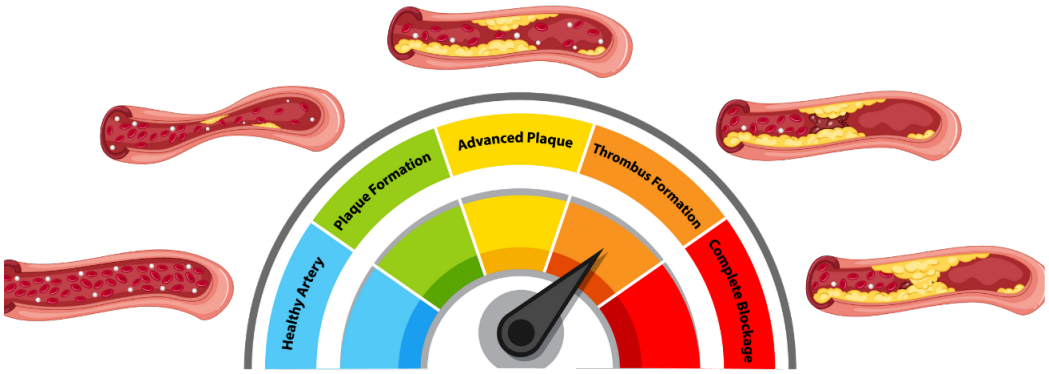
- Chest pain (angina)
- Shortness of breath
- Fatigue or weakness
- Numbness or coldness in the limbs
- Poor circulation

First Aid Awareness

Although arteriosclerosis is managed medically, first aiders should be aware of the following:

1. Recognize warning signs of complications, such as heart attack or stroke.
2. Call emergency services immediately if there is sudden chest pain, weakness, or speech difficulties.
3. Encourage healthy lifestyle habits, including exercise, balanced diet, and avoiding smoking.
4. Monitor for poor circulation or fainting and respond accordingly.

Key Point: *Early recognition of symptoms and prompt medical attention can prevent serious complications and save lives.*



Stages of Arteriosclerosis

6.3 BRAIN-RELATED EMERGENCIES

The nervous system is the body's control and communication network. It is responsible for sending, receiving, and processing information to keep the body functioning safely and effectively. The nervous system has two main parts: the central nervous system (CNS), which includes the brain and spinal cord, and the peripheral nervous system (PNS), which includes the nerves that connect the CNS to the rest of the body.

The PNS includes sensory nerves that carry information from the body to the brain and motor nerves that carry instructions from the brain to the muscles. Part of the nervous system, called the autonomic nervous system, controls automatic functions such as heart rate, blood pressure, breathing, and digestion—functions that are especially important during medical emergencies.

Together, the nervous system controls voluntary actions like walking and speaking, as well as involuntary actions such as breathing and heartbeat. It also detects changes in the body and environment and triggers appropriate responses to protect life and maintain balance.

A brain emergency occurs when normal blood flow to the brain is disrupted. Common examples include stroke and Transient Ischemic Attack (TIA), which require rapid recognition and immediate medical attention.

STROKE

A stroke occurs when brain cells die because they do not get enough oxygen. It is the third most common cause of death in North America. While strokes are more common in people over 50, anyone can have a stroke.**Signs and Symptoms of a Stroke**

A stroke can happen suddenly. Look for one or more of these signs:

- Severe sudden headache
- Sudden trouble seeing in one or both eyes
- Loss of balance or trouble walking
- Loss of bladder or bowel control
- Trouble speaking or understanding language
- Weakness, especially on one side of the body
- Unresponsiveness or temporary loss of consciousness

FAST – Quick Way to Spot a Stroke

Use the FAST test to check for stroke:

- F – Face: Ask the person to smile. Does one side drop?
- A – Arms: Ask them to raise both arms. Does one arm drift down or feel weak?
- S – Speech: Can they speak clearly? Do they have trouble speaking or understanding?
- T – Time: Call 911 immediately. The sooner treatment starts, the better the outcome.

First Aid for Stroke

1. Follow the general first aid steps for cardiovascular emergencies.
2. Call EMS 911 immediately – early treatment can save brain cells.
3. Help the patient sit in a comfortable position, usually semi-sitting.
4. If the person prefers to lie down, place them in the recovery position on the affected side if they drool or have trouble swallowing.
5. Start CPR if they become unconscious and stop breathing before EMS arrives.
6. Note the exact time symptoms started – this is critical for EMS because some stroke treatments must be given quickly.

Key Points

- A stroke can cause permanent brain damage, but quick action can save lives.
- Always call EMS immediately if you suspect a stroke.
- Use FAST to check for stroke signs.

WHAT IS A TRANSIENT ISCHEMIC ATTACK (TIA)?

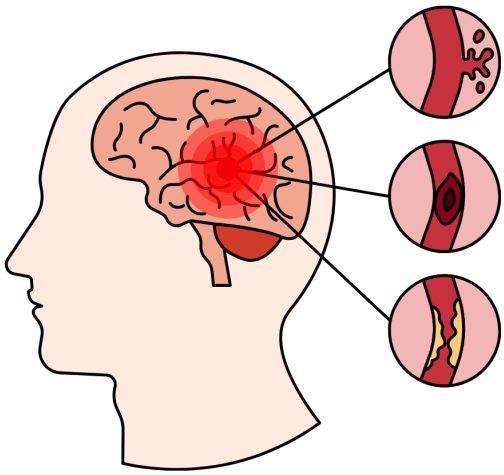
TIAs are caused when blood flow to the brain is partially blocked or only blocked for a short time. TIAs are also called "mini-strokes." Brain cells are injured but do not die, so there is no permanent brain damage. TIAs usually last a few minutes, and most symptoms disappear within an hour, though rarely they can last up to 24 hours.

First Aid for TIA

1. TIA looks like a stroke, and a first aider cannot tell them apart. Treat it the same as a stroke.
2. Call EMS 911 immediately, even if the symptoms go away completely.
3. A person who has had a TIA is at very high risk for a stroke – TIAs are warning signs.

Key Points

- TIAs are warning signs – they may lead to a full stroke if not treated.
- Always call EMS 911 immediately, even if symptoms disappear.
- Use FAST to quickly check for stroke or TIA signs.



Chapter 7: Head, Neck, Spinal & Muskuloskeletal Injuries

LEARNING OBJECTIVES

1. Identify the causes, signs, and symptoms of musculoskeletal, head, neck, and spinal injuries, including concussions and traumatic brain injuries.
2. Provide appropriate first aid care, including the RICE method for minor injuries, safe use of splints and slings, and stabilization of head, neck, and spine.
3. Recognize high-risk head, neck, and spinal injuries, monitor airway, breathing, and circulation (ABCs), avoid unnecessary movement, and call EMS/911 when needed.
4. Safely immobilize, roll, lift, and transport injured persons using proper techniques, teamwork, and spinal protection while providing reassurance and continuous monitoring.

Case Scenario: *You see your friend trip on the stairs and land on their outstretched arm. Their wrists look bent unnaturally, they are in severe pain, and there is some swelling. What would you do to provide first aid for your friend's injury?*

The musculoskeletal system gives the body structure, support, and movement. It also protects organs and helps the body perform daily activities.

Major Structures

- Bones – Provide support and shape, protect organs, and store minerals
- Muscles – Allow movement by contracting and relaxing
- Joints – Connect bones and allow flexible movement
- Ligaments – Strong bands that connect bones to bones and stabilize joints
- Tendons – Connect muscles to bones to transmit force and create movement

Functions

- Support – Gives the body shape and holds it upright
- Movement – Works with muscles and joints to move the body
- Protection – Shields vital organs like the brain, heart, and lungs
- Blood Production – Some bones make red and white blood cells
- Storage – Bones store minerals such as calcium and phosphorus

Understanding the musculoskeletal system helps first aiders identify injuries like fractures, sprains, and strains and provide safe care without causing further harm.

7.1 HEAD AND NECK INJURIES

The brain controls all body functions, and the skull protects it. The spinal cord connects the brain to the rest of the body, sending and receiving messages. Because the skull is rigid, swelling or bleeding inside can be life-threatening. Head injuries are common causes of disability and death.

TYPES OF HEAD INJURY:

1. Open head injury: Skull is fractured, brain tissue may be exposed.
2. Closed head injury: Skull is fractured or bruised, but brain is not exposed.

Parts of the Head That Can Be Injured:

- Scalp (skin covering the skull)
- Skull (bones protecting the brain)
- Brain

Causes of Head Injury

- Motor vehicle accidents (cars, motorcycles, pedestrian accidents)
- Violence or fights
- Sports injuries, Falls
- Child abuse
- Accidents at home, work, or outdoors

INJURIES TO THE SCALP

The scalp has many blood vessels, so even minor cuts can bleed heavily.

First Aid:

1. Follow general first aid rules and call EMS 911. Ask someone to bring an AED.
2. Do not press directly on a soft area or suspected fracture; apply pressure only around the wound edges.
3. If there is a dip, soft spot, bone pieces, or uncertainty about the injury, call EMS immediately.
4. If there is an impaled object, do not remove it. Stabilize it with a bulky dressing.

INJURIES TO THE SKULL

A hard blow can fracture the skull. Skull fractures may also involve the face or jaw.

Signs and Symptoms:

- Sudden, severe headache
- Seizures
- Nausea or repeated vomiting
- Weakness in limbs
- Altered consciousness

First Aid:

1. Cover open skull wounds with sterile dressing to prevent infection.
2. Stabilize the head and neck carefully.
3. Call EMS 911 immediately.

INJURIES TO THE BRAIN

Brain injuries can be:

1. Compression: Life-threatening pressure on the brain from swelling or bleeding Signs are Headache, vomiting, drowsiness, dizziness, confusion, progressive loss of consciousness.
2. Concussion: Brain function is temporarily altered due to a blow. Signs are Headache, ringing in ears, blurry vision, nausea, vomiting, fatigue, confusion, drowsiness.

Children may also show:

- Restlessness or irritability
- Excessive crying
- Loss of balance
- Lack of interest in favorite toys
- Changes in eating or sleeping patterns
- Vomiting or seizures

TRAUMATIC BRAIN INJURY (TBI) AND CONCUSSION

Definition:

TBI occurs when a blow, bump, or jolt to the head damages the brain. A concussion is a mild form of TBI, usually temporary, affecting brain function.

Causes:

- Falls or accidents
- Vehicle collisions
- Sports injuries
- Assaults or blows to the head

Signs and Symptoms:

Mild (Concussion):

- Headache or pressure in the head
- Dizziness, nausea, or vomiting
- Confusion or memory problems
- Sensitivity to light or noise
- Fatigue or drowsiness

Moderate to Severe TBI:

- Loss of consciousness
- Repeated vomiting
- Severe headache
- Slurred speech or confusion
- Weakness or numbness in limbs
- Seizures

Management / First Aid:

1. Ensure scene safety and call emergency services for moderate/severe injuries.
2. Monitor airway, breathing, and circulation (ABCs).
3. Keep the person still and calm, avoid moving the head or neck if spinal injury is suspected.
4. Monitor for changes in consciousness, breathing, or neurological signs.
5. Do not give food or drink if the person is drowsy, vomiting, or has a decreased level of consciousness.
6. For mild concussions: rest, avoid strenuous activity, and seek medical assessment.

Key Point: *All head injuries should be taken seriously, as symptoms may worsen over time. Early recognition and proper care can prevent complications.*

When to Call EMS 911

Call EMS 911 if any of the following occur after a head or neck injury:

- Unconsciousness or altered responsiveness
- Drowsiness or confusion
- Heavy bleeding
- Blood or yellowish fluid from nose or ears
- Severe pain or pressure in head, neck, or back
- Depressions or unusual shape in head or neck
- Seizures
- Breathing or vision problems
- Vomiting
- Unequal pupils
- Weakness, tingling, or loss of movement in any body part
- Any doubt about the person's condition

FIRST AID FOR NECK TRAUMA

Neck trauma is a serious injury that can affect the spinal cord, airway, and breathing. Any injury to the head or neck must be treated as a possible spinal injury until proven otherwise. Improper movement can cause permanent damage or death, so first aid care must focus on protecting the spine while keeping the airway open.

Recognizing Neck Trauma

Suspect neck trauma if the person:

- Was involved in a fall, collision, or blow to the head or neck
- Complains of neck pain, stiffness, or tingling
- Cannot move their head or neck
- Has difficulty breathing or speaking
- Is unconscious after trauma

General First Aid for Neck Trauma

1. Call EMS/911 immediately.
2. Do not move the person's head or neck unless absolutely necessary.
3. Manually stabilize the head and neck in the position found by placing your hands on both sides of the head.
4. Tell the person to stay still and reassure them.
5. Keep the person warm and calm while monitoring their condition.

AIRWAY MANAGEMENT WITH A SUSPECTED NECK INJURY

A neck injury can cause airway obstruction due to swelling, bleeding, muscle damage, or loss of muscle control. Maintaining the airway is critical, but it must be done without moving the neck.

Opening the Airway Safely

- Do NOT use the head-tilt/chin-lift method.
- Use the jaw-thrust maneuver:
    - Place your fingers behind the angles of the lower jaw.
    - Gently lift the jaw forward without tilting the head.
- This method helps open the airway while keeping the neck aligned.

Checking the Airway

Look for signs of obstruction such as:

- Gurgling sounds
- Labored or noisy breathing
- Inability to speak or cough
- Remove only visible obstructions from the mouth if easily reachable.

Do NOT perform blind finger sweeps, as this can push objects deeper or cause injury.

If the Person Is Breathing

1. Continue manual stabilization of the head and neck.
2. Monitor airway, breathing, and circulation (ABCs).
3. Watch for worsening breathing, swelling, or signs of shock.
4. Do not give food or drink.

If the Person Is Not Breathing

1. Call EMS/911 if not already done.
2. Begin CPR immediately.
3. Use the jaw-thrust maneuver for rescue breaths.
4. Continue CPR until help arrives or the person shows signs of life.

Important Safety Note: Always assume a spinal injury when managing neck trauma

7.2 SPINAL INJURIES

The spinal cord is a bundle of nerves that runs from the brain down the back, protected by the spine (a column of bones). It controls all messages between the brain and the body. Spinal injuries are very serious because they can damage these nerves, sometimes permanently.

INDICATIONS FOR SPINAL PRECAUTIONS

Spinal precautions are needed when there is risk of injury to the spinal column. You should assume a spinal injury in situations such as:

- Falls from a height or significant force
- Vehicle collisions or crush injuries
- Blunt trauma to the head, neck, or back
- Diving or swimming accidents
- Sports injuries involving sudden impact
- Any accident with loss of consciousness or confusion

Always take spinal precautions if you suspect a spinal injury, even if no obvious signs are present.

SIGNS AND SYMPTOMS

Look for these warning signs for Spinal Column Injuries:

Physical signs:

- Severe pain in the neck, back, or head
- Deformity or abnormal posture of the spine
- Bruising or swelling along the spine
- Tingling, numbness, or loss of sensation in limbs

Neurological signs:

- Weakness or paralysis in arms or legs
- Loss of bladder or bowel control
- Difficulty moving or coordinating movements

Other signs:

- Shock symptoms: pale, clammy skin, rapid pulse
- Confusion or loss of consciousness

FIRST AID FOR SPINAL INJURIES

Step 1: Follow general first aid rules. Call EMS 911 immediately. Ask someone to bring an AED if available.

Step 2: If there is life-threatening bleeding, stop it—but do not move the person's head or neck while doing so.

Step 3: If the person is conscious:

- Ask them to stay as still as possible.
- If they cannot keep still, ask a bystander to hold the head and neck steady.

Step 4: Continuously:

- Check ABCs (Airway, Breathing, Circulation)
- Reassure the person
- Provide care until EMS arrives

Important Rule – Life Over Limb:

Saving the person's life is more important than preventing paralysis. For example, if someone with a spinal injury is not breathing, you must open the airway and start CPR immediately, even if it risks moving the spine.

APPROACH, ASSESS, AND PROVIDE MANAGEMENT

When approaching and managing with suspected spinal injury:

A. Approach safely:

- Ensure the scene is safe for you and the person
- Speak calmly to the person to reduce anxiety
- Avoid sudden movements or twisting the person's body

B. Assess:

- Check level of consciousness, airway, breathing, and circulation (ABCs)
- Look for signs of spinal injury (see above)
- Ask the worker about pain or numbness if conscious

C. Provide management:

- Immobilize the spine: Keep the head, neck, and back aligned. Use a cervical collar or support if available
- Do not move the person unnecessarily
- Control bleeding and manage shock without twisting the spine
- Monitor vital signs continuously
- Call emergency services immediately
- Reassure the person and explain everything you are doing

Proper spinal management can prevent further injury, including paralysis.

MANAGEMENT OF A SUSPECTED SPINAL COLUMN FRACTURE

Rolling a Person With Head, Neck, or Spinal Injury

Sometimes you may need to roll a person to give CPR or check the airway, even if you suspect a spinal injury.

Scenario: *You find a colleague lying face down, unconscious, and not breathing. You suspect head or spinal injury.*

Step-by-Step Procedure (Requires 2–3 First Aiders):

1. First First Aider (Head Support):
   - i Kneel at the person's head.
   - ii Place the right hand on the right side and left hand on the left side of the head.
   - iii Keep the head completely stable.
2. Second First Aider (Torso Support):
   - i Extend the person's near arm over their head.
   - ii Hold the person's clothes at shoulders and waist firmly to stabilize the torso.
3. Third First Aider (Leg Support, if available):
   - i Place hands under the person's legs to support them.
4. Rolling as One Unit:
   - i The first aider leads the move.
   - ii On the command "1, 2, 3", all first aiders roll the person together as one unit toward the second first aider.
   - iii This ensures the head, neck, and spine stay aligned during the move.

Tip: *Always move the person as one straight unit. Never twist or bend the spine.*

7.3 LIFTING AND MOVING THE ILL OR INJURED PERSON

When someone is ill or injured, your first goal is to keep them safe and provide first aid at the location they are in. In most situations, you should not move them, because moving a person incorrectly can make their injuries worse. Only trained Emergency Medical Services (EMS) personnel, such as paramedics, should move the injured whenever possible.

CRITERIA FOR TRANSPORTATION/WHEN TO MOVE SOMEONE?

You should never move an ill or injured person unless absolutely necessary. Life-threatening reasons for moving include:

- Immediate danger at the scene – e.g., fire, collapsing building, flood.
- Inability to provide first aid at that location – e.g., risk of hypothermia in a cold environment.
- Evacuation from a hazardous environment – e.g., smoke-filled area.

If moving is necessary:

- Move them to the nearest safe place.
- If conscious, explain clearly:
    - Why moving is necessary
    - How you will help them move safely

Other considerations:

- Severity of injury or illness
- Ability to move safely (avoid worsening injuries)
- Available resources (stretcher, wheelchair, vehicle)
- Worker's condition (consciousness, breathing, bleeding)
- Access to help (professional medical support nearby)

Note: Never move someone unnecessarily—stabilize first whenever possible.

CARE DURING TRANSPORTATION

While moving the worker:

1. Maintain body alignment – Keep head, neck, and spine stable if spinal injury is suspected.
2. Monitor vital signs – Check breathing, pulse, and consciousness.
3. Control bleeding and manage shock – Apply pressure and keep warm.
4. Provide reassurance – Speak calmly and explain each step.
5. Avoid rough movements – Move slowly and steadily.
6. Use proper lifting techniques – Bend your knees, not your back.
7. Stay alert for changes – Stop if condition worsens and call for help.

Key Point: *Safe, careful transportation can save lives and prevent complications, but should never replace professional medical care.*

Be aware of spinal injuries

Many accidents, such as road traffic collisions or falls, may cause spinal injuries. This is very serious because any movement of a fractured or unstable spine can cause permanent paralysis. Unconscious accident victims should always be treated as if they have a spinal or head injury until proven otherwise. Paramedics have specialized equipment, like neck collars, to protect the spine. As a first aider, you usually do not have this equipment, so extreme caution is necessary.

Remember: *Respect the spine and avoid bending or twisting the head, neck, or back while moving anyone.*

TECHNIQUES FOR MOVING AN INJURED OR UNCONSCIOUS PERSON

There are several ways to move someone safely. You should:

Follow local protocols or guidelines and take formal training before attempting any moving techniques.

Moving alone

- Dragging is easier than carrying if you are alone.
- Drag by the head if legs are injured.
- Drag by the feet if upper limbs are injured.
- Always support the head and neck while dragging someone.
- Use a blanket or sheet if possible to protect the spine and make dragging easier.

Moving conscious people

- Children or small adults can be carried like a backpack.
- Adults who can walk with help can be assisted using the two-handed seat method:
    - Each helper supports the back with one arm
    - Holds the other's wrists to form a "seat"
- Person with arm or leg injuries can be lifted using a blanket.

Precautions while moving anyone

- Move safely – don't rush, and always look for obstacles.
- Respect the spine – especially for unconscious people who cannot describe pain.
- Keep the body straight – avoid bending the head forward or backward.
- Use protective tools – blankets, sheets, or clothing can help secure the person.

7.4 COMMON MUSKULOSKELETAL INJURIES

TYPES OF INJURIES

1. Sprain: Stretching or tearing of ligaments. Common in ankles, knees, wrists, and fingers.
2. Strain: Stretching or tearing of muscles or tendons. Often occurs in the neck, back, thighs, or lower leg muscles.
3. Dislocation: Bones move out of their normal position, usually from a strong force. Common in shoulders and fingers.
4. Fracture: Complete break or cracks in a bone.
   - i Open fracture: Skin is broken; bone may protrude.
   - ii Closed fracture: Skin intact, soft tissue may be damaged underneath.
   - iii Greenstick fracture: Incomplete fracture common in children.
   - iv Comminuted fracture: Bone breaks into several pieces.
   - v Hairline fracture: Small cracks in the bone.
   - vi Stress fracture: Caused by repetitive activity, common in athletes.
   - vii Avulsion injury: Muscle or tendon pulls a piece of bone.

Causes of Injuries

- Direct blows
- Falls or accidents
- Dislocations from force
- Overuse
- Poor posture

Signs and Symptoms

- Pain, swelling, bruising, deformity
- Muscle cramps or twitches
- Burning sensation in muscles
- Pain worsens with movement
- Skin discoloration
- Loss of movement or function in the limb

WHEN TO CALL EMS 911

Call EMS if the person is unconscious, has life-threatening bleeding, trouble breathing, head/neck/spine injury, severe swelling or discoloration, inability to move the injured part, pale/blue/cold skin below the injury, or bone protrudes through the skin.

FIRST AID FOR CLOSED AND OPEN FRACTURES

Closed Fracture

A closed fracture is when a bone is broken but the skin has not been opened.

First Aid Steps:

1. Keep the injured person still and encourage them not to move the affected limb.
2. Support the injury using soft padding, a sling, or any material that prevents movement.
3. Use a cold pack wrapped in a cloth to help reduce swelling and pain.
4. Never try to straighten the limb or force the bone back into position.
5. Check circulation below the injury: look for warmth, color, and normal movement or feeling.
6. Call for medical help if the limb looks deformed, very painful, or cannot be used.
7. Watch for signs of shock, especially with major injuries.

Open Fracture

An open fracture is when a broken bone breaks through the skin or the wound reaches the bone.

First Aid Steps:

1. Call emergency services right away — this type of injury is serious and needs urgent care.
2. Do not push the bone back inside and do not straighten the limb.
3. Control bleeding carefully, applying pressure around the wound, not directly on exposed bone.
4. Cover the wound with a clean or sterile dressing to protect it from infection.
5. Support the injured area with padding or gentle splinting, avoiding unnecessary movement.
6. Avoid heavy pressure on the injured area; focus on keeping it clean and still.
7. Monitor the person for changes in breathing, responsiveness, or signs of shock.
8. Keep them calm, warm, and still until help arrives.

7.5 SPRAIN VS STRAIN

SPRAIN

Definition: Stretching or tearing of ligaments (the tissue connecting bones in a joint).

Cause: Twisting, falling, or overstretching a joint.

Common Sites: Ankle, wrist, knee, fingers.

Symptoms:

- Pain around the joint
- Swelling
- Bruising
- Difficulty moving the joint

STRAIN

Definition: Injury to a muscle or tendon (the tissue that connects muscles to bones).

Cause: Overstretching, overuse, or tearing of a muscle.

Common Sites: Back, neck, hamstring, calves.

Symptoms:

- Muscle pain or soreness
- Swelling or inflammation
- Muscle weakness
- Muscle spasms or cramping

7.6 GENERAL FIRST AID FOR MUSCULOSKELETAL INJURY

If the person is conscious

- Monitor breathing, pulse, and shock.
- Decide whether to call EMS.
- Treat injuries using the RICE method.

RICE METHOD

The RICE method is a widely used approach to provide first aid for minor to moderate injuries involving muscles, bones, or joints. It helps reduce pain, limit swelling, and support healing. RICE stands for Rest, Immobilization, Cold, and Elevation.

1. **Resting** the injured area is essential to allow the body to start the healing process. Movement increases blood flow, which can worsen swelling and cause more pain. The person should stop any activity that may aggravate the injury. Encourage them to stay still and avoid putting weight or stress on the affected limb. Rest is especially important in the first 24–48 hours after injury.
2. **Immobilizing** the injured part prevents further damage and reduces pain. Use a splint, cravat, or any safe support to keep the joint or bone in the position you found it. Avoid trying to straighten broken or dislocated bones, as this may cause severe injury or bleeding. Always check the circulation (warmth, color, and sensation) of fingers or toes before and after applying a splint to ensure blood flow is not restricted. If unsure how to immobilize the injury, keep the person still and wait for medical help.
3. **Cold therapy** reduces swelling, inflammation, and pain. Apply an ice pack or cold compress to the injured area for about 20 minutes every hour during the first 48 hours after injury. Always place a towel or cloth between the ice and the skin to prevent frostbite or skin irritation. After swelling has gone down, typically 48–72 hours later, a warm compress or gentle heat can be used to relax muscles and improve blood flow.
4. **Elevating** the injured limb above the level of the heart helps fluid drain away from the area, minimizing swelling. For example, if the arm is injured, support it on a pillow above chest level. Avoid elevating the limb if it causes additional pain or discomfort. The combination of rest, immobilization, cold, and elevation works together to control swelling, reduce pain, and support faster recovery.

If the person is unconscious

- Follow ABCs (Airway, Breathing, Circulation).
- Provide CPR if not breathing.
- Stop life-threatening bleeding with direct pressure or tourniquet.
- Do not apply a splint; wait for EMS.

Key Points to Remember

- Always monitor the injured person for signs of severe injury, such as deformity, numbness, or excessive bleeding, and call emergency services if necessary.
- The RICE method is most effective during the initial 48 hours following the injury.
- Regularly check the injured area for changes in color, temperature, or sensation.

7.7 SPLINTING

Definition: A support used to immobilize a bone or joint to prevent movement and reduce pain after injury. It protects injured bones, joints, or muscles while waiting for professional medical care. It is used for fractures, severe sprains, dislocations, or any injury where movement can make it worse.

TYPES OF SPLINTS:

1. Soft Splints: Made from soft materials like towels, pillows, folded blankets, or bandages.
2. Rigid Splints: Made from hard objects such as boards or rolled newspapers.
3. Anatomical Splints: Use another body part for support, e.g., injured leg with uninjured leg, finger to finger, or arm to chest.
4. Commercial Splints: Pre-made splints like the SAM splint, which can be molded to fit any body part.

QUALITIES OF A GOOD SPLINT:

- Light but strong enough for support.
- Long enough to cover the joint above and below the injury.
- Wide enough for the thickest part of the limb.
- Padded for comfort.

PRINCIPLES OF SPLINTING:

1. Only splint if trained. If EMS is on the way, keep the person still.
2. Do not straighten broken or dislocated bones. Keep joints above and below the injury stable.
3. Measure the splint against the uninjured side.
4. Cover wounds with sterile dressing before splinting.
5. Remove jewelry below the injury site.
6. Check circulation before and after applying the splint. Reassess every 10 minutes.
7. Pad the splint to prevent pressure. Do not give food or drink until medical help is reached.

7.8 SLINGS

Slings support an injured arm or wrist using a triangular bandage.

TYPES OF SLINGS:

1. Regular Sling: Holds the arm horizontally across the abdomen.
2. Tube Sling: Holds the arm slightly vertically against the chest.

REGULAR SLING STEPS:

1. Check circulation of the injured arm.
2. Support the arm across the body.
3. Slide a triangular bandage between the arm and body.
4. Apex points toward the elbow; base runs over the shoulder.
5. Loop the bottom point behind the neck and tie on the uninjured side.
6. Arrange the arm so the elbow is slightly bent and the forearm slightly elevated.
7. Secure the elbow with the apex twisted or pinned.
8. Wrap a second broad bandage around the arm and body and tie snugly.
9. Recheck circulation. Loosen if too tight; call EMS if circulation does not improve.

TUBE SLING STEPS:

1. Check circulation by comparing the injured hand with the uninjured one. Ask about numbness or tingling.
2. Place the forearm across the chest, supported by the opposite hand.
3. Place the triangular bandage over the forearm and hand, apex extending past the elbow.
4. Tuck the bandage under the arm and twist near the elbow to secure.
5. Bring the twisted end to meet the other end near the uninjured shoulder.
6. Wrap a second broad bandage around the arm and body; tie snugly.
7. Pad between the arm and body for comfort.
8. Recheck circulation every 10 minutes. Loosen if circulation is restricted, and call EMS if necessary.

FAQs

1. **Can you move someone with a broken leg?** Only if necessary for safety; immobilize before moving.
2. **How long should ice be applied?** 20 minutes every hour for the first 48 hours.
3. **When can heat therapy be used?** After 48–72 hours to relax muscles and promote blood flow.
4. **How to know if EMS is needed?** Severe pain, inability to move, pale or cold limb, unconsciousness, or bone protruding.

7.9 DISLOCATION

A dislocation happens when the bones forming a joint are pushed out of their normal position. This can cause severe pain and make it hard or impossible to move the joint. Dislocations are most common in the shoulders, fingers, elbows, knees, and hips.

Causes:

- Falling or tripping
- Sports-related collisions or accidents
- Sudden twisting or heavy impact on a joint

Signs and Symptoms:

- The joint looks misshapen or out of place
- Intense pain at the joint
- Swelling or bruising
- Limited or no movement in the joint
- Tingling, numbness, or coldness in fingers or toes

FIRST AID FOR DISLOCATION:

1. Call emergency services immediately if the injury is serious, or if multiple injuries are present.
2. Keep the joint in the position it was found; do not try to push it back in place.
3. Stabilize the joint using a soft splint or sling to prevent movement.
4. Apply a cold pack wrapped in cloth to reduce swelling and discomfort.
5. Check circulation in the fingers or toes of the injured limb.
6. Monitor for signs of shock, like pale skin, rapid pulse, or faintness, and keep the person calm.
7. Do not give food or drink in case medical treatment or surgery is needed.

Precautions:

- Avoid pressing on the injured joint.
- Remove rings, bracelets, or tight clothing near the injury to prevent restriction during swelling.
- Always wait for professional medical help before attempting to move or reposition the joint.

7.10 WOUND CARE

A wound occurs when there is damage or a break in the body's soft tissues such as the skin, muscles, blood vessels, bones, or internal organs. Wounds can result from accidents, falls, sharp objects, or forceful impacts. They are generally categorized as open wounds or closed wounds, depending on whether the skin surface has been broken. When someone gets a wound, it's important to control bleeding, protect the wound from germs, and support healing. To do this, first aid uses dressings, bandages, and slings.

DRESSINGS

A dressing is a clean covering placed directly on a wound. It helps, Stop bleeding, Protect the wound from dirt and germ and absorb blood or other fluids

Types of Dressings:

1. Adhesive Dressings:
   i Small, sticky, sterile pads (like "band-aids").
   ii Used for minor cuts and scratches with little or no bleeding.
   iii Come in different sizes for fingers, hands, or arms.
2. Gauze Dressings:
   i Made from 100% cotton.
   ii Absorb blood and fluid from wounds.
   iii Can be gauze pads or gauze sponges.
   iv Useful for larger wounds or deeper cuts.
3. Improvised Dressings:
   i Any clean cloth can be used if you don't have a proper dressing.
   ii Examples: clean towel, bed sheet, or cotton cloth.

Good Dressings Should Be:

- Clean or sterile
- Large enough to cover the wound completely
- Absorbent to keep the wound dry
- Non-stick so it doesn't tear the skin when removed
- Safe (non-toxic and allergy-free)

BANDAGES

A bandage is used to hold a dressing in place, support a limb or joint and protect an injured area from movement

Common Bandages:

1. Roller Bandage:
    - Long rolls of cotton that can be cut to size.
    - Used to secure a dressing on a wound.
2. Triangular Bandage:
    - A triangle-shaped piece of cloth.
    - Can be used as an arm sling, to support a bone or joint, or as a pad to control bleeding.
    - Can be folded into different sizes:
        - Full triangular bandage: For large wounds or as an arm sling
        - Half or quarter fold: To hold dressing and apply gentle pressure
        - Narrow fold: For small areas or as a makeshift tourniquet

CHECKING CIRCULATION BELOW THE INJURY

Checking circulation before and after applying a bandage or splint is crucial. Swelling or tight bandaging can restrict blood flow and cause tissue damage.

Signs of Impaired Circulation

1. Skin Color: Pale or bluish compared to the uninjured side.
2. Skin Temperature: Feels cooler than the uninjured area.
3. Nail Bed Test:
    - i For arm injuries, press the fingernail bed; for leg injuries, press the toenail bed.
    - ii The nail turns white under pressure.
    - iii On release, it should return to normal color within 3 seconds.
    - iv A delay beyond 3 seconds indicates poor circulation.

Symptom Check:

Ask if the person feels numbness, tingling, tightness, or coldness in the area below the injury.

Improving Circulation

1. Loosen the bandage if it feels too tight.
2. If circulation does not improve, call 911 immediately.
3. If help is delayed, gently move or reposition the limb to relieve pressure on blood vessels.

INFECTION

A wound can get infected if germs (bacteria or viruses) enter the body. Infection can be local (only at the wound) or spread throughout the body.

Signs of Infection:

- Redness around the wound or red streaks moving away
- Pain or tenderness
- Swelling
- Pus (yellow/green fluid)
- Warmth in the area or fever

First Aid to Prevent Infection:

1. Wash hands before and after giving first aid.
2. Wear gloves if you come in contact with blood or body fluids.
3. Apply antibiotic ointment if the person is not allergic.
4. Advise the person to clean the wound and change the dressing if it gets dirty or wet.
5. Seek medical attention if infection signs appear.
6. Tetanus vaccination may be needed for deep or dirty wounds.

Key tips for safe wound care

- Keep all dressings and bandages clean and dry.
- Never touch the wound with dirty hands.
- Always reassure the injured person; stress and panic can make bleeding worse.
- Call EMS 911 for deep, heavily bleeding, or infected wounds.

TYPES OF WOUNDS

Open Wounds

These involve a visible break in the skin, which may cause external bleeding. Because the body's natural protective barrier is disrupted, open wounds are more prone to infection from bacteria or foreign materials.

Closed Wounds

In closed wounds, the skin remains unbroken, but internal tissues are injured. These can lead to internal bleeding, bruising, or swelling beneath the skin.

MAJOR CATEGORIES OF OPEN WOUNDS

1. Superficial Wounds

These are minor injuries that affect only the outermost skin layers. Examples include small cuts, abrasions, or scrapes, such as those from a kitchen knife or fingernail.

2. Deep Wounds

These injuries extend below the skin into the muscle or underlying tissue. They often occur due to accidents involving machinery, sharp tools, knives, or vehicle collisions. Deep wounds can cause heavy bleeding and require immediate medical attention.

3. Puncture Wounds

Puncture wounds are small openings in the skin made by a pointed object, such as a splinter, needle, or nail. Shallow punctures may affect only the skin, while deeper ones—such as knife or gunshot wounds—can damage internal organs or major blood vessels.

4. Amputations

An amputation occurs when a body part or limb is completely or partially detached from the body. This type of injury is a medical emergency and requires urgent professional care.

AMPUTATION

An amputation is the partial or complete separation of a body part from the rest of the body. It can result from machinery accidents, explosions, or sharp-force trauma. This type of injury is life-threatening and requires immediate emergency care.

1. Partial Amputation

In a partial amputation, the body part remains partially attached by tissue or skin.

First Aid Steps

1. Follow general first aid procedures.
2. Call 911 and ask for an AED.
3. Gently reposition partially connected amputation to its natural place without forcing movement.
4. Stop bleeding by applying direct pressure or using a tourniquet if required.
5. Treat the injury as an open wound—apply a sterile dressing and control bleeding until help arrives.

2. Complete Amputation

In a complete amputation, the body part is fully detached.

First Aid Steps

1. Follow general first aid rules.
2. Call 911 and request an AED.
3. Stop the bleeding:
   i Wash hands if possible.
   ii Have the person lie down, and if safe, elevate the injured limb slightly.
   iii If there is a risk of spinal, head, or leg injury, do not move the person.
   iv Apply steady direct pressure over the wound.
   v If blood soaks through, add more dressings—do not remove the first one.
   vi Use a tourniquet or pressure bandage if bleeding cannot be controlled.
4. Treat for shock:
   i Keep the person lying flat and raise the legs about 12 inches if safe.
   ii Cover with a blanket or coat to preserve warmth.
   iii Calm and reassure the person until EMS arrives.
5. Protect the wound:
   i Cover the injured area with a sterile dressing or clean cloth.
6. Care for the amputated part:
   i Rinse gently with clean water to remove dirt or debris.
   ii Place the part in a clean, waterproof plastic bag.
   iii Put that bag inside another bag or container filled with ice, but do not let the part touch the ice directly.
   iv Label the container with the person's name, date, and time of the injury and hand it to EMS personnel.
7. Continue to monitor ABCs, manage for shock, and provide reassurance until emergency services arrive.

Case Scenario: *You are on a weekend trip with friends at a cabin. While preparing food for a barbecue, your friend Maya accidentally slices her palm with a kitchen knife. The cut is deeper than a simple scratch and blood is dripping from her hand. She becomes light-headed and asks you to help because the first aid kit is in the car. It is a remote area, and EMS response may take longer than usual. What would you do?*

CLOSED WOUNDS AND INTERNAL BLEEDING (CONTUSIONS)

A closed wound occurs when tissues are injured without breaking the skin. Damage and bleeding happen internally, often from blunt force trauma, falls, or crush injuries. Internal bleeding can be life-threatening and is often not visible externally.

Types of Closed Wounds

1. Bruises (Contusions): Caused by small blood vessels breaking under the skin, leading to discoloration and tenderness. The area turns blue or purple and may be sore.
2. Hematomas: A localized collection of blood under the skin that may feel like a lump. It can vary in size and cause swelling and discoloration.
3. Crush Injuries: Caused by a heavy force or compression on the body. Although the person may seem fine initially, internal damage and bleeding can occur rapidly. Always suspect internal bleeding after severe trauma, especially falls or heavy impact injuries.

Signs and Symptoms of Internal Bleeding

- Pain and tenderness in the injured area.
- Swelling or firmness under the skin.
- Bruising that appears hours after injury.
- Signs of shock (pale skin, rapid pulse, weakness).
- Extreme thirst or restlessness.

First Aid for Closed Wounds and Internal Bleeding

1. Minor bruises usually heal without medical care.
2. Severe bruises, crush injuries, or suspected internal bleeding require immediate medical help—call 911 and request an AED.
3. Help the person rest in a comfortable position, preferably lying flat.
4. Monitor airway, breathing, and circulation (ABCs) continuously.
5. Watch for and treat signs of shock:
    i Cover the person with a blanket to maintain warmth.
    ii Reassure and keep them calm.
6. Apply a cold compress or ice pack to reduce pain and swelling.
    i Do not apply ice directly to the skin; wrap it in a cloth or towel.
    ii Apply for no more than 20 minutes, then remove for 30–40 minutes before reapplying.
7. Do not give food or drink to anyone with suspected internal bleeding.
    i If the person is very thirsty, moisten their lips with a damp cloth.

7.11 BURNS

Burns can happen when the skin or deeper tissues are damaged by heat, electricity, or chemicals. Understanding the type of burn helps determine the risks and the needed care.

- Heat or flames
- Electricity
- Chemicals
- Hot liquids or steam
- Sunlight or radiation
- Smoke or fume inhalation

Burns can range from mild to life-threatening, depending on how deep and large they are.

Estimating Burn Size – The Rule of Palm

The size of the burn can be estimated using the person's palm. The palm of the person's hand is equal to approximately one percent of the body's surface, regardless of the person's age

The palm = 1% of the total body area. Example: If the burn covers an area equal to three palms, it's about 3% of the body.

Types of Burns

Burns are injuries that occur when the skin or deeper tissues are damaged by heat, chemicals, electricity, radiation, or friction. Even though all burns cause harm to the skin, the source of the burn affects how serious the injury is and what kind of care is needed.

Understanding the different types of burns helps learners recognize dangers, respond safely, and know when emergency help is required. The main types include:

1. Thermal burns – caused by heat from fire, hot liquids, steam, or hot objects.
2. Electrical burns – caused by electric current passing through the body.
3. Chemical burns – caused by strong acids, alkalis, or other corrosive substances.
4. Radiation burns – caused by exposure to sources of radiation, such as the sun's ultraviolet (UV) rays, tanning beds, or medical radiation treatments.

Each burn type can range from mild to severe, depending on how deep the injury is and how much of the body is affected.

CLASSIFICATION OF BURNS

1. First-Degree Burn (Superficial)
   i Only the top layer of skin is affected.
   ii Red, painful, no blisters.
   iii Example: Mild sunburn.
2. Second-Degree Burn (Partial Thickness)
   i Deeper layer of skin is damaged.
   ii Painful, red, swollen, and blistered.
3. Third-Degree Burn (Full Thickness)
   i All skin layers and tissues below are damaged.
   ii Charred, white, or blackened skin.
   iii Little or no pain due to nerve damage.
   iv Call 911 immediately.

SIGNS AND SYMPTOMS OF BURNS

Burn injuries can affect the skin, deeper tissues, and even internal systems, depending on the severity. Common signs and symptoms include:

- Redness of the skin (erythema)
- Pain or tenderness at the burn site, Swelling around the area
- Blistering (small or large fluid-filled bubbles)
- Peeling or charred skin
- Dry, leathery, or white patches (seen in more severe burns)
- Visible soot or burn marks around the mouth or nose if caused by fire
- Difficulty breathing if the airway is affected
- Increased warmth over the injured area
- Altered sensation, such as numbness or loss of feeling in deeper burns
- Shock symptoms in severe cases (pale skin, rapid breathing, weakness)

CALL 911 IF:

- The burn is on the face, hands, feet, groin, buttocks, or major joints.
- The burn area is larger than 3 inches (8 cm) across.
- The person has trouble breathing or burns to the airway.
- The person is in severe pain or showing signs of shock (cold, pale, confused).
- The burn is caused by chemicals or electricity.
- You are unsure how serious the burn is — always be safe and call for help.

1. THERMAL BURNS (HEAT BURNS)

A burn caused by hot surfaces, flames, boiling water, or steam.

Prevention:

- Keep children away from stoves, ovens, candles, fireplaces, and hot liquids.
- Set water heaters to below 49°C (120°F) and always check the water before bathing children.
- Avoid leaving hot food or drinks near table edges. Use back burners on stoves and turn pot handles inward.

First Aid:

1. Move the person away from the heat source.
2. Cool the burn immediately with cold water for 10 minutes.
3. Remove rings, watches, or tight clothing near the burn.
4. Cover the burn with a dry, sterile dressing (do not use sticky gauze).
5. Partial-thickness burns (blisters or redness) should be checked by a doctor.
6. Full-thickness burns (charred or deep burns) require EMS 911. Keep monitoring breathing and consciousness until help arrives.

Precautions:

- Superficial burns may not need EMS unless there is severe pain, breathing problems, or unresponsiveness.
- Full-thickness burns always need EMS, no matter the size.

2. ELECTRICAL BURNS

Burns caused by electricity passing through the body (from wires, sockets, lightning, or electrical accidents).

Prevention:

- Never touch a person still in contact with electricity.
- Stay 6 meters (20 feet) away from sparking wires.
- Only move the person if they are in immediate danger.

First Aid:

1. Call 911 for high-voltage injuries or lightning strikes.
2. Turn off the electric source if safe.
3. Treat the person as if they have a head, neck, or spine injury.
4. Keep the person warm and calm.
5. Cover burns with sterile gauze or clean cloth (avoid blankets or towels).
6. All electrical injuries need a doctor, even if the burn looks minor.
7. Electrical burns can affect the heart; start CPR if the person is unconscious and not breathing.

3. CHEMICAL BURNS

Burns caused by strong chemicals, like acids, drain cleaners, paint thinner, or gasoline. Chemicals may be liquid or powder.

Prevention:

- Wear protective gloves and goggles when handling chemicals.
- Read and follow labels and safety instructions.

First Aid:

1. Call EMS 911 and wear protective equipment yourself.
2. If chemicals are swallowed, call the Poison Control Center immediately.
3. For skin contact: flush the area with cool running water for at least 15 minutes.
4. Remove any contaminated clothing.
5. Dry powders should be brushed off before rinsing, as water can make it worse.
6. For eye contact, flush immediately with large amounts of water.

4. RADIATION BURNS (SUNBURNS AND OTHER RADIATION)

Burns caused by sun, X-rays, or radiotherapy. The most common is sunburn.

First Aid:

1. Move the person out of the radiation or sun.
2. Look for heat exhaustion or heat stroke. Call EMS 911 if suspected.
3. Cool the burn with cold water.
4. Apply sunburn ointment after cooling.
5. Seek medical help if pain or blisters wors

Chapter 8: Occupational Health & Safety

LEARNING OBJECTIVES

1. Understand OHS basics, including workplace responsibilities, hazards, risks, and the role of AHJ regulations.
2. Identify common hazards, assess risks using simple tools, and apply effective control measures.
3. Perform the role of a workplace first aider: provide safe care within training, call EMS, monitor the casualty, and document accurately.
4. Follow OHS legislation principles such as duty of care, reporting, worker participation, and compliance.
5. Work within the first aid scope of practice and recognize when a situation requires medical help.
6. Assist safely with medication using the Five Rights and support only with prescribed emergency medications.
7. Use Safety Data Sheets, maintain first aid kits, and complete all post-incident duties including cleaning, restocking, reporting, and stress management.

WORKPLACE FIRST AID

Workplace First Aid is the immediate care provided to an employee, contractor, or visitor at a worksite who is injured or becomes ill. This care is given in accordance with workplace safety regulations until professional medical help arrives or the person can safely return to work.

Workplace first aid focuses on early intervention, reducing the severity of injuries or illness, and preventing conditions from getting worse while ensuring the safety of both the injured person and the first aider.

Authority Having Jurisdiction (AHJ) – First Aid Kits and Equipment in Ontario

In Ontario, the Authority Having Jurisdiction (AHJ) for workplace first aid kit requirements includes the Workplace Safety and Insurance Act (WSIA) and Regulation 1101 – First Aid Requirements.Regulation 1101 legally requires employers to provide appropriate first aid kits, equipment, and facilities based on the number of workers, workplace hazards, and work environment.

CSA Z1220 – Workplace First Aid Kits is the recognized standard used in Ontario to guide the contents, quantities, and classification of first aid kits (Basic, Intermediate, or Advanced) according to workplace risk levels.

Employers must ensure first aid kits are compliant with Regulation 1101, and with CSA Z1220 used to support kit selection, contents, inspection, and maintenance Workplace first aid kits and equipment are selected and maintained in accordance with Regulation 1101, with CSA Z1220 used as the supporting standard for kit contents and classification.

Occupational Health and Safety (OHS)

Occupational Health and Safety (OHS) refers to the practices and systems used to create and maintain a safe and healthy workplace. The goal of OHS is to prevent workplace injuries, illnesses, and fatalities by identifying hazards, assessing risks, and putting safety measures in place.

OHS is guided by laws, regulations, and standards set by the Authority Having Jurisdiction (AHJ). It includes:

1. Hazard identification and risk assessment
2. Emergency preparedness and response
3. Worker training and supervision
4. Ongoing monitoring and improvement of safety practices

Workplace Safety and Insurance Act (WSIA) & Regulation 1101

Under the Workplace Safety and Insurance Act (WSIA) and Regulation 1101, employers in Ontario are legally required to:

- Provide trained first aiders with valid first aid certificates
- Ensure first aid stations and kits meet legal requirements
- Make first aid services available at all times when work is in progress
- Cover all first aid–related costs, including training and supplies

These requirements protect first aiders by ensuring they are:

- Properly trained and legally recognized
- Provided with the equipment and support needed to give safe care

Occupational Health and Safety Act (OHSA)

The Occupational Health and Safety Act (OHSA) establishes the overall legal framework for workplace safety in Ontario. Under OHSA:

- Employers must take every reasonable precaution to protect worker health and safety
- First aid services must be available and accessible
- Workers have the right to refuse unsafe work, including work that places first aiders at unnecessary risk

Legal Protections for First Aiders

First aiders in Ontario are supported and protected by law:

- The Good Samaritan Act protects first aiders who provide care in good faith and without gross negligence
- Employers are required to ensure first aiders are trained, equipped, and supported (WSIA/Reg. 1101)
- First aiders have the right to a safe working environment (OHSA)

WORKPLACE HAZARDS AND RISKS

Hazard

A hazard is anything in the workplace that has the potential to cause harm, injury, or illness to a person. When providing first aid, first aiders may be exposed to the same hazards that caused the injury, as well as new hazards created by the emergency situation.

Examples of hazards a first aider may face:

- Sharp objects such as broken glass, needles, or tools
- Blood and other bodily fluids
- Chemicals or toxic substances
- Hot surfaces, steam, or flames
- Slippery floors or uneven surfaces
- Heavy machinery or moving equipment
- Electrical hazards

Key point: A hazard does not always cause harm — it simply has the potential to do so.

Risk

A risk is the chance that a hazard will cause harm, combined with how serious that harm could be. For first aiders, risk depends on the situation, the environment, and how the first aider responds.

Examples of risks to first aiders:

- Blood exposure → risk of infection if PPE is not used
- Slippery floor → risk of falling while helping an injured person
- Chemical spill → risk of burns or inhalation injury
- Traffic or machinery nearby → risk of being struck or crushed

Key point: Risk considers both the likelihood of harm and the severity of the outcome.

8.1 PRINCIPLES OF HAZARD IDENTIFICATION, RISK ASSESSMENT, AND CONTROL (HIRAC)

Workplace safety relies on a systematic approach to identify hazards, assess risks, control them, and implement safety measures. This process is often called HIRAC.

1. HAZARD IDENTIFICATION

Definition: Recognizing anything in the workplace that could cause harm to people.

Principles:

- Observe work areas regularly.
- Review past incident reports and near misses.
- Identify all types of hazards: physical, chemical, biological, ergonomic, and psychosocial.

Example: Wet floors, unguarded machinery, or chemical storage areas.

2. RISK ASSESSMENT

Definition: Evaluating the likelihood and severity of harm from a hazard.

Principles:

- Consider who might be affected (employees, visitors, contractors).
- Determine how severe potential injuries or illnesses could be.
- Use a risk matrix (likelihood vs severity) to prioritize hazards.

Example: Slippery floor → moderate likelihood, high severity (risk of broken bones).

3. RISK CONTROL

Definition: Implementing measures to eliminate or minimize risks.

Principles:

- Follow the hierarchy of controls:
  - Elimination – remove the hazard entirely.
  - Substitution – replace hazard with something less dangerous.
  - Engineering controls – physical changes to reduce risk (guards, ventilation).
  - Administrative controls – safe work procedures, training, signage.
  - Personal protective equipment (PPE) – gloves, masks, helmets.

Example: Installing anti-slip mats and signage in areas prone to wet floors.

4. IMPLEMENTATION AND MONITORING

Definition: Putting control measures into action and ensuring they work effectively.

Principles:

- Assign responsibilities for safety measures.
- Train staff in safe work practices.
- Conduct regular inspections and audits.
- Review and update procedures after incidents or changes in the workplace.

Example: Regularly checking anti-slip mats, replacing worn PPE, and updating staff on new chemical hazards.

8.2 ROLE OF WORKPLACE FIRST AIDER IN OHSMS

A workplace first aider plays a critical role in ensuring the health and safety of employees by providing immediate care and supporting the overall OHS management system.

1. Immediate Response to Injuries and Illness

- Provide first aid treatment for injuries and sudden illnesses until professional help arrives.
- Stabilize the injured person to prevent worsening of the condition.
- Follow AHJ-approved protocols and workplace procedures.

2. Hazard and Risk Awareness

- Identify hazards and unsafe conditions while providing first aid.
- Report hazards to supervisors or the OHS committee to prevent future incidents.
- Assist in risk assessment by providing insight from incident response experience.

3. Record-Keeping and Reporting

- Document all first aid treatments accurately.
- Maintain incident and injury reports, including:
    - Nature of injury
    - Cause or hazard involved
    - Action taken
- Contribute to OHSMS data, which helps analyze trends and improve safety measures.

4. Participation in OHS Programs

- Participate in safety meetings, drills, and training.
- Support emergency preparedness programs (fire drills, chemical spills, etc.).
- Assist in updating workplace first aid policies and procedures.

5. Promotion of Workplace Safety

- Educate colleagues on basic safety measures and first aid awareness.
- Encourage the use of PPE and safe work practices.
- Act as a role model for safety compliance.

8.3 PRINCIPLES OF OHS LEGISLATION BY AHJ (AUTHORITY HAVING JURISDICTION)

OHS legislation provides the legal framework to ensure that workplaces are safe and healthy. The AHJ ensures that employers, workers, and others comply with these rules to prevent injuries, illnesses, and fatalities.

1. Duty of Care

- Employers and workers have a legal responsibility to maintain a safe workplace.
- Employers must:
  - Provide a safe work environment.
  - Ensure equipment and chemicals are safe.
  - Provide necessary training and supervision.
- Workers must:
  - Follow safe work procedures.
  - Use PPE properly.
  - Report hazards or unsafe conditions.

2. Hazard Identification and Risk Management

- OHS legislation requires workplaces to:
  - Identify potential hazards.
  - Assess the risk of injury or illness.
  - Implement control measures to reduce or eliminate risk.
- AHJ may audit or inspect workplaces to ensure these processes are in place.

3. Consultation and Participation

- Workers have the right to participate in OHS decisions:
  - Safety committees or representatives.
  - Reporting unsafe conditions without fear of retaliation.
- Employers must consult workers on safety policies, procedures, and changes in the workplace.

4. Training and Competency

- Legislation mandates that employees receive:
    - OHS training relevant to their role.
    - Emergency preparedness training (fire, chemical spills, first aid).
- Ensures workers are competent to recognize hazards and respond safely.

5. Reporting and Record-Keeping

- All workplace incidents, injuries, and near misses must be reported and documented.
- AHJ uses these records to:
    - Monitor compliance.
    - Identify trends.
    - Enforce corrective measures.

6. Enforcement and Compliance

- AHJ has the authority to:
    - Inspect workplaces.
    - Issue warnings, fines, or stop-work orders for non-compliance.
    - Ensure adherence to national, regional, or local OHS regulations.

Important Reminder for First Aiders

First aiders provide care based on their knowledge and training. Never attempt a procedure you have not learned or do not remember how to perform. In such cases, call EMS/911 immediately and wait for professional help.

DIFFERENCE BETWEEN FIRST AID AND MEDICAL HELP

- First Aid: The immediate care given by a trained bystander before professional help arrives.
- Medical Help: The advanced care provided by paramedics, nurses, or physicians.

"By providing first aid, you may buy crucial time for medical professionals to arrive—sometimes making the difference between life and death."

WORKING WITHIN YOUR LEVEL OF FIRST AID TRAINING

First aiders must always stay within their trained and certified scope of practice. If a situation requires a skill they are not trained, confident, or authorized to perform, they must not attempt the procedure. Acting outside one's scope can put both the casualty and the responder at risk.

When unsure, the safest choice is to provide only the care you are trained for, call for additional help, and wait for someone with the appropriate level of training or emergency medical services to take over.

8.4 PRINCIPLES AND PROCEDURES FOR MEDICATION ASSISTANCE

First aiders must follow the rules set by the Authority Having Jurisdiction (AHJ) when assisting with any medication. First aiders are not allowed to diagnose, prescribe, or independently administer medication. They may only assist a person with their own prescribed or approved emergency medication when specific conditions are met. The goal is to keep the person safe while respecting legal, policy, and ethical boundaries.

CORE PRINCIPLES

- Assist, don't administer: The person should take their own medication. The first aider only helps when needed.
- Use only their medication: Never give someone else's medication or your own supplies.
- Consent first: The person must agree to use their medication whenever possible.
- Safety first: Check the scene, wear gloves if needed, and call EMS for serious or worsening conditions.

GENERAL PROCEDURES FOR MEDICATION ASSISTANCE

1. Assess the situation: Determine the medical problem (e.g., asthma, allergic reaction, chest pain).
2. Confirm the medication: Ensure it belongs to the casualty, is for the right condition, and is not expired.
3. Get consent: Ask if they want help and if they have used the medication before.
4. Assist with use:
5. Retrieve the medication
6. Prepare the device (inhaler/spacer, auto-injector, etc.)
7. Guide the person without forcing
8. Monitor: Watch for improvement or deterioration, record the time, and stay with them until EMS arrives.

RIGHTS OF MEDICATION

To reduce mistakes when helping someone take medicine, always follow the Five Rights:

1. Right Person
    i Check that the medicine is for the person who will take it.
    ii Ask for their name and verify it on the medicine label.
    iii Do not give the medicine if the names do not match.
2. Right Medicine
    i Ensure the medicine is correct for the situation.
    ii Example: For asthma, an inhaler is the correct medicine.
3. Right Time
    i Give the medicine at the prescribed time.
    ii Follow instructions on the bottle or device about doses and intervals.
4. Right Dose
    i Give the exact amount prescribed.
    ii Example: If the prescription is two tablets, give two — not more or less.
5. Right Route
    i Ensure the medicine is taken the correct way:
    ii Oral: by mouth
    iii Sublingual: under the tongue

Other Important Guidelines

- Always read instructions on labels or devices.
- When unsure, call EMS immediately.
- Check medication storage conditions and expiry dates.
- Never make decisions about dosage changes or medication schedules.
- Never share medication between individuals.
- Record all relevant information and give it to EMS.

Documentation Requirements

Record the following according to AHJ policy:

- Name and type of medication
- Dose taken (if known)
- Time it was taken
- What assistance was provided
- Observed changes in the person's condition
- Actions taken by the first aider

Provide this information to EMS or workplace supervisors.

ASSISTING WITH MEDICATIONS IN ONTARIO WORKPLACES

In Ontario, workplace first aiders are not authorized to provide or administer medications as part of their first aid duties under the Workplace Safety and Insurance Act (WSIA) and Regulation 1101. First aid kits must not contain medications or ointments.

First aiders may assist a person with their own prescribed medication (such as an inhaler or EpiPen) only if:

- The medication belongs to the injured or ill person
- The person requests assistance or is unable to self-administer
- The assistance is allowed by workplace policy and training
- First aiders must always act within their training, follow employer procedures, and call EMS/911 for serious or life-threatening conditions.

Key Point: Workplace first aiders assist — they do not diagnose, prescribe, or give medications.

8.5 SOURCE OF INFORMATION FOR WORKPLACE FIRST AID

SDS (Safety Data Sheet) is a document provided by chemical manufacturers or suppliers that contains detailed information about a chemical substance, including hazards and safety precautions.

In the workplace, SDS is an essential reference for first aid responders because it provides guidance on how to manage exposures safely and effectively.

KEY SECTIONS OF SDS RELEVANT TO FIRST AID

1. Identification
   - i Name of the chemical, manufacturer, and recommended uses.
   - ii Helps first aiders quickly identify the substance involved in an incident.
2. Hazard Identification
   - i Details the chemical's potential dangers (e.g., corrosive, toxic, flammable).
   - ii Alerts first aiders to risks and necessary precautions.
3. Composition / Ingredients
   - i Lists hazardous components, which may affect the type of first aid required.
4. First Aid Measures
   - i Step-by-step instructions for handling exposure through Inhalation (breathing in fumes or dust), Skin contact, Eye contact, Ingestion
   - ii Includes recommended immediate actions, such as rinsing, seeking medical attention, or removing contaminated clothing.
5. Other Relevant Sections
   - i Handling and storage – prevents further exposure.
   - ii Accidental release measures – informs responders how to contain spills safely.

Why SDS is Important for Workplace First Aid

- Provides accurate, chemical-specific guidance for emergency care.
- Helps first aiders avoid making the injury worse.
- Supports employer compliance with health and safety regulations.
- Serves as a training tool to prepare staff for chemical emergencies.

8.6 FIRST AID KITS

Feature	Home First Aid Kit	Workplace First Aid Kit
Purpose	Basic care for common household injuries and illnesses	Comprehensive care for a wider range of injuries, including workplace-specific risks
Size & Cost	Smaller, inexpensive, widely available in stores	Larger, varies in size and cost depending on workplace needs
Contents	Bandages, antiseptic wipes, adhesive tape, pain relievers, thermometer, etc.	All items from home kits plus advanced supplies (e.g., eye wash, burn dressings, CPR mask, trauma supplies)
Accessibility	Usually stored in kitchens, bathrooms, or cars	Required by law to be easily accessible in designated areas of the workplace
Responsibility	Family members ensure it is stocked	Employers are legally responsible for stocking, maintaining, and providing access
Training	No formal training required	Training required for designated first aiders to use contents appropriately

Training and Use

During this course, you will learn about the items commonly found in first aid kits and how to use them effectively. After this course, at your workplace or school where you spend most time of your day familiarize yourself where the first aid kit is and if anything needs to be replaced. Make sure you know how to use the contents safely and correctly.

AHJ REQUIREMENTS FOR FIRST AID KIT CONTENT AND EQUIPMENT

The AHJ sets standards to ensure first aid kits and equipment are appropriate for the workplace or environment, number of personnel, and type of hazards present. Requirements may vary slightly depending on local regulations, but general guidance includes:

1. **Basic Supplies**
   - i Every first aid kit should include items to treat minor injuries and stabilize serious conditions until professional help arrives:
   - ii Dressings and bandages (Adhesive bandages, Sterile gauze pads, Sterile dressings for large wounds, Roller bandages)
   - iii Adhesive tape
   - iv Antiseptic solutions/wipes
   - v Burn dressings or gel
   - vi Eye wash or saline solution
   - vii Gloves (non-latex if required)
   - viii Scissors, tweezers, and safety pins
2. **CPR and Emergency Equipment**
   - i Resuscitation masks / pocket masks
   - ii Automated External Defibrillator (AED) (if required by the AHJ)
   - iii Barrier devices for safe rescue breathing
   - iv Emergency blankets (to prevent shock or hypothermia)
3. **Additional Items for Special Environments**
   - i Depending on workplace hazards, additional items may be required:
   - ii Splints and cold packs for injuries
   - iii Chemical burn kits for laboratories
   - iv Eye protection or face shields
4. **Maintenance and Accessibility**
   - i First aid kits must be easily accessible and located near work areas.
   - ii Kits should be checked regularly to ensure items are complete, clean, and not expired.
   - iii Contents should be clearly labeled and appropriate for the number of employees.

EMPLOYER'S RESPONSIBILITY

Employers are responsible for ensuring that all employees, including full-time, part-time, temporary, off-site, and mobile workers—have always access to adequate and appropriate first aid supplies. Workplace first aid kits and equipment must meet the requirements set by the Authority Having Jurisdiction (AHJ), such as provincial/territorial regulations, WSIB, or other governing bodies. The AHJ determines what items must be included in each kit based on the type of work performed, number of employees, and level of workplace risk.

Employers must ensure that all first aid kits are:

- Easy access
- Fully stocked and maintained
- Regularly inspected and replenished
- Located in designated, clearly marked areas

First aiders must know where workplace kits and equipment are stored and should use only the items they are trained and authorized to use.

Case Scenario*: Maria is working at a retail store when a coworker injures their hand. She immediately retrieves the workplace first aid kit, finds sterile gauze and tape, and applies a bandage. Because she already knew where the kit was located and how to use it, Maria was able to respond quickly and effectively.*

8.7 AFTER-INCIDENT PROCEDURES

After a first aid incident, responders have important duties beyond providing medical care. These responsibilities help protect the workplace, support investigations, maintain equipment readiness, and ensure accurate documentation for safety and legal compliance.

1: SECURING THE SCENE

- Allow Authorities to Complete Their Investigation: If an incident involves serious injury, a hazardous situation, or a potential violation of workplace regulations, external authorities such as police or the Ministry of Labour may need to investigate the scene.
- Do not touch, move, or clean anything until investigators confirm that the area can be released. This protects evidence, maintains legal integrity, and ensures an accurate understanding of what occurred.

2: CLEANING, DISINFECTION, AND RESTOCKING

Once authorities have cleared the scene:

1. Put on the required Personal Protective Equipment (PPE), including gloves, a mask, eye protection, and a gown or apron if there is a risk of splashing.
2. Collect all cleaning supplies, disinfectants, absorbent materials, and biohazard waste bags before starting. Make sure the area is well-ventilated, and limit access to prevent others from entering the contaminated zone.
3. Use disposable absorbent materials such as paper towels or absorbent pads to gently blot and soak up blood or body fluids. Avoid wiping aggressively — this can spread contamination to a larger area.
4. Place all used absorbent materials directly into a biohazard waste bag without shaking or compressing them. Take care to prevent splashing or spreading fluids onto clean surfaces or equipment.
5. Apply a general cleaning solution (such as soap and water or an employer-approved surface cleaner) to break down dirt and organic material.
6. Use disposable cloths or wipes, and avoid reusing cleaning tools on other areas to prevent cross-contamination.

Disposal of Sharps

- What Counts as Sharps?
    - Sharps include Needles, Lancets, Razor blades, Broken glass, Any object capable of puncturing the skin. These items can cause injuries and spread infections if handled improperly.
- Principles of Sharps Disposal
    - Never recap, bend, or break needles or sharp items.
    - Always treat sharps as contaminated, even if they appear unused.
    - Handle sharps using tools (e.g., tongs) when possible, not bare hands.
    - Store sharps containers in easily accessible but secure locations.

Disposal of Other Contaminated Materials

- Contaminated items may include:
    - Gloves
    - Gauze and dressings
    - Bandages
    - PPE
    - Paper towels
    - Cleaning wipes
- Disposal Procedure
    - Place all contaminated materials directly into biohazard bags.
    - Seal bags tightly to prevent leaks.
    - Label bags if required by workplace policy.
    - Transport to designated biohazard disposal sites.

Restock All First Aid Supplies

A first aid kit must always be ready for the next emergency. After an incident:

- Replace gloves, dressings, bandages, masks, and any used tools.
- Check expiration dates on items that remain in the kit.
- Refill specialty supplies such as ice packs, gauze rolls, and disinfectant wipes.
- Maintaining a fully stocked, clean, and functional first aid kit supports rapid response in future emergencies.

Supplies Required for Cleaning and Disinfection

1. Personal Protective Equipment (PPE)
    i Disposable gloves
    ii Masks or respirators (as needed)
    iii Safety goggles or face shields
    iv Protective aprons or gowns
2. Cleaning Materials
    i Mild detergents or cleaning solutions
    ii Warm water
    iii Soft cloths or disposable wipes
    iv Paper towels
    v Scrub brushes
3. Disinfection Supplies
    i Hospital-grade disinfectant sprays or wipes
    ii Diluted bleach solution (if approved by workplace policy)
    iii Alcohol-based disinfectants (where appropriate)
4. Waste Disposal Materials
    i Biohazard waste bags
    ii Sharps containers
    iii Sealed garbage bags or containers
5. Storage and Maintenance Supplies
    i Clean bins or containers for dry storage
    ii Labels for tracking cleaning dates
    iii Replacement PPE and cleaning wipes
    iv Inventory logs and checklists

Equipment and Surfaces Requiring Routine Cleaning

The following items should be cleaned and disinfected after each use or daily in high-use workplaces:

- First aid room counters and work surfaces
- Treatment beds, cots, and chairs
- Scissors, tweezers, and splints
- Reusable face shields or pocket masks
- Blood pressure cuffs and stethoscopes
- Ice pack covers or cold compress holders
- Flashlights, radios, and other handheld tools
- First aid kit compartments and outer cases

Clean and disinfected first aid equipment protects both responders and injured individuals. By following the principles and procedures outlined in this chapter—and using appropriate supplies—workplace responders ensure that every first aid intervention is delivered in a safe, hygienic, and professional manner.

3: REPORTING AND DOCUMENTATION

Accurate, timely documentation is essential for compliance, follow-up care, and safety improvements.

Required Information to Record: Incident reports should capture clear and complete details, including:

1. What happened: A factual description of the event
2. Worker's condition: Symptoms, injuries, or observations
3. First aid provided: All treatments, steps taken, and equipment used
4. Witness information: Names and contact details of anyone who saw the incident
5. Activation of EMS: Whether 911 was called and what information was provided

Importance of Accurate Documentation, Proper reporting helps:

1. Support legal and regulatory compliance
2. Inform safety committee reviews and prevention strategies
3. Provide continuity of care if the worker seeks medical treatment
4. Protect both the employee and employer by creating a factual record
5. Incident forms must be completed according to organizational policy and stored securely.

4: MANAGING CRITICAL INCIDENT STRESS

Emotional Impact of Emergencies: Serious injuries, sudden medical events, or traumatic scenes can affect not only the injured worker but also responders and bystanders. It is normal to experience stress reactions such as:

- Difficulty sleeping
- Anxiety
- Trouble concentrating
- Emotional numbness or irritability

Steps to Support Mental Well-Being, After a challenging incident:

1. Debrief with co-workers or supervisors in a supportive, non-judgmental environment.
2. Access employee support programs, such as workplace mental health services or community counseling.
3. Monitor your own well-being in the days and weeks after the event.
4. Seek professional help early if symptoms persist or interfere with daily life.
5. Recognizing and addressing stress early helps maintain long-term health and workplace resilience.

Post-incident responsibilities are a crucial part of workplace first aid. Securing the scene, cleaning and restocking supplies, completing accurate documentation, and attending to emotional well-being all contribute to a safer and more supportive work environment. By following these procedures, responders ensure compliance, protect themselves and others, and promote ongoing workplace safety.

Chapter 9: General Medical Emergencies

LEARNING OBJECTIVES

1. Recognize and provide first aid for acute emergencies like fainting, dizziness, seizures, and diabetic crises.
2. Understand chronic conditions such as diabetes and manage related emergencies safely.
3. Identify and assist with childbirth, miscarriage, and abnormal deliveries until EMS arrives.
4. Recognize psychological emergencies, self-harm, and suicide risk; provide safe first aid.
5. Know when to call EMS 911, monitor vital signs, and offer emotional support.

Case Scenario: *You are at a family gathering when a child suddenly starts shaking violently on the floor, foaming at the mouth, and appears unconscious. What would you do?*

Acute and Chronic Medical Emergencies

A medical emergency can happen suddenly and may require immediate care. Emergencies are broadly divided into acute and chronic illnesses.

- Acute Illness: These develop quickly and last for a short time. They may or may not be severe but require urgent attention. Examples include fainting, seizures, childbirth, or miscarriage.
- Chronic Illness: These are long-term conditions that a person lives with, often requiring ongoing treatment. Chronic does not mean life-threatening; it means the illness is ongoing. Examples include diabetes, high blood pressure, or asthma.

Environmental Injury or Illness

Environmental injury or illness refers to any harm to the body caused by conditions in the surrounding environment, rather than by disease or internal medical problems. The human body works best at an internal temperature of about 37°C (98.6°F). The body constantly balances heat gain and heat loss through a process called thermoregulation, controlled by the hypothalamus, a part of the brain that acts like a thermostat.

- When the body becomes too warm, blood vessels in the skin widen (dilate), allowing more blood to flow near the surface. This helps release excess heat through sweating and evaporation.
- When the body becomes too cold, blood vessels narrow (constrict), reducing blood flow near the surface and conserving body heat. Muscles begin to shiver, which generates heat through movement.

9.1 FAINTING (SYNCOPE)

Fainting is a temporary, sudden loss of consciousness that usually lasts for a few minutes. It occurs when the brain does not receive enough oxygen. Most fainting episodes are brief, and the person recovers on their own, but first aid may be necessary to prevent injury or complications.

Common Causes of Fainting:

- Pregnancy
- Severe pain
- Hot or humid environments
- Dehydration or not drinking enough fluids
- Skipping meals leading to low blood sugar
- Standing in one position for too long
- Intense emotions, such as excitement or fear
- Traumatic news or shock

Signs and Symptoms:

- Pale, cold, or sweaty skin
- Feeling dizzy or light-headed
- Nausea or upset stomach
- Weakness or blurred vision before fainting

FIRST AID FOR FAINTING

1. If you notice a person about to faint (impending faint): Have them lie down immediately to prevent falling and injury.
2. Positioning: Raise their legs about 12 inches above heart level to improve blood flow to the brain.
3. Loosen restrictive clothing: Remove tight belts, collars, ties, or any clothing that may restrict circulation.
4. Provide fresh air: If indoors, open windows or use a fan to circulate air.
5. Recovery: When the person regains consciousness, help them sit up slowly to prevent another fainting episode.
6. Medical follow-up: Encourage them to see a healthcare provider, especially if fainting happens repeatedly.
7. If unconscious for more than a minute: Place them in the recovery position (on their side) to keep the airway clear.
8. Call for emergency services: Dial EMS 911 immediately and ask someone to bring an AED if available.
9. Monitoring: Recheck ABCs (Airway, Breathing, Circulation) every two minutes. Treat for shock if needed by keeping them calm and covered.
10. If the person stops breathing: Begin CPR immediately and continue until professional help arrives.

Key Points to Remember:

- Fainting can be minor or a sign of a more serious problem.
- Prevent injury by laying the person down as soon as possible.
- Never let the person get up too quickly after fainting.
- Always monitor breathing, pulse, and level of consciousness.
- Early EMS intervention is better if the fainting episode is prolonged, repeated, or associated with other serious symptoms.

9.2 DIZZINESS

Dizziness is a feeling of light-headedness, imbalance, or nearly fainting. A person may also experience sensations of floating, swimming, or spinning (vertigo).

Common Causes:

- Certain medications
- Alcohol consumption
- Migraines
- Inner ear disorders that affect balance
- Vertigo or other neurological issues

Key Point: Dizziness is not a disease itself but a symptom of various underlying conditions.

FIRST AID FOR DIZZINESS:

1. Have the person sit or lie down immediately.
2. Advise them to avoid sudden movements or changes in position.
3. Offer fluids if they are thirsty.
4. Take a brief medical history to rule out any urgent condition.
5. Reassure the person and suggest follow-up with their doctor.

9.3 SEIZURES

A seizure is a sudden, uncontrolled electrical disturbance in the brain. This can affect:

- Movements: causing jerking or stiffening of muscles.
- Consciousness: making the person appear unaware or unconscious.
- Behavior and sensations: changing how the person feels, sees, or reacts temporarily.

Seizures can happen in anyone, from infants to adults, and are sometimes brief or may last several minutes.

COMMON CAUSES OF SEIZURES

Seizures can occur due to various reasons, including:

- Epilepsy: A chronic condition where seizures occur repeatedly.
- Low blood sugar (Hypoglycemia): Often seen in people with diabetes who miss meals or take too much insulin.
- Oxygen deficiency: Conditions like drowning or choking.
- Stroke: Blood flow interruption in the brain.
- Heatstroke: Overheating can trigger seizures.
- Head injuries: Trauma to the brain.
- Drug overdose or withdrawal: Certain medications or illegal drugs.
- Alcohol withdrawal: Sudden stopping in a person who regularly consumes alcohol.
- Electrolyte imbalances: Low or high levels of salts like sodium or potassium.
- High fever in children: Sudden rise in body temperature can trigger seizures.

***Note**: Sometimes seizures occur without any known cause.*

SIGNS AND SYMPTOMS OF SEIZURES

Seizures can look different depending on type, but common signs include:

- Staring spells or blank look
- Eyes rolling upward
- Clenched jaw
- Drooling or foaming at the mouth
- Loss of bladder control
- Pale, sweaty skin
- Irregular or fast breathing
- Jerking movements of arms and legs
- Temporary unconsciousness

FIRST AID DURING A SEIZURE

If someone is having a seizure:

1. Keep them safe: Move furniture or objects that could injure them.
2. Protect their head: Place a soft item like a pillow or folded cloth under the head.
3. Do not restrain: Allow natural movements unless they are in danger.
4. Do not put anything in the mouth: This can cause injury or choking.

After the Seizure

1. Check vital signs: airway, breathing, circulation (ABCs).
2. Loosen tight clothing, especially around the neck.
3. Place the person in recovery position: on their side to allow saliva or vomit to drain safely.
4. Do not give food or drinks immediately.
5. Most seizures last only a few minutes and resolve without complications.

When to Call EMS 911 and Get an AED

Call emergency services if:

- The person's medical history is unknown
- Seizure lasts more than 3 minutes or repeats
- The person appears injured
- The person is pregnant or diabetic
- Seizure occurs in water
- The person does not regain consciousness promptly

Additional Notes:

- Some people feel a warning sensation (aura) before a seizure. This can allow them to lie down safely.
- Continuously monitor ABCs.
- If the person stops breathing, begin CPR immediately.

FEBRILE SEIZURES (IN CHILDREN)

Febrile seizures occur when a child's body temperature rises rapidly, often above 40°C (104°F).

During the Seizure:

1. Do not restrain the child; guide movements safely.
2. Remove dangerous objects nearby.

After the Seizure:

1. Most febrile seizures are short and not life-threatening.
2. Remove excess clothing.
3. Give fever-reducing medication like acetaminophen or ibuprofen (avoid aspirin).
4. If no medication is available, use a sponge bath with room-temperature water, not cold water immersion.
5. Encourage fluids to prevent dehydration.

Call EMS 911 if:

- It's the child's first febrile seizure
- Seizure lasts longer than 5 minutes or repeats
- Seizure follows a sudden temperature rise

FEVER EMERGENCY

Definition: Infants: armpit temperature above 38°C (100.5°F) & Children: armpit temperature above 40°C (104°F)

Importance:

- Rapid rise in temperature can trigger febrile seizures.
- Prompt cooling, hydration, and monitoring are crucial.
- Seek medical care if the temperature remains high or seizures occur.

Complications During Seizures

- Injury: From falling, hitting objects, or self-harm during convulsions.
- Aspiration: Breathing in saliva, vomit, or fluids can cause choking or pneumonia.
- Brain damage: Prolonged seizures (status epilepticus) can cause permanent harm.

9.4 DIABETIC EMERGENCIES

WHAT IS DIABETES?

Diabetes is a condition where the body has trouble controlling blood sugar (glucose) levels. Glucose comes from the food we eat and is the main source of energy for our cells. Normally:

- After eating, glucose enters the bloodstream.
- The pancreas produces a hormone called insulin.
- Insulin allows glucose to move from the blood into cells.
- Cells use glucose along with oxygen to produce energy for daily activities.

In a person with diabetes, glucose cannot enter most cells properly, leaving them "hungry," while the blood contains too much sugar. Brain cells are an exception—they can absorb glucose without insulin.

Over time, untreated high blood sugar can slowly damage nerves, eyes, kidneys, and other organs. This is why diabetes is sometimes called a "silent killer." If not managed, it can lead to a serious condition called diabetic coma.

TYPES OF DIABETES

1. Type 1 Diabetes
   - i An autoimmune disease where the immune system destroys insulin-producing cells in the pancreas.
   - ii People with type 1 diabetes need insulin injections to survive.
   - iii About 10% of people with diabetes have type 1.
2. Type 2 Diabetes
   - i The body either does not make enough insulin or cannot use it properly.
   - ii Managed through diet, exercise, oral medication, and sometimes insulin.
3. Gestational Diabetes
   - i Occurs during pregnancy.
   - ii Hormones from the placenta block insulin, causing high blood sugar.
   - iii Usually resolves after childbirth but increases future risk of type 2 diabetes.

HYPERGLYCEMIA (HIGH BLOOD SUGAR)

Diabetic emergencies occur when diabetes is not properly controlled, either due to missed medication, incorrect diet, or other factors.

Definition: Blood sugar rises too high because insulin is insufficient or ineffective.

Causes:

- Skipping medication
- Eating sugary foods
- Lack of exercise
- Stress (physical or emotional)

What happens in the body:

Cells cannot get glucose for energy. Body starts breaking down fats and proteins for energy. This creates waste products like ketones, which make the breath smell fruity or like nail polish remover.

Signs of Hyperglycemia:

- Develops gradually over days
- Gradual confusion or decreased responsiveness
- Lethargy, restlessness
- Flushed, dry, warm skin
- Fruity-smelling breath
- Increased thirst and dry mouth
- Abdominal pain

Important Note: *Hyperglycemia usually develops slowly and is less likely to be an immediate life-threatening emergency, but it must be managed promptly to prevent severe complications. Do not give insulin or other blood sugar-lowering medications. If hyperglycemia is suspected, follow EMS instructions for safe care.*

HYPOGLYCEMIA (LOW BLOOD SUGAR)

Definition: Blood sugar drops too low, often because the person missed a meal, over-exercised, or took too much insulin.

Why it's dangerous:

1. Brain cells depend on glucose to function.
2. Lack of glucose can quickly lead to confusion, unconsciousness, or brain damage.
3. This is also called insulin shock.

Signs of Hypoglycemia:

- Develops rapidly within minutes
- Sudden confusion or unconsciousness
- Pale, sweaty, cool skin
- Irritable or aggressive behavior
- Dizziness, fainting, headache
- Odorless breath

Important: *When in doubt, give sugar, because it is safer to raise blood sugar quickly than to risk brain damage from low sugar.*

FIRST AID FOR A DIABETIC EMERGENCY

Before giving first aid, try to determine if the person has diabetes:

- Ask the patient or family members
- Look for Medical Alert bracelets or necklaces

If the Patient is Conscious

1. Have them sit down safely to prevent falls if they become unconscious.
2. If they can swallow safely, give sugary drinks: fruit juice, water with dissolved sugar, or soft drinks.
3. Avoid hard-to-swallow solids like candies or honey, as choking is possible.
4. After improvement, recommend a complete meal.
5. If the condition worsens or does not improve in 10 minutes:
   i Call EMS 911
   ii Give more sugar
   iii Reassure the patient while waiting for help

If the Patient is Unconscious

1. Call EMS 911 immediately and ask someone to bring an AED.
2. Check ABCs (Airway, Breathing, Circulation).
3. If breathing is present:
   i Place the patient in recovery position
   ii Monitor ABCs continuously
   iii Treat for shock until help arrives
4. If not breathing, start CPR immediately.

Key Points

- Diabetes is a chronic condition that affects blood sugar regulation.
- Both high and low blood sugar can cause serious emergencies.
- Hypoglycemia is fast-acting and often life-threatening.
- Hyperglycemia is slower but can lead to long-term complications if untreated.
- Immediate first aid can save lives: give sugar if unsure.
- Always seek professional medical help if symptoms do not improve quickly or if the person is unconscious.

DIFFERENCES:

Feature	Hyperglycemia (High Blood Sugar)	Hypoglycemia (Low Blood Sugar)
Definition	Blood sugar is too high; cells cannot use glucose properly	Blood sugar is too low; brain and body cells do not get enough glucose
Onset	Gradual (develops over hours or days)	Rapid (develops within minutes)
Causes	Missed medication, poor diet, lack of exercise, stress	Skipped meals, over-exercise, too much insulin, alcohol
Level of Consciousness	Gradually decreases; confusion or lethargy	Sudden confusion, irritability, can become unconscious quickly
Skin Appearance	Flushed, warm, dry	Pale, cool, sweaty
Breath Odor	Fruity or like nail polish remover (acetone)	Odorless
Common Complaints	Thirst, dry mouth, abdominal pain	Dizziness, fainting, headache
Risk	Long-term damage to nerves, eyes, kidneys; diabetic coma	Immediate risk of brain damage or death if untreated
First Aid	Call EMS if severe; maintain hydration; monitor ABCs; do not give insulin	Give sugary drinks (juice, sugar dissolved in water); sit patient safely; call EMS if no improvement; monitor ABCs
Recovery	Slower; may require medical treatment and insulin adjustment	Rapid if sugar is given promptly; patient usually recovers quickly

9.5 PSYCHOLOGICAL EMERGENCIES

A psychological emergency occurs when a person's behavior becomes abnormal or dangerous to themselves or others. It can be caused by mental illness, medical conditions, or substance use.

Types of Mental Health Emergencies

A mental health emergency happens when a person's thoughts, feelings, or behaviors put themselves or others at immediate risk. Some common types include:

- Suicidal thoughts or attempts – when someone thinks about or tries to end their life.
- Severe panic attacks – intense fear, rapid heartbeat, shortness of breath, or feeling out of control.
- Psychotic episodes – confusion, hallucinations (seeing or hearing things that aren't real), or delusions (strong false beliefs).
- Severe aggression or violence – threatening harm to self or others.
- Extreme depression or anxiety – inability to function normally, self-neglect, or inability to stay safe.
- Substance-induced crises – reactions to alcohol or drugs causing dangerous behavior or confusion.

Substance Use

Substance use means taking or consuming a substance such as alcohol, medications, or drugs. This includes drinking alcohol, taking prescribed or over-the-counter medicines, or using recreational substances.

Key point: Substance use is not always harmful when substances are used as directed or in moderation.

Substance Misuse

Substance misuse occurs when a substance is used incorrectly or in a way that causes harm. This includes using more than recommended, taking someone else's medication, using substances for unintended purposes, using illegal substances, or continuing use despite negative effects on health, safety, work, or daily life.

Key point: Substance misuse increases the risk of injury, illness, addiction, and unsafe behavior..

Recognizing a Mental Health Emergency

It is important to spot the warning signs early. Some signs include:

- Behavioral signs:
    - Sudden aggression or agitation
    - Withdrawal from friends, family, or activities
    - Self-harm or reckless behavior
- Emotional signs:
    - Extreme sadness, hopelessness, or despair
    - Intense fear or panic
    - Rapid mood swings
- Cognitive signs:
    - Confusion or disorientation
    - Hearing or seeing things that aren't real
    - Talking about death or wanting to harm themselves or others

Any sudden change in behavior or mood, especially if accompanied by threats to self or others, is an emergency.

First Aid for Psychological Emergencies

1. Ensure your own safety first. Do not enter if you feel unsafe.
2. Call EMS 911 if the person poses a risk to themselves or others.
3. Keep a safe distance — stay at least six feet away.
4. Approach calmly and slowly. Sudden movements may frighten them.
5. Do not argue, threaten, or challenge the person.
6. Speak softly and reassuringly. Use phrases like,
    i "I am here to help."
    ii "You are not alone."
7. Maintain eye contact (without staring). It helps build trust and lets you observe their emotional state.
8. Avoid touching the person unless absolutely necessary for safety.
9. If a weapon is present, do not attempt to take it. Move away and wait for the police.
10. Listen with empathy — allow them to express feelings without judgment.
11. Do not attempt to diagnose their condition. Focus on keeping them calm and safe.

SELF-INFLICTED INJURIES

A self-inflicted injury is when a person intentionally harms their body, not to die but to cope with emotional distress, anger, or pain.

Common Forms:

- Pulling out hair.
- Scratching or cutting the skin.
- Interfering with healing wounds.
- Hitting or punching oneself.
- Drinking harmful liquids or swallowing dangerous items.
- Jumping from heights or exposing themselves to toxins.

First Aid:

1. Ensure your safety first.
2. Call EMS 911 for immediate medical and psychological support.
3. Control any bleeding using direct pressure with a clean cloth.
4. Do not judge or criticize. Offer reassurance.
5. Stay with the person until professional help arrives.
6. Encourage talking about feelings once they are calm.
7. If the person becomes aggressive, move to safety and call police support.

Complications During Psychological or Self-Harm Emergencies

- Violence: The person may harm themselves or others.
- Accidental injury: Scratching, cutting, or hitting oneself may lead to infection or bleeding.
- Suicide attempts: Immediate risk of death.
- Emotional trauma: Both the patient and bystanders may experience stress or fear.

SUICIDE

Suicide is a deliberate act to end one's own life. It can result from severe depression, loss, mental illness, or unbearable stress.

Warning Signs:

- Talking about wanting to die or having no reason to live.
- Saying goodbye or giving away personal belongings.
- Writing a will unexpectedly.
- Withdrawing from friends or family.
- Sudden calmness after severe depression (may indicate decision to act).

First Aid for Suicide Risk

1. Take every threat seriously.
2. Call EMS 911 immediately.
3. Do not leave the person alone. Stay until help arrives.
4. Listen with compassion. Avoid arguing or judging.
5. Remove possible means of self-harm if safe to do so (sharp objects, medications, etc.).
6. Reassure the person that help is available and their life has value.
7. If trained, contact mental health crisis services or hotlines for immediate guidance.

Important: Never promise confidentiality if someone expresses suicidal thoughts — it's essential to involve professionals.

OCCUPATIONAL STRESS INJURY (OSI)

Occupational Stress Injury occurs when work-related stress harms mental, emotional, or physical health. First aiders are at risk due to exposure to trauma, emergencies, and high-pressure situations.

Causes: traumatic incidents, aggressive individuals, long hours, heavy workload, lack of support.

Effects: anxiety, depression, fatigue, sleep problems, poor concentration, withdrawal.

Signs include:

- Persistent sadness, fear, or anger
- Trouble sleeping or nightmares
- Loss of interest in work or hobbies
- Difficulty focusing or making decisions
- Feeling overwhelmed
- Increased substance use

Self-Care Management

- Physical: breaks, healthy meals, exercise, rest.
- Emotional: talk about experiences, practice relaxation, acknowledge feelings.
- Professional: counseling, debriefings, mental health training.
- Work Habits: set boundaries, prioritize tasks, ask for help.

Key Point: *Early recognition and self-care help first aiders stay resilient, healthy, and effective.*

OPIOID OVERDOSE

Opioids are a type of medicine used to relieve severe pain. Common prescription opioids include oxycodone and morphine. Heroin is also an opioid, but it is illegal in Canada because it has a high risk of addiction and dangerous side effects.

In Canada, opioid addiction and overdoses have become serious problems. People may overdose by using drugs such as heroin, oxycodone, or fentanyl. When a person takes too much of an opioid, or mixes it with other substances like alcohol or sleeping pills, their breathing and heart rate can slow down or stop completely. This can lead to respiratory arrest (not breathing) and cardiac arrest (no heartbeat), both of which can cause death if help is not given immediately.

Signs of Opioid Overdose:

- Slow or no breathing
- Unresponsive to voice or pain
- Pale face, blue lips
- Snoring sounds
- Vomiting
- Cold, damp skin
- Small pupils

Treatment:

Naloxone is a medicine that can quickly reverse the effects of an opioid overdose (like heroin, morphine, or oxycodone). It works fast, especially when given through the nose (intranasal), but it can also be given by injection (intramuscular or intravenous).

Important: *Naloxone should only be used by someone trained to give it.*

First Aid Steps for Opioid Overdose:

1. Call EMS 911 and ask someone to bring an AED.
2. Check responsiveness and ABCs (Airway, Breathing, Circulation).

9.6 DROWNING EMERGENCY

Drowning is a life-threatening condition that occurs when a person's airway becomes submerged in water, preventing oxygen from reaching the lungs and brain. Lack of oxygen for even 4–6 minutes can cause permanent brain damage or death. Drowning can happen in oceans, pools, bathtubs, lakes, rivers — even shallow water — and affects both adults and children.

Causes of Drowning

- Inability to swim or exhaustion while swimming.
- Slipping or falling into deep or cold water.
- Alcohol or drug use near water.
- Medical emergencies such as seizures or heart attack while swimming.
- Not wearing a life jacket during boating.
- Cold water immersion (can cause muscle cramps or shock).

Signs and Symptoms

- Head low in the water, mouth at water level.
- Arms flailing or struggling to stay above the surface.
- Weak or no response when called.
- Blue or pale lips and face (sign of lack of oxygen).
- Slow or absent breathing.
- Unconsciousness.

Prevention of Drowning

- Always supervise children near water — never leave them unattended.
- Learn basic swimming and water survival skills.
- Avoid alcohol or drugs when swimming or boating.
- Wear a life jacket during water activities.
- Obey warning signs and lifeguard instructions.
- Never dive into unknown or shallow water

FIRST AID FOR DROWNING

1. Ensure your safety first.
   i Do not enter the water unless you are trained in water rescue.
   ii Use an object like a rope, pole, or flotation device to reach or throw to the person.
   iii If available, ask a lifeguard for help.
2. Call EMS (911) immediately.
3. After rescue:
   i Place the person on a firm, flat surface.
   ii Check for breathing and pulse (ABCs).
   iii If not breathing, start CPR immediately — give 30 chest compressions and 2 rescue breaths, and continue until help arrives.
4. If the person is breathing but unconscious:
   i Place them in the recovery position (on their side).
   ii Keep them warm and monitor breathing continuously.
5. If water was inhaled:
   i Encourage the person to cough and breathe deeply.
   ii Remove wet clothing and cover with a blanket.
6. Never try to drain water from the lungs by pressing the abdomen or lifting the person upside down — it wastes critical time and can worsen injury.

Complications of Drowning

- Lung infection (aspiration pneumonia)
- Brain damage due to oxygen deprivation
- Cardiac arrest
- Secondary drowning (fluid accumulation in lungs hours later)
- Death.

PROSAVER WORKPLACE FIRST AIDER COMPETENCIES

ProSaver's Basic First Aid program outlines the core emergency response competencies required for workplace first aiders who may be the first to respond when an injury or sudden illness occurs. These competencies are designed to help learners develop a strong foundation of knowledge, practical first aid skills, and the confidence needed to act quickly and safely during workplace emergencies.

Basic First Aid training focuses on recognizing medical emergencies, ensuring scene safety, performing a basic assessment of the injured or ill person, and activating emergency medical services (EMS) without delay. Learners are trained to provide immediate, appropriate first aid care for common workplace emergencies, including breathing and cardiac emergencies, severe bleeding, shock, allergic reactions, and other life-threatening conditions.

All Basic First Aid competencies are aligned with CSAZ1210:24 standards, Canadian occupational health and safety legislation, WSIB Regulation 1101, and recognized first aid standards. The program supports regulatory requirements and workplace risk levels while emphasizing personal safety, infection prevention, and legal responsibilities. Training prepares first aiders to stabilize the person, prevent conditions from worsening, and continue care until professional medical help arrives or the situation can be safely managed.

Basic First Aid Competencies

Intended for: Low-risk workplaces or workplaces with limited personnel

Primary focus: Immediate life-saving actions and essential emergency response skills

Knowledge Competencies:

Learners will demonstrate understanding of:

1. Define workplace first aid, first aider roles, consent, scope, and protections.
2. Identify medication-assist principles and first aid kit requirements.
3. Explain EMS activation, handover, and documentation requirements.
4. Identify communication barriers.
5. Identify workplace hazards, risks, and disease transmission routes.
6. Identify PPE types and cleaning/disinfection procedures.
7. Describe sharps disposal and scene cleanup procedures.
8. Define hazard and risk.
9. Demonstrate awareness of hazard identification, SDS use, and OHS legislation.
10. Describe first aider role in OHS systems.
11. Demonstrate awareness of medical history, vital signs, and head-to-toe assessment.
12. Describe airway manoeuvre indications.
13. Identify circulatory system basics.
14. Identify shock definition and signs.
15. Demonstrate awareness of two-rescuer CPR.
16. Recognize external and internal bleeding.
17. Identify ear, eye, nose injury signs.
18. Identify burn types, classifications, and signs.
19. Demonstrate awareness of anaphylaxis, diabetes, seizures, stroke, mental health emergencies, substance misuse.
20. Demonstrate awareness of transport procedures, criteria, and triage.
21. Identify spinal precautions and signs of spinal injury.
22. Demonstrate awareness of suspected spinal fracture management.
23. Demonstrate awareness of two-rescuer infant and child CPR.

Practical Skills Competencies:

Learners will competently perform:

1. Perform scene assessment.
2. Obtain incident information.
3. Assess level of consciousness.
4. Assess airway, breathing, and circulation.
5. Identify life-threatening conditions.
6. Perform ongoing reassessment.
7. Open, clear, and maintain airway.
8. Provide care for respiratory emergencies.
9. Provide care for cardiovascular emergencies.
10. Perform one-rescuer adult CPR.
11. Use an AED.
12. Control external hemorrhage.
13. Perform one-rescuer infant and child CPR.
14. Demonstrate proper donning and doffing of PPE.

Performance Expectations:

- Confident and accurate execution of essential life-saving actions
- Ability to maintain casualty stability until professional responders arrive
- Effective teamwork and communication in emergency conditions

Documentation of Course Content and Competency Verification

To ensure consistency and compliance with CSA Z1210:24 standards, ProSaver will maintain comprehensive documentation for each course level, including:

- Defined learning objectives and competency outcomes
- Instructor lesson plans and delivery standards
- Practical skill checklists and evaluation rubrics
- Written assessments to measure knowledge retention
- Performance benchmarks for safe and competent practice
- Participant progress records and certification eligibility criteria

Competency Mastery is Verified Through:

1. Instructor evaluation of practical performance
2. Successful completion of scenario-based skill assessments
3. Minimum passing grade on written evaluations (where applicable)
4. Demonstrated readiness to perform workplace first aid safely and effectively

All assessments will be administered using standardized procedures, evaluation tools, and performance criteria to ensure consistent application across instructors, courses, and delivery formats, and to maintain alignment with the identified competencies and established competency-based assessment principles.

ACKNOWLEDGEMENT AND APPRECIATION

ProSaver extends its sincere appreciation to every individual who has contributed to the development of this guide. The dedication, expertise, and collaborative effort of our instructors, Master Instructors, Program Leaders, subject matter experts, and administrative teams have been essential in shaping a comprehensive and future-ready First Aid & CPR Program.

We also acknowledge the ongoing support and guidance that continues to strengthen ProSaver's mission, national training standards, and commitment to learner success.

As ProSaver submits this program for WSIB approval, we look forward to their response with optimism and confidence. Approval will not only validate the collective work invested in this initiative but will also enable ProSaver to expand its impact within the community.

In alignment with our values of accessibility and public service:

- **10% of program income will be allocated annually to provide free courses for individuals referred through Ontario Works**, ensuring that financial barriers do not prevent anyone from accessing essential lifesaving training.
- **10% of program income will be dedicated annually to support autism research**, advancing knowledge, awareness, and evidence-based practices within the community.

To everyone who played a role—large or small—thank you. Your contributions will help save lives, strengthen communities, and ensure that high-quality first aid education remains accessible to all.