Lecture 1: *Introduction*

Objectives

By the end of this lecture, you should be able to:

- Define First Aid.
- Mention principles of First Aid.
- Identify major First Aid techniques.
- Discuss steps of First Aid.
- State priorities of First Aid.

Introduction

- First Aid training provides skills to minimize the effects of accidents or illness.
- The First Aider is often the only person on the scene, so they must remain calm and make the right decisions under stress.

Definitions & Purpose of First Aid

- **First Aid**: Emergency care/treatment before advanced medical help arrives.
- **Purpose**:
    - Preserve life.
    - Prevent the condition from worsening.
    - Promote recovery.
    - Provide reassurance and reduce pain.

Who is a First Aider?

- A trained person (e.g., nurse, mother, teacher, social worker).
- Responsibilities:
    - Protect unconscious victims.
    - Prevent further harm.
    - Sustain life.
    - Offer comfort and reassurance.

Types of Accidents Requiring First Aid

- Slips & falls.
- Being struck by an object.
- Bicycle accidents.
- Burns (chemical/thermal).
- Motor vehicle accidents.

Six Major First Aid Situations

1. Bleeding
2. Burns
3. Head, neck, or spinal cord injuries
4. Poisoning
5. Choking
6. Loss of consciousness

First Aid Kit

1. Medical Supplies:

- Bandages, gauze, adhesive tape, cotton, scissors, sling, thermometer, ice bag, gloves.

2. Treatment Essentials:

- Alcohol, antiseptic, antibiotic ointments, antihistamines, painkillers (Ibuprofen, Acetaminophen), eye-wash solution.

General Principles of First Aid

1. Keep the victim away from danger.
2. Call emergency services (123) or get help.
3. Provide aid quickly but carefully.
4. Loosen tight clothing.
5. Keep the victim calm and warm.
6. Minimize their exposure to the injury.
7. Gather information from them or bystanders.
8. Perform First Aid efficiently.

Philosophy of First Aid

- Focus on maintaining **Airway, Breathing, Circulation (ABC's)**.
- Quick and effective interventions increase survival chances.

Exposure to Biological Hazards

- First Aiders may come into contact with blood or body fluids.
- **Prevention**: Wear gloves, masks, and protective gear.

Emergency Action Sequence

1. Ensure a **safe environment** (scene survey).
2. Check **responsiveness**.
3. Call **123**.
4. Check **Airway (A)**.
5. Check **Breathing (B)**.
6. Check **Circulation (C)**.
7. **Defibrillation** if needed.

Emergency Scene Survey

- **Safety**: Identify dangers and ensure the area is safe.
- **Scene Mechanism**: Understand what happened and identify potential injuries.
- **Situation**: Determine the number of victims and their condition.

Primary Survey (ABC's)

1. **Check for consciousness**.
2. **Check Airway**:
    - Open airway using **head-tilt/chin-lift** (unless neck injury is suspected).
3. **Check Breathing**:
    - Observe chest movement, listen for breath sounds, feel for air.
    - If no breathing, give **2 rescue breaths**.
4. **Check Circulation**:
    - Check **pulse** (carotid artery).

- If no pulse, perform **CPR**.
- Control **bleeding** if present.
- Assess **skin color, temperature, moisture**.

5. **Check for Disabilities (Spinal Injuries)**:
   - **AVPU Scale**:
     - **A**lert: Eyes open, responds to questions.
     - **V**oice: Responds to verbal stimuli.
     - **P**ain: Responds only to pain.
     - **U**nresponsive: No response to any stimuli.
   - Assess **movement, sensation, hand squeeze, Babinski reflex**.

Secondary Survey

- Conducted **after** stabilizing life-threatening conditions.
- **Head-to-toe physical examination** to identify other injuries or illnesses.
- Collect **victim's history** using **SAMPLE**:
  - **S**igns & symptoms.
  - **A**llergies.
  - **M**edications.
  - **P**ast medical history.
  - **L**ast oral intake.
  - **E**vents leading to the incident.

Key Reminders

- **Stay calm and act quickly.**
- **Always prioritize safety (yours and the victim's).**
- **Use ABC's approach (Airway, Breathing, Circulation).**
- **Call for professional medical help (123).**
- **Use protective gear to prevent infections.**

Lecture 2: *Cardiopulmonary Resuscitation (CPR) Study Notes*

Objectives

By the end of this lecture, the student will be able to:

- Define CPR technique.
- Identify components of CPR technique.

Introduction

- Continuous blood supply (oxygen + nutrients) is essential for cell function.
- The **cardiopulmonary system** and **brain** are responsible for this function.
- **Cardiopulmonary arrest** (sudden cessation of heart and lung function) leads to life-threatening conditions.
    - **Brain damage starts within 4-6 minutes** of arrest.
    - **Irreversible brain damage occurs within 8-10 minutes** if untreated.
    - If not managed properly with **CPR**, death will occur.

Definition of CPR

- **Cardiopulmonary Resuscitation (CPR):** A clinical intervention used to restart the heart after cardiac arrest and support life.
- **Components:**
    - **Chest compressions**
    - **Rescue breaths**
- **Defibrillator:** An electrical device that can restart the heart.

Goal of CPR

1. Maintain adequate **circulation**.
2. Maintain **airway patency** (keep airway open).
3. Initiate **breathing**.

Indications of CPR (Who Needs It?)

1. **Cardiac arrest** (No pulse).
2. **Respiratory arrest** (Not breathing).

3. **Cardio-respiratory arrest** (No pulse & No breathing).

Signs of Cardiopulmonary Arrest

Respiratory System:

- No breathing.
- Gasping respiration.
- Respiratory arrest.

Cardiac System:

- No pulse (check **carotid pulse in adults**).

Nervous System:

- Restlessness.
- Irritability.
- Agitation.
- **Pupil dilation**.
- **Decreased level of consciousness**.

Emergency Action Sequence

1. **Ensure a safe environment** (Survey the scene).
2. **Check level of responsiveness** (Conscious or unconscious?).
3. **Call emergency services (123)**.
4. **Check Airway** (Assessment + Intervention).
5. **Check Breathing & Pulse** simultaneously (Assessment + Intervention).
6. **Defibrillation** (Use defibrillator if available).

Important CPR Principle

- **In victim assessment, start with: ABC** (**Airway, Breathing, Circulation**).
- **In performing CPR, start with: CAB** (**Compression, Airway, Breathing**).

CPR: Chest Compressions

1. **Call for an ambulance**, then start **CPR immediately**.
2. **Give 30 chest compressions** first.

3. **Hand Placement:**
    - Place hands at the **center of the chest** (over the **sternum**).
    - **Interlock fingers**.
4. **Compression Technique:**
    - Push **30 times** at a rate of **100-120 compressions per minute**.
    - **Elbows must be locked** and shoulders positioned directly above the chest.
    - Push down to a depth of **5-6 cm**.
    - Fully **release** after each compression (Do not "lean" on the chest).

CPR: Rescue Breaths

- **Ratio: 2 breaths for every 30 compressions (2:30)**.
- **How to give rescue breaths:**
    1. **Tilt the victim's head back**, lift the chin, and pinch the nose.
    2. **Make a seal** over the victim's mouth.
    3. **Blow air into the mouth** for about **1 second** per breath.
    4. **Do not overinflate the lungs** (you are not blowing up a balloon!).
    5. **Continue the cycle** of **30 chest compressions and 2 breaths** until help arrives.
    6. **If there is another first aider, swap** every **2 minutes** to avoid fatigue.

Compression-Only CPR (Hands-Only CPR)

- The **Canadian Red Cross** recognizes that compression-only CPR is an acceptable alternative.
- **How to do it:**
    - Give **continuous chest compressions** at a rate of **100 per minute**.
    - No rescue breaths are given.
- Recommended for **those who are untrained, unable, or unwilling to perform full CPR**.

When to Stop CPR?

1. The victim **regains vital signs** (starts breathing).
2. A **defibrillator is available** and ready to use.

3. The **rescuer is too exhausted** to continue.
4. The **scene becomes unsafe**.

Most Important Notes

1. **A defibrillator is:** An **electrical device** used to restart the heart.
2. **In victim assessment, start with: ABC** (**Airway, Breathing, Circulation**).
3. **In CPR, start with: CAB** (**Compression, Airway, Breathing**).
4. **Indications of CPR (who needs it):** The victim **does not breathe** and has **no pulse**, or has **one of them missing**.
5. **Normal heart rate: 60-90 beats per minute**.
6. **Chest compressions:**
    - **30 compressions at a rate of 100-120 per minute**.
    - **Depth: 5-6 cm**.
7. **CPR ratio (Breath:Compression): 2:30**.
8. **Compression-only CPR:**
    - Give **100 compressions per minute without rescue breaths**.

Lecture 3: *Bleeding*

Definition of Bleeding

- The **escape of blood** from blood vessels.
- Can occur **externally** or **internally**.

Definition of Hemorrhage

- **Large amount of bleeding in a short time**.

Classification of Bleeding

1. According to Blood Vessels

- **Arterial Bleeding**: Bright red, **spurts** in time with pulse (most dangerous).
- **Venous Bleeding**: Darker red, **steady flow**.
- **Capillary Bleeding**: Bright red, **slow oozing** (least dangerous).

2. According to Site

- **Internal Bleeding**: Blood leaks inside the body (more dangerous).
- **External Bleeding**: Blood exits through natural openings (mouth, nose, anus) or a skin wound.

Forms of External Bleeding

- **Hematemesis**: Vomiting blood.
- **Melena**: Black, tarry stool (indicates blood in feces).
- **Epistaxis**: Nosebleed.

Signs & Symptoms of Hemorrhage

- **Pale face and lips**.
- **Cold, clammy skin**.
- **Fainting and dizziness**.
- **Rapid and weak (thready) pulse**.
- **Subnormal temperature**.
- **Restlessness & apprehension**.
- **Rapid, shallow breathing (air hunger)**.

Complications of Bleeding

1. **Shock**.
2. **Organ failure**.
3. **Death**.

First Aid for Bleeding

1. Apply **pressure on either side** of the object.
2. **Raise the affected area** above heart level.
3. Cover wound with **gauze** and apply **pressure**.
4. Use **3 P's Technique** to stop bleeding:
    - **P**ressure on wound.
    - **P**art elevated above heart level.
    - **P**ressure point (nearest blood supply).

Bleeding from Special Areas

1. Epistaxis (Nosebleed) First Aid

- **Sit victim down, lean forward** (to prevent blood from entering throat).
- Breathe through **mouth**, avoid **coughing, spitting, or sniffing**.
- Apply **cold, wet cloth or ice pack** over nose.
- Pinch nostrils for **at least 10 minutes**.
- If bleeding continues, apply pressure for another **10 minutes**.
- If caused by injury, apply **gentle** pressure only.
- If bleeding doesn't stop, insert gauze with **adrenaline** and seek medical help.

2. First Aid for Ear Bleeding

- Place **victim in dorsal position**, head **raised and tilted** to the injured side.
- Apply **dressing over the ear** (do not pack inside).
- Observe **respiration and pulse**.
- **Transfer to hospital immediately**.

3. First Aid for Scalp Bleeding

- Apply **clean dressing** around the wound (avoid pressing on fractures).
- Observe **pulse, respiration, and responsiveness** every **10 minutes**.

- If unconscious, ensure **airway is open** and start **ABC resuscitation** if needed.
- **Transfer to hospital immediately**.

Most Important Notes

Bleeding by Type

1. **According to speed**:
    - **Fastest → Slowest**: Arterial → Venous → Capillary.
2. **Most Dangerous Type**: **Arterial bleeding**.
3. **Least Dangerous Type**: **Capillary bleeding**.

Bleeding by Site

4. **Internal bleeding is more dangerous** than external bleeding.
5. **Forms of external bleeding**:
    - **Vomiting blood** → **Hematemesis**.
    - **Black stool (melena)** → **Indicates internal bleeding**.
    - **Nosebleed** → **Epistaxis**.

Hemorrhage Symptoms

6. **Pulse**: **Rapid & weak (thready pulse)**.
7. **Respiration**: **Rapid, shallow, air hunger**.

Complications of Bleeding

8. **Main risks**:
    - **Shock**.
    - **Organ failure**.
    - **Death**.

First Aid for Bleeding – "BLEEDING" Mnemonic

B – **Put gloves** (safety first).
L – **Look for bleeding site**.
E – **Apply pressure** on wound.
E – **Elevate wound** above heart level.
D – **Dress the wound** properly.

Stopping Bleeding - PS Technique

9. **The PS Technique includes**:
    - **Direct pressure on wound**.
    - **Elevate part above heart level**.

- **Pressure point** (nearest blood supply to wound).

Internal Bleeding

- **Skin remains unbroken** (True/False → **True**).
- **More serious than external bleeding** (True/False → **True**).
- **Most important sign**: **Contusion (bruise)**.
- **Monitor breathing, pulse, and responsiveness every 10 minutes**.

Epistaxis (Nosebleed) - Key First Aid Step

- **Tilt forward, not backward**.
- **Close nostrils for at least 10 minutes**.

Lecture 4: *Wounds*

Definition:

- A wound is a break in the skin's surface or an injury to the soft tissue.

Classification of Wounds

1. According to Healing Time:

- **Acute Wounds:** Heal uneventfully within the predicted time.
- **Chronic Wounds:** Take longer to heal and may have complications.

2. According to Level of Contamination:

- **Clean Wound:** Made under sterile conditions, with no organisms present, healing without complications.
- **Contaminated Wound:** Usually from accidental injury, containing pathogenic organisms and foreign bodies.
- **Infected Wound:** Pathogenic organisms present and multiplying, showing signs like pus, redness, and soreness.
- **Colonized Wound:** A chronic wound with pathogenic organisms that is difficult to heal (e.g., bedsore).

3. According to Wound Origin:

- **Internal Wounds:** Caused by issues within the body, such as chronic medical conditions (diabetes, deep vein thrombosis).
- **External Wounds:** Caused by trauma (penetrating or non-penetrating).

4. According to Wound Shape:

- **Closed Wounds:** No exposure of underlying tissue or organs (e.g., contusion).
- **Open Wounds:** The underlying tissue is exposed (e.g., penetrating wounds).

Types of Open Wounds:

1. **Abrasion:**
    - The top layer of skin is removed, with little or no blood loss.
    - Can be serious if foreign matter is embedded.
2. **Incision:**
    - A wound with regular edges, caused by a sharp instrument like a knife.
3. **Laceration:**
    - A wound with irregular edges, caused by sharp objects like glass or machines.
4. **Puncture Wound:**
    - Deep, narrow wounds caused by sharp objects like nails or needles.
5. **Gunshot Wound:**
    - Characterized by a small entry and larger exit wound, causing extensive internal damage.
6. **Amputation:**
    - The cutting or tearing off of a body part (finger, arm, leg, etc.).

Signs and Symptoms of Wounds:

Signs:

- Redness
- Swelling
- Bleeding
- Loss or impairment of function in the wounded area

Symptoms:

- Pain
- Pus drainage
- Heat (especially in infections)

Physiology of Wound Healing:

- **Inflammation Phase:** Redness, swelling, heat, pain.
- **Proliferation Phase:** Tissue regrowth, wound closure.
- **Maturation Phase:** Scar formation and strengthening of the new tissue.

Complications of Wounds:

1. **Infection:**
    - Symptoms: Pus drainage, foul odor, fever, swelling, throbbing pain.
2. **Scarring:**
    - Regenerated tissue forms scars, sometimes affecting function.
3. **Loss of Function:**
    - If major organs, blood vessels, or nerves are damaged, wounds can cause disability.
4. **Tetanus:**
    - Caused by **Clostridium tetani** bacteria.
    - Produces a toxin leading to painful muscle contractions.
    - Symptoms:
        - Muscle stiffness (lockjaw)
        - Difficulty swallowing
        - Tetanic seizures
        - Inability to walk
    - Preventable by vaccination.

First Aid Guidelines for Minor Open Wounds:

1. Use a barrier (gloves, sterile dressing).
2. Apply **direct pressure** for a few minutes to stop bleeding.
3. Wash the wound thoroughly with soap and water.
4. Dry the wound well.
5. Apply **antibiotic ointment** (if no allergies exist).
6. Cover with a **sterile dressing** or adhesive bandage.

First Aid Guidelines for Major Open Wounds:

1. **Wear gloves** (eye and face protection if blood splatter is expected).
2. **Control bleeding:**
    - Cover wound with a dressing and apply firm pressure.
    - Use a pressure bandage if bleeding continues.
    - Do **not** remove blood-soaked bandages; add more on top.
3. Observe for **signs of worsening condition** (fast or slow breathing, pale skin, restlessness).
4. **Care for shock:**
    - Keep the patient warm.
    - Monitor vital signs (weak carotid pulse, cold clammy skin, shallow breathing).
5. Immobilize the injured area if necessary:
    - **Upper limb:** Use a sling.
    - **Lower limb:** Tie to the uninjured leg.
6. **Transfer to a hospital** as soon as possible if needed.

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5 signs of wound infection,:

1. **Redness** – Increased blood flow to the area as a response to damage.
2. **Pain** – Worsens with pressure; cold compresses can help manage it.
3. **Swelling (Edema)** – Extra fluid trapped at the infection site causes swelling; elevating the area can help.
4. **Heat** – The infected site feels warm due to increased blood flow.
5. **Loss of function** – The wound can make simple activities difficult, such as picking up objects or walking.

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4 Phases of Wound Healing:

1. **Hemostasis (Day 1-3)** – The process of stopping bleeding.
2. **Inflammation (Day 3-20)** – The body's response to injury, forming a framework for blood vessel growth.
3. **Proliferation or Granulation (Week 1-6)** – New tissue forms, pulling the wound closed.
4. **Remodeling or Maturation (Week 6 to 2 Years)** – The final phase where the tissue strengthens and matures.