LESSON

09

HEMORRHAGE AND SHOCK

Duration • 02 Periods • (Lecture 02 Periods)

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. List four methods of controlling external haemorrhage.
2. List ten signs and symptoms of shock.
3. List the five steps for pre-hospital treatment of shock.
4. List the three steps for pre-hospital treatment for internal haemorrhage.

1

Review of the Organs

1.1 The Heart

The heart is a hollow muscular organ.

- The _____ side of the heart receives the deoxygenated blood coming from the body and pumps it to the lungs for reoxygenation.

- The _____ side of the heart receives the oxygenated blood coming from the lungs and from there it is pumped through the whole body.

_____

_____

1.2 Arteries

Arteries are blood vessels that transport the blood to the body. These are very high pressure blood vessels. They are of different diameters, ranging from very thick (aorta, femoral), to medium (radial) and small (arterioles).

Arterial bleeding is characterized by a _____ _____ color.

_____

_____

1 Review of the Organs (Cont.)

1.3 Capillaries

Each artery is divided into increasingly smaller transport vessels until they narrow down into capillaries, the tiny vessels closest to the skin. Through their thin walls, the exchange of _____ and _____ takes place. Other substances are also exchanged between the body's cells and the blood.

_____

_____

1.4 Veins

Blood vessels that carry blood back to the heart. Veins do not have as much pressure as the arteries. Venous bleeding is characterized by a _____ color.

_____

_____

2 Blood

2.1 Composition

The solid portion of the blood consists of

- _____
- _____
- _____

The liquid portion is called _____.The normal adult has approximately five to six litres of blood.

2.2 Functions

- Blood transports _____ and _____ to tissues. It also transports cells that combat _____ and eliminate _____.
- Blood also has the capacity to _____ (Solidify). This process usually takes 6–7 minutes.

_____

_____

3 Pulse

The pulse can be felt more easily in areas of the body where _____ are closer to the skin and near a solid structure (bone).

The most accessible pulse locations are:

- _____
- _____
- _____
- _____

4 Hemorrhage

Definition: The loss of blood from the body.
It can be external and or internal.

4.1 External Hemorrhage Types

With external hemorrhage, the wound and loss of blood are visible.

- **Arterial** _____
  _____
- **Venous** _____
  _____
- **Capillary** _____
  _____

4.2 Pre-hospital Treatment for External Hemorrhage

1) Apply direct pressure.
   _____
2) Elevate injured extremity (with direct pressure).
   _____
3) Apply hemostatic Dressing
   _____
4) Use a tourniquet.
   _____

4 Hemorrhage (Cont.)

4.3 Using a Tourniquet

Use a tourniquet **only** in a severe emergency when other means fail to stop the bleeding from an extremity. Apply the tourniquet as **distal** as possible.

> **DANGER:**
> Using a tourniquet can cause damage to the nerves and blood vessels. It can result in the loss of extremity.

_____

_____

5 Internal Hemorrhage

Internal hemorrhage can range from minor importance to a major life-threatening problem. The loss of blood cannot be seen in internal bleeding.

5.1 Signs and symptoms

- _____
- _____
- _____
- _____

5.2 Pre-hospital Treatment for Internal Hemorrhage

1) Maintain an open airway and provide high-flow oxygen per local protocol.

   _____

2) Keep the patient warm, but be careful not to overheat him/her.

   _____

3) Treat for shock.

   _____

Transport the patient as soon as possible.

Report the possibility of internal bleeding as soon as more highly trained EMS personnel arrive at the scene.

6 Perfusion

Definition: The circulation of blood throughout an organ.

An organ is perfusing when oxygenated blood is entering through the arteries and is exiting through the veins.

Perfusion maintains the cells in the organ by giving them oxygen and other nutrients and by removing waste products. If perfusion fails, it will result in the death of an organ.

7 Shock

Definition: Failure of the circulatory system to provide adequate oxygenated blood supply throughout the body (inadequate tissue perfusion).

7.1 Causes of Shock

- Inability of the heart to pump enough blood through the organs.
- Severe loss of blood; insufficient blood in the system.
- Excessive dilation of blood vessels. Blood volume will be insufficient to fill them and shock will develop.

Any of the above can cause oxygen insufficiencies in the body's organs. There are different types of shock but the end result is the same: inadequate perfusion to the organs.

7.2 Signs of Shock

Breathing: _____

_____

Pulse: _____

_____

Skin: _____

_____

Face: _____

_____

Eyes: _____

_____

7.3 Symptoms of Shock

- _____
- _____
- _____
- _____
- _____

There is nothing the first responder can do to reverse the late stages of shock, but it is possible to keep the patient from deteriorating until a higher level of help arrives.

It is of utmost importance that the patient be evaluated and treated to prevent the onset of shock.

7.4 Pre-hospital Treatment for Shock

1) Maintain open airway. If breathing is inadequate, administer oxygen.

2) Prevent further blood loss (by using direct pressure, elevation or pressure points).

3) Elevate the lower extremities 20-30 cm, only if there are no suspected spinal, neck, chest or abdominal injuries. If anyone these injuries is suspected, keep the patient supine (face up).

4) Keep the patient warm, but do not overheat.

5) Provide care for specific injuries.

Transport patient immediately.

POST-TEST | LESSON 9

Hemorrhage and Shock

1. List the four methods of controlling external hemorrhage:

   - _____
   - _____
   - _____

2. List the ten signs and symptoms of shock.

   - _____
   - _____
   - _____
   - _____
   - _____
   - _____
   - _____
   - _____
   - _____
   - _____

3. List the five steps for pre-hospital treatment of shock.

   1) _____
   2) _____
   3) _____
   4) _____
   5) _____

4. List the three steps for pre-hospital treatment for internal hemorrhage.

   1) _____
   2) _____
   3) _____

MFR LESSON 9 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course. Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration ☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?	☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable.
Please turn in this completed form to the instructor.

LESSON

10

SOFT-TISSUE INJURIES

Duration 09 Periods (Lecture-02 Periods and Practical-07 Periods)

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. List two steps to treat a closed wound.
2. List six steps to treat an open wound.
3. List the steps for pre-hospital treatment for eye, ear, nose and mouth injuries.
4. List the steps for pre-hospital treatment of abdominal and genital injuries.
5. Demonstrate the use of dressings and bandages to control bleeding when given a specific area of the body.
6. Demonstrate the pre-hospital treatment for the following:
   - Impaled object in the eye or cheek
   - Bleeding neck injuries

1 Definition

Soft tisue injuries, commonly referred to as wounds, are injuries to the skin, muscle, nerves, and blood vessels.

2 Closed Wounds

Closed wound:
Injury to the soft tissues beneath unbroken skin.

Closed wounds can involve superficial damage to the skin or can be severe with damage to internal organs. Small contusions generally do not need treatment, whereas more serious injuries can be fatal. Closed wounds are generally caused by impact with a _____ object.

- **How to recognise closed wounds:**
  - Swelling
  - Tenderness
  - Discoloration
  - Possible deformity

2 Closed Wounds (Cont.)

▸ **Pre-hospital treatment for closed wounds**

Use universal precautions and secure the scene.

1) Apply **"RICE"** method: rest, ice, compress, elevate.
2) Monitor the patient for any _____ that might indicate internal bleeding, which should be treated by a physician.
3) Do not give any oral intake to the patient.
4) Treat for shock.

Transport the patient as soon as possible.

3 Open Wounds

Open wound:
A soft tissue injury resulting in breaking of the skin.

▸ **Types of open wounds**

- Scratches and abrasions
- Lacerations - regular and irregular
- Penetration and puncture wounds
- Avulsions
- Amputations
- Crushing injury (may be open or closed)
- Gunshot wounds
- Impaled object
- _____
- _____
- _____
- _____
- _____

3 Open Wounds (Cont.)

- **Pre-hospital treatment for open wounds**
  Use universal precautions and secure the scene.

1) **Expose the wound.** Remove all clothing and expose soft tissue. Avoid removing clothing by pulling it over the patient's head. Best method is to remove clothing by _____.

_____

2) **Control bleeding.** Begin with direct pressure or indirect pressure and elevation. If wound continues to bleed use a pressure point. Use a tourniquet only as _____.

_____

3) **Prevent contamination.** Remove debris and contamination around the surface of the wound. Do not try to remove embedded particles.

_____

4) **Dress and bandage** _____.

_____

5) **Cover the patient** _____.

_____

6) **Treat for shock.**

_____

Transport the patient as soon as possible.

4

Dressings and Bandages

Dressing: Any material used to cover a wound that helps control bleeding and aids in the prevention of additional contamination.

Bandage: Any material used to hold a dressing in place.

Occlusive dressing: Any water-resistant material (plastic or waxed paper) applied to a wound to prevent the entrance of air and the loss of moisture from internal organs.

Bulky dressing: Multiple stacked dressings made to form a single dressing 2-3 cm thick, such as a thick sanitary towel or any similar material.

4.1 Applying Dressings and Bandages

When applying a bandage and dressing you should be able to:

- Control bleeding.
- Apply the dressings using aseptic technique.
- Cover the wounds completely.
- Ensure that the dressing and the bandage are firm, fixed and comfortable, but not so tight as to affect circulation.
- Ensure there are no loose ends that can get caught.
- Avoid covering the fingertips.

Pre-hospital treatment of wounds and soft tissue injuries is directed at controlling bleeding and preventing contamination.

4.2 Bandaging Unusual Wounds

▸ **Penetrating Injury**

1) Cover any open wound completely.
2) Examine the patient for possible exit wound.

▸ **Impaled Objects**

1) Do not remove unless impaled in the cheek or affecting the airway or CPR.
2) Control bleeding.
3) Stabilise the object with a bulky dressing and apply a bandage.

▸ **Avulsion (skin flap)**

1) Clean the wound surface
2) Return skin flap to original position
3) Control bleeding
4) Cover with bulky dressing and apply a bandage.

4 Dressings and Bandages (Cont.)

- **Amputations and unattached avulsions**
  1) Clean the wound
  2) Control bleeding
  3) Apply dressing and bandages
  4) Keep amputated part cold and moist, but not wet.

5 Special Situations

5.1 Injuries to the Scalp

Suspect spinal injury in any patient with a head injury. Do not apply direct pressure if you suspect a skull fracture.

5.2 Wounds to the Eyes (puncture wound or impaled object)

1) **Bandage the good eye** to prevent movement of injured eye.

2) In an **unconscious patient**, close the eyes before blindfolding the patient to prevent the eyes from drying, which may cause blindness.

3) **Treat an extruded eye the same way as you would treat an eye with an impaled object.** Do not replace the eye if it has been expelled. Cover it with a cup or cardboard cone before applying the bandage.

5.3 Injuries to the Ear

Blood, clear fluid, or blood-tinged fluid draining from the ear may indicate skull fracture or severe head trauma.

- Never probe the ear.
- Never pack the ear to stop bleeding; check for clear fluid (cerebrospinal fuild, or CSF) which may indicate a skull fracture from the ear canal.
- Place a loose clean dressing across the opening to absorb the fluids.
- Do not apply pressure.

5.4 Nosebleed

A nosebleed is an emergency that can be serious and should not be neglected. The loss of blood can be great and lead to shock. If the patient has a suspected skull fracture or spinal injury, do not try to _____. This topic will be discussed in more detail in the lesson on skull injuries.

_____

▸ **Pre-hospital treatment for nosebleeds**
Use universal precautions and secure the scene.

1) **Maintain open airway.**

_____

2) **Pinch nostrils together** or place a dressing between the upper lip and the gum and apply pressure.

_____

3) **Keep the patient seated and still.**

_____

4) **Do not pack the nose, check for clear fluid** (CSF) which may indicate a skull fracture.

_____

5) **Do not remove any object you may find inside the nose.**

_____

6) For avulsions, **apply a compressive dressing.**

_____

5.5 Injuries to the Neck

- Visible lacerations or other wounds can produce massive bleeding or air embolism.

- Difficulty speaking, loss of voice.

- Airway obstructions without foreign bodies in mouth, nose, or airway. Often caused by inflammatory process (subcutaneous emphysema).

- Tracheal deviation.

- Deformities or depressions.

- Immobilize the patient if you suspect spinal injury.

- **Pre-hospital treatment for injuries to the neck**
  Use universal precautions and secure the scene.

  1) If there is bleeding from a neck wound, **apply slight to moderate pressure** with an **occlusive dressing**. Tape down the edges of the dressing to form an airtight seal. Add a bulky dressing over the occlusive one. Never apply pressure to both sides of the neck at the same time. Never apply a pressure dressing completely around the neck.

     _____

  2) For patient without spinal injury, place patient on left side with a 15-degree incline (head lower), if possible.

     _____

  3) If an object is impaled in the neck, stabilise it in place with bulky dressings. Do not remove it.

     _____

  4) Treat for shock.

     _____

IMPORTANT:
With any head, face, scalp, eye, ear, nose or neck injury, the MFR should also suspect a possible spinal injury.

5.6 Injuries to the Abdomen

The abdomen contains solid and hollow organs. The rupture of _____ (stomach, large and small intestine) can cause the contents (acids, digestive enzymes, bacteria) to spill into the peritoneal cavity, causing an inflammatory reaction. Rupture of the _____ organs (liver, spleen, etc.) can cause severe hemorrhage.

A contusion may indicate injury to the abdomen or pelvis.

▸ Signs and symptoms of abdominal injury

- Pain or cramps in the abdominal area, local or diffuse

_____

- Guarding the abdomen or lying down in foetal position

_____

- Tenderness of the abdomen

_____

- Signs of shock

_____

- Rigid, tense or distended abdomen

_____

- Mild discomfort progressing to intolerable pain

_____

- Deep, penetrating pain in the pelvis or lower back

_____

- Pain radiating to a shoulder or both shoulders

_____

- Vomiting blood, bright red or like coffee grounds.

_____

- Blood in the stool, bright red or tarry black.

_____

- **Pre-hospital treatment for abdominal injuries**
  Use universal precautions and secure the scene.
  Be alert for patient vomiting.

  1) **Cover all open wounds.**

  2) **Do not replace exposed internal organs** – cover them with thick, moist sterile dressing. Then loosely cover moist dressing with occlusive dressing. Keep exposed area warm by placing a dressing or towel over the occlusive dressing.

  3) **Do not remove impaled objects** – stabilise them with bulky dressings.

  4) **Constantly monitor vital signs.**

  5) **Place patient supine** with legs in most comfortable position.

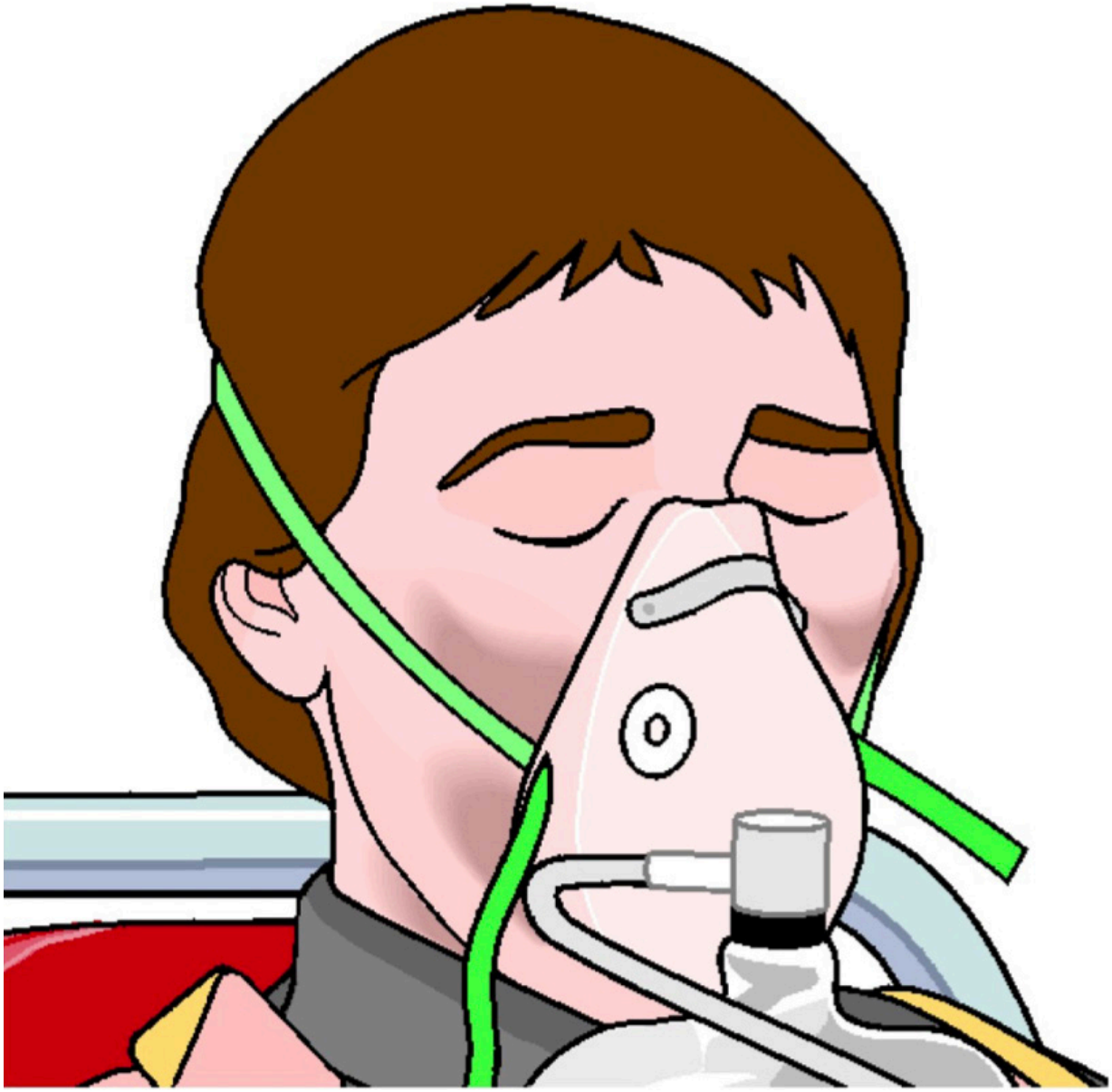
  6) **Treat for shock.**

5.7 Injuries to the Genitals

- **Pre-hospital treatment for wounds to genitalia**

  Wounds to the genitals should be treated the same as any other wound. However, special care and attention should be given to protect the patient's privacy.

(To be used in Station 2, Applying Tourniquet)



Stations 1, 2, 3 and 4

Student Name: _____ **Dates:** _____

Instructions: Check the box showing on which attempt the participant was able to perform the step successfully. UTP indicates unable to perform successfully within four attempts.

Performance Guidelines		Successful on Attempts				UTP
		1	2	3	4	
Station 1	Use of PPE.					
	Control bleeding and bandage bleeding neck wound.					
Station 2	Use of PPE.					
	Control bleeding.					
	Apply compressive bandage.					
	Apply tourniquet.					
Station 3	Use of PPE.					
	Bandage extruded eyeball. Cover with moist during & protective cup. Bandage both eyes.					
	Isolate and bandage impaled object in eye.					
Station 4	Use of PPE.					
	Stabilise and bandage impaled object.					

Comments _____

Overall Performance	
Station 1 ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:	**Station 2** ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:
Station 3 ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:	**Station 4** ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:

Please write applicable comments on reverse, and check box: ☐

POST-TEST | LESSON 10

Soft Tissue Injuries

1. List six steps used to treat an open wound.

   1) _____

   2) _____

   3) _____

   4) _____

   5) _____

   6) _____

2. List two steps used to treat a closed wound.

   1) _____

   2) _____

3. Describe the pre-hospital treatment for the following injuries.

   Mouth:

   - _____
   - _____
   - _____

   Nose:

   - _____
   - _____

POST-TEST | LESSON 10

Soft Tissue Injuries (Cont.)

Eyes:

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

Outer Ear:

- **Minor Laceration** _____

  _____

- **Severe Laceration** _____

  _____

- **Avulsion** _____

  _____

Middle Ear:

_____

_____

4. What is the pre-hospital treatment for <u>abdominal injuries</u>?

1) _____

2) _____

3) _____

5. What is the pre-hospital treatment for <u>genital injuries</u>?

_____

_____

MFR LESSON 10 EVALUATION

Course Location: _____ **Dates:** _____

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Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
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LESSON

11

MUSCULOSKELETAL INJURIES

Duration • 09 Periods • (Lecture-02 Periods and Practical-07 Periods)

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. Define an open fracture and closed fracture and list four signs and symptoms.
2. Define a dislocation, a sprain and a strain and list four signs and symptoms.
3. Give two reasons for immobilizing a fracture, a sprain or a strain on a patient.
4. Demonstrate the pre-hospital treatment of fractures and dislocations of the extremities, hips and shoulder.

1

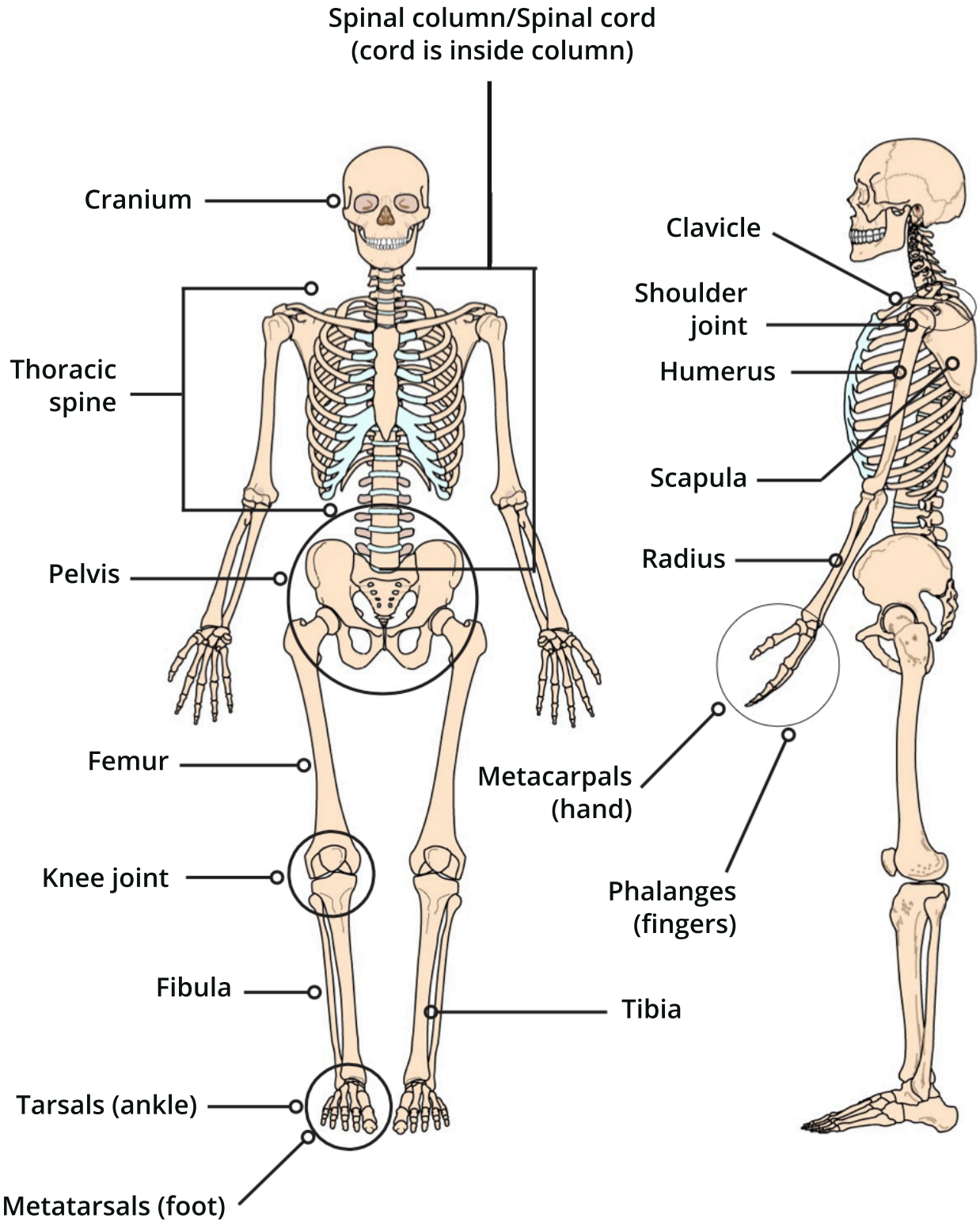
Skeletal System

The adult skeleton is composed of 206 bones. The human skeleton consists of two main divisions, the axial skeleton and the appendicular skeleton.

Functions of the skeletal system

- Provides a _____ for the body
- Protects _____
- Provides for body _____
- Produces _____ cells

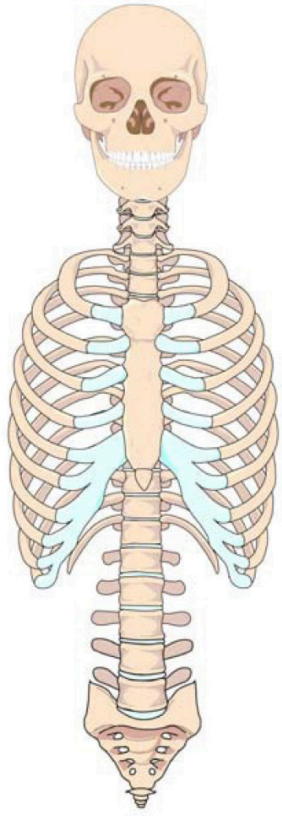
Skeletal System (Cont.)



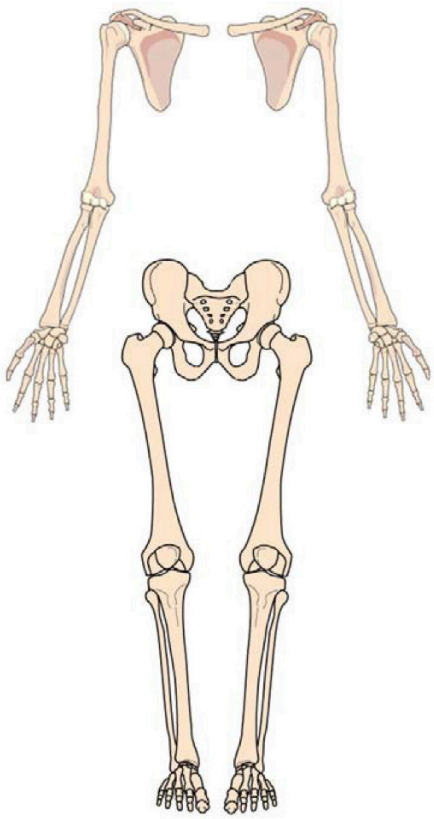
1

Skeletal System
(Cont.)

▾ *Axial Skeleton*



▾ *Appendicular Skeleton*



Axial Skeleton

The axial skeleton (at right) consists of 80 bones, including:

- Skull
- Thorax
- Vertebral (spinal) column

Appendicular Skeleton

The appendicular skeleton (below, right) consists of 126 bones which includes:

- Shoulder: clavicle and scapula
- Upper extremities: arms, hands, fingers
- Pelvis (hips)
- Lower extremities: legs, feet, toes

Joints (articulations)

Joints are bone ends that fit into each other. There are several types of joints:

- Immovable joints, such as in the skull
- Slightly movable joints, such as the spine
- Freely movable joints, such as the elbow or knee joints (hinge) or the hip joint (ball and socket)

Ligaments and Tendons

- Ligaments connect and hold bones together at the joints
- Tendons attach the skeletal muscles to the bone. These muscles control the movement of the joints.

2

Fractures, Dislocations and Sprains

2.1 Fractures

Definition: Any break in the continuity of a bone.

Fractures can be open or closed.

Closed Fracture: One in which the overlying skin is intact. Proper splinting helps prevent closed fracture from becoming open fracture.

Open Fracture: One in which the skin has been broken or torn either from the inside by the injured bone, or from the outside by the object that caused the penetrating wound with the associated bone injury. The bone may or may not protrude through the wound. Open fractures are serious because of risk of contamination or infection is greater.

Treat life-threatening injuries first. It is impossible to rule out a fracture through a physical exam of the patient. Many sprains and dislocations present signs and symptoms similar to a fracture.

2.2 Dislocation

Dislocation: Injury in which a bone is moved out of its normal position in a joint and remains that way.

A dislocation sometimes causes the tearing of ligaments and soft tissues if stretched far beyond the normal range of motion. The shoulder, elbow, fingers, hips, and ankles are the joints most frequently affected. Signs and symptoms of dislocation are similar to those of a fracture.

2.3 Sprains and Strains

Sprain: Injury in which ligaments are stretched or partially torn, commonly associated with joint injuries

Do not confuse a sprain with a strain, which involves muscle injury.

Strain: Injury in which a muscle, or a muscle and tendon are over-extended.

Dislocation, fracture and sprain may all be present in an injury.

2.4 Signs and Symptoms of a Musculoskeletal Injury

- Deformity or angulation: compare with opposite limb

- Pain and tenderness upon palpation or movement

- Crepitus (grating) – a sound or feeling of broken bone ends rubbing together

- Swelling

- Bruising or discoloration

- Exposed bone ends

- Joint locked in position – reduced motor ability or reduced ability to articulate a joint

- Numbness and paralysis – may occur distal to site of injury caused by bone pressing on a nerve

- Circulatory compromise distal to injury evidenced by alteration in skin colour, temperature, pulse or capillary refill

NEVER intentionally induce crepitus.
This may cause or aggravate soft tissue injury.

3 Splinting

Definition: Applying a device to stabilize any painful, swollen, or deformed body part

The primary objective of splinting is to prevent further movement of body parts. For any splint to be effective, it must immobilize adjacent joints and bone ends.

Reasons for splinting include:

- _____
- _____
- _____
- _____
- _____

3.1 Types of Splints

Effective splinting may require some ingenuity. Though you may carry many types of splinting devices, many situations will require you to improvise.

▸ **Five basic types of splints**

- **Rigid splint:** Requires limb to be in anatomical position. Ideal for long-bone injuries.

  _____

- **Conforming splint:** Can be moulded to different angles to surround the extremity

  _____

- **Traction splint:** Used specifically for femur fractures.

  _____

- **Sling and swathe:** Two triangular bandages used to hold an injured arm in place against the body.

  _____

- **Improvised splints:** a book, cardboard, pillow or blanket, etc.

  _____

3.2 General Rules for Splinting

Regardless of the method of splinting, general rules apply to all types of immobilization, as follows:

- Always communicate your plans with your patient, if possible.

- Before immobilizing an injured extremity, expose and control bleeding.

- Always cut away clothing around the injury site before immobilizing the joint. Remove all jewelry from the site and below it.

- Assess pulse, motor function and sensation (P.M.S.)

- If limb is severely deformed or distal circulation is compromised (cyanosis distal to fracture site or no distal pulse), align the bone with gentle traction (pulling). If pain or crepitus worsens, discontinue.

- Do not attempt to push protruding bone ends back into place. However, when realigning, they may slip back into place. Make a note if this occurs.

- For patient comfort and proper immobilization, pad voids between the body and the splint, since many rigid splints do not conform to body curves.

- Pad a splint before applying it.

- If a joint is injured, immobilize it and the bones above and below.

AVOID TUNNEL VISION

- **Do not over-splint** the patient. In multi-system trauma patients, do not be distracted from life-threatening injuries by the gross appearance of non-critical injuries.

- Securing the patient to a long spine board supports and splints every bone and joint in one step without wasting time.

- **Be flexible.** While splinting be flexible. Keep in mind patient's comfort and principles of splinting.

4

Pre-hospital Treatment for Suspected Fracture, Dislocation or Sprain

Examining involves use of your senses and skills of inspection (looking), palpation (feeling) and auscultation (listening). Use universal precautions and secure the scene.

1) **Perform initial assessment**

- Identify and treat _____ problems.
- Do not be distracted by _____.
- Remember cervical collar and oxygen, if applicable.

_____

_____

2) **Perform physical exam.**
You can use the mnemonic (BPDOC) to guide your exam as you look for signs and symptoms of injuries.

- Check for visible ---------- . Check all joints and bones through entire length of body.
- Assess for Pain or ask the patient if he/she feeling ----------
- Check for visible ----------.Check all joints and bones through entire length of body.
- Check for ----------, common with extremity injuries.
- Check for -------- sound of bones

For extremity injuries, always assess for distal pulse, motor function and sensation of (P.M.S.), **before and after splinting.**

- **Pulse:** Radial in upper extremity injuries, dorsalis pedis (top of foot) or posterior tibial pulse (back of ankles, medially) for lower extremities.

_____

- **Motor function:** check patient's ability to move, such as wiggling toes or fingers.

_____

- **Sensation:** Gently squeeze or pinch one extremity then the other, asking if patient can feel your touch.

_____

4

Pre-hospital Treatment for Suspected Fracture, Dislocation or Sprain (Cont.)

3) **Stabilise the injury.** After completing a physical exam, secure the injury site providing manual stabilization. Do not release manual stabilization of an injured extremity until it is properly and completely immobilized.

4) **Expose the injury.** Cut away clothing and remove jewelry before swelling occurs.

5) **Treat open wounds and control bleeding.** Cover with a clean or sterile dressing, avoid direct pressure over broken bone ends. Use pressure points as needed if bone ends protrude from injury, use caution not to allow bone ends to re-enter wound.

6) **Prepare your splinting materials.**

7) Carefully splint individual fractures.
Caution: Be careful not to restrict circulation.

8) Reassess _____, _____ and _____.

9) Apply _____ or _____ to injury site to reduce pain and swelling.

10) Treat for shock.

5

Pre-hospital Treatment for Specific Injuries and Application of Splints

5.1 Splinting the Upper Extremities

IMPORTANT: Always assess circulation, sensation and motor function before and after splinting.

- **Shoulder and Clavicle**

Signs and symptoms: Shoulder appears to be "dropped," deformity (asymmetry), pain.

Treatment: Apply a sling and swath. Provide any padding necessary to fill void between body and arm.

- **Humerus (Upper arm) and shoulder**

Signs and symptoms: Pain, swelling, deformity

Treatment: Apply a rigid splint to outside of arm, pad voids, then apply sling and swath. Alternate method could be using splints on both sides of the arm.

- **Elbow**

Important: Splint in position found - do not attempt to straighten.

Signs and symptoms: Pain, swelling, deformity

Treatment: If arm is bent at elbow, splint with sling and swath alternate is pillow or blanket. If elbow is straight, splint entire arm, armpit to fingertips, both sides.

5

Pre-hospital Treatment for Specific Injuries and Application of Splints (Cont.)

▸ Forearm and Wrist

Signs and symptoms: Pain, swelling, deformity

Treatment: Splint area with arm board, then sling and swath. (Pneumatic splints are an option.)

▸ Hands and Fingers

Important: Pulse can be checked by capillary refill.

Signs and symptoms: Pain, swelling, deformity

Treatment: If one finger is fractured, tape it to an adjacent finger or use tongue depressor to splint. If more than one finger is fractured, splint the entire hand in the position of function. Place a roll of bandage in palm of hand, or other object, then wrap entire hand and place on arm board.

5

Pre-hospital Treatment for Specific Injuries and Application of Splints (Cont.)

5.2 Splinting the Lower Extremities

▸ Pelvic Injuries

- Pelvic injuries can be life-threatening due to _____.
- Suspect shock.
- Any force strong enough to injure the pelvis can also injure the _____.

Signs and symptoms

- Pain, especially when pressure is applied to iliac crests or pelvic bones
- Inability to lift legs while lying on back

_____

_____

Pre-hospital treatment for pelvic injury

1) Minimize patient movement.

_____

2) Do not log roll or lift with pelvis unsupported.

_____

3) Place a folded blanket between patient's legs from groin to feet and bind together with cravats (2 upper leg, 2 lower leg).

_____

4) Place the patient on long backboard.

_____

5) Treat for shock.

_____

5

Pre-hospital Treatment for Specific Injuries and Application of Splints (Cont.)

▸ Hip Injuries

With this type of injury, it is difficult to differentiate an upper femur fracture from a hip or pelvic fracture or dislocation. Assess for life threatening injuries as with pelvic injuries.

_____

_____

Signs and symptoms of hip injury

- Pain
- Swelling
- Discoloration
- Inability to move leg(s)
- Possible foot rotation (outward or inward)

Pre-hospital treatment for hip injury

1) Bind legs together with a folded blanket between patient's legs.

   _____

2) Support the hip with pillows.

   _____

3) Stabilise patient on long backboard, or use long splints along outer thigh, from foot to armpit with padding and along the inner thigh, from groin to foot.

   _____

4) Secure with cravats.

   _____

5 Pre-hospital Treatment for Specific Injuries and Application of Splints (Cont.)

▸ Femoral Injuries

A femoral fracture can produce massive internal bleeding. Treat life-threatening conditions first.

Signs and symptoms of femoral fracture

- Pain (often intense)
- Deformity
- Rigidity
- Shortened limb

Pre-hospital Treatment

If you find the leg in a straight position, use two padded splints — one along the inner thigh from groin to the foot and the other along the outer thigh from the armpit to the foot. Secure with cravats.

▸ Knee Injuries

Signs and symptoms: Pain, swelling, deformity

Bent position: Immobilize in the position found. The bones above and below it should be splinted with short padded boards.

Straight position: Use two padded long splints, the first on the inner thigh from groin to beyond foot. Place the second on the outer thigh, from hip to beyond foot. Secure with cravats.

5

Pre-hospital Treatment for Specific Injuries and Application of Splints (Cont.)

▸ Tibia or Fibula Injury (Leg Injury)

Signs and symptoms: Pain, swelling, deformity

Pre-Hospital Treatment: Use two padded long splints – groin to foot and thigh to foot. Secure with cravats. Alternative method for a closed injury to the tibia or fibula is to use a circumferential splint or pneumatic splint.

▸ Ankle and Foot Injuries

Signs and symptoms: Pain, swelling, deformity.

Pre-Hospital Treatment: Stabilize, remove shoes and socks if possible (expose injury). Circumferential or formable splint such as a pillow secured with cravats is recommended.

Alternative: Padded boards to mid-thigh

Stations 1 and 2 –or– 3 and 4

Student Name: _____ **Dates:** _____

Instructions: Check the box showing on which attempt the participant was able to perform the step successfully. UTP indicates unable to perform successfully within four attempts.

Performance Guidelines		Successful on Attempts				UTP
		1	2	3	4	
Station 1 or Station 3	Use of PPE.					
	Splint a fracture or a dislocation of the shoulder					
	Splint fracture of the upper arm.					
	Splint dislocation of a bent elbow.					
	Splint fracture of the forearm.					
	Splint fracture of the wrist using rigid splint or pillow.					
Station 2 or Station 4	Use PPE.					
	Splint hip injury using two rigid splints.					
	Splint fracture of the thigh.					
	Splint fracture or dislocation of a bent knee.					
	Splint fracture of the lower leg.					
	Splint ankle injury using rigid splints or pillow.					

Overall Performance	
Station 1 ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:	**Station 2** ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:
Station 3 ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:	**Station 4** ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:

Please write applicable comments on reverse, and check box: ☐

Comments _____

_____

_____

_____

POST-TEST | LESSON 11

Musculoskeletal Injuries

1. **Describe an open and closed fracture, a sprain and a strain and list their signs and symptoms.**

Closed fracture _____

_____

Open fracture _____

_____

Signs and symptoms

- _____
- _____
- _____
- _____

Sprain

- _____

Signs and symptoms

_____

Strain

- _____

Signs and symptoms

- _____

POST-TEST | LESSON 11

Musculoskeletal Injuries (Cont.)

2. **Give two reasons for immobilizing a fracture, a sprain or a strain on a patient.**

- _____
- _____
- _____
- _____

3. **Describe the pre-hospital treatment of fractures and sprains of the extremities, hips and pelvis.**

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____
8) _____
9) _____
10) _____
11) _____

MFR LESSON 11 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course. Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration ☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?	☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable. Please turn in this completed form to the instructor.

LESSON

12

INJURIES TO THE SKULL, SPINAL COLUMN AND CHEST

Duration • 08 Periods • (Lecture-02 Periods and Practical-06 Periods)

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. List five signs and symptoms of a skull fracture.
2. List six signs and symptoms of a spinal injury.
3. List five signs and symptoms of chest injuries.
4. Demonstrate the procedures for the evaluation and pre-hospital treatment of injuries to the skull and spine.
5. Demonstrate the procedures for the evaluation and pre-hospital treatment of rib fractures, flail chest and penetrating chest injuries.

1

Review of the Axial Skeleton

1.1 Bones of the Head

The **skull** (cranium) has a number of broad, flat bones that form a hollow shell. The top (including the forehead), back and sides of the skull make up the cranium.
It houses and protects the brain.

- **Cerebrospinal fluid (CSF)** is a water-like cushion that protects the _____ and _____ from trauma.

_____

- The cranial vault is quite strong in adults and provides effective protection. However, even without a skull fracture, the brain can be damaged by trauma.

_____

1.2 Bones of the Face

- There are several small bones in the face. They give shape to the face and permit the jaw to move. These small bones are fused together except for the mandible (temporo mandibular joint, or TMJ) which allows the jaw to move.

_____

_____

1.3 Spinal Column

The spinal column houses and protects the spinal cord. The spinal column is the central supportive bony structure of the body. It consists of 33 bones known as _____. The spine is divided into five sections:

1) **Cervical:** _____
2) **Thoracic:** _____
3) **Lumbar:** _____
4) **Sacrum:** _____
5) **Coccyx:** _____

1.4 Chest

- **Bony structures:** The chest or rib cage includes the _____, the thoracic _____ and the _____. The ribs are attached at the back to the vertebrae. All but the bottom _____ ribs are not attached to the sternum.

  _____

  _____

- **Organs:** The thoracic cavity contains the _____ _____ , the _____ and the _____ blood vessels. Damage to the rib cage can cause injury to the vital organs.

  _____

  _____

2

Specific Injuries

2.1 Skull Fractures

The primary function of the skull is to provide protection for the brain. The skull is not easily fractured. A skull fracture may be suspected with any significant trauma to the head.

A skull fracture may occur with an open or closed wound. With a skull fracture, the MFR should suspect the possibility of a brain injury. With any head injury, there is also concern for possible spine injury.

DANGER!

- Do not try to remove an object impaled in the skull – stabilise it with bulky dressings.
- Do not try to stop the flow of cerebrospinal fluid if the fluid is leaking from the ears or a head wound. Cover the opening loosely with sterile gauze dressing.

Signs and symptoms of skull fracture

- Altered mental status, ranging from confusion to unresponsiveness
- Pain or inflammation at the injury site
- Deep laceration or hematoma in the scalp or forehead
- Softness or depression of the skull

Signs and symptoms of skull fracture (Cont.)

- Facial bruising

- Bruising behind the ears, or "Battle's Sign"

- Bruising around the eyes, or "racoon eyes"

- One or both eyes appear sunken

- Unequal pupil size

- Headache, disabling in severity or appearing suddenly

- Blood or cerebrospinal fluid leaking from the ears or nose

- Deterioration of vital signs

- Nausea and vomiting

- Abnormal posturing

- Seizure

2.2 Pre-Hospital Treatment

Use universal precautions and secure the scene.

1) **Perform initial assessment.**
Treat life-threatening conditions. If brain injury is suspected, hyperventilate the patient at 25 rpm.

2) **Control bleeding.** Do not try to stop the draining of blood or cerebrospinal fluid from the nose and ears.

3) Suspect cervical injury or another type of injury to the spinal column. **Manually immobilise** the head and neck in neutral in-line position. Apply cervical immobilisation device.

4) **Administer oxygen** if needed.

5) **Cover and bandage** open wounds.

6) **Position the patient properly** and do not allow the patient to move or change positions. If the patient is not hypotensive, consider elevating head 30 degrees. Caution: Be alert for possible patient vomiting.

7) **Assess level of consciousness.** Monitor vital signs.

2.3 Brain Injuries

- **Open/penetrating:** An open brain injury is accompanied by a break in the skull, caused by a fracture or an impaled object, for example. This usually implies exposure of the cranial cavity.

  _____

- **Closed:** A closed brain injury does not involve a break in the skull although the skin may be broken; even so, the brain can be seriously injured.

  _____

Signs and symptoms of brain injuries

- Vomiting _____
- Sickness _____
- Weakness _____
- Vision problems _____
- Headache _____
- Unconsciousness or decreased level of consciousness _____
- Posture change _____
- Altered breathing _____

Pre-hospital treatment for brain injuries is

The same as _____

_____

2.4 Facial Fractures

The main danger of facial fractures is _____

_____.

Signs and symptoms of facial fracture

- Blood in the airway _____
- Facial deformities _____
- Colour change below the eyes _____
- Inflammation of the jaw or limited motion _____

  _____
- Teeth that do not meet normally _____
- Pain or numbness _____
- Loose or broken teeth _____
- Swelling _____
- Any indication of a severe blow to the face (contusions or bruising) _____

Pre-hospital treatment for facial fracture

This procedure is the same as for soft tissue injuries. Use universal precautions and secure the scene.

1) Ensure open airway _____
2) Control bleeding _____
3) Bandage open wounds _____
4) Monitor vital signs _____
5) Treat for shock _____

2.5 Spinal Injuries

Signs and symptoms

- Numbness, tingling sensation in the arms or legs

- Paralysis of the arms or legs

- Pain during movement of the arms and legs

- Sensitivity or pain along the later part of the neck or the back

- Deformity of the head or neck

- Head injury or hematomas in the shoulders, back or the patient's sides

- Loss of bowel or bladder control

- Difficulty breathing with little or no chest movement

- The patient may be found supine with arms extended above the head (also known as posturing), which may indicate damage in the cervical region

- Priapism (persistent erection of the penis)

Determining possible spinal injury

▸ Conscious patient

Ask: _____

Observe: _____

Feel: _____

Signs of spinal injury may not be apparent. However, that does not rule out spinal injury.

▸ Unconscious patient

Observe: _____

Feel: _____

Ask others: _____

Complications of spinal injury

- Respiratory arrest, caused by paralysis of the thoracic muscles. Breathing can be accomplished only by the diaphragm, and paralysis of the thoracic muscles can severely reduce or compromise breathing.

  _____

- Neurological injury can affect the diameter of blood vessels, producing shock (neurogenic shock).

  _____

- General paralysis

  _____

Pre-hospital treatment for spinal injury

Use universal precautions and secure the scene.

1) Determine the mechanism of injury.

2) Provide **manual in-line neutral stabilization** of the head and neck upon first contact with the patient.

3) **Conduct initial assessment.** Consider any unconscious patient to be a trauma victim with possible neck or spinal injury until proven otherwise.

4) **Administer oxygen** per local protocol.

5) **Perform physical exam** and provide treatment.

6) **Maintain manual stabilisation** until patient is completely immobilised.

7) **Continually monitor vital signs** during patient transport.

2.6 Chest Injuries

Methods of Injury

- Blunt trauma _____
- Compression injury _____
- Penetrating injury _____

Signs and symptoms of chest injury

- Tenderness/pain at the injury site
- Chest deformity, coughing blood
- Shallow breathing with possible crackling sensation near site
- Increased pain during breathing
- Patient's posture toward the side of the fracture or injury
- Extensive, visible bruising to the chest
- Grating or crepitus upon palpation
- Subcutaneous emphysema
- Distended neck veins, bloodshot eyes, cyanotic tongue and lips, swollen upper torso

2 Specific Injuries (Cont.)

▸ Rib Fractures

Pre-hospital treatment for rib fractures

Use universal precautions, secure scene and alert EMS. **Your first priority is to ensure patient can breathe adequately.**

1) Apply a sling and swathe to hold the patient's arm against the injured side of the chest. Give the patient a pillow or blanket to hold against the ribs for support.

2) If patient is alert, allow him/her assume a comfortable position.

▸ Flail Chest

Pre-hospital treatment for flail chest

Flail chest is a closed chest injury causing the chest wall to become unstable, due to fractures of the sternum, cartilage connecting the ribs to the sternum or fractured ribs (the chest between the fractures becomes unstable).

Use universal precautions, secure the scene and alert EMS.

1) Locate the flailed section of the chest by carefully feeling the injured site.

2) Stabilize flail chest by applying a _____ or _____ dressing. You can also use a small object as a weight (less than 2 kg.)

3) Use adhesive tape to secure the bulky dressing. If no tape is available, use your hand to secure the injured site.

2

Specific Injuries (Cont.)

▸ Penetrating Wounds

- Penetrating chest injuries are open chest wounds in which the chest wall is torn, typically by a foreign object.

_____

_____

- Chest injuries: A penetrating chest wound can prevent a patient from breathing adequately. These wounds are called _____ because they produce a sucking sound every time the patient breathes. In this case, apply an _____ dressing. This special type of dressing is used to form an _____.

_____

_____

▸ Impaled Objects

As recommended in a previous lesson, an impaled object should always be immobilized in place, unless it is located in the patient's cheek, or if it interferes with airway management or CPR. It should be stabilized with bulky dressings and adhesive tape to secure the dressing in place.

_____

_____

_____

▸ Injuries to the Heart and Lungs

- A collapsed lung may be caused by _____ _____ due to injury or by _____ in the chest cavity (haemothorax).

_____

_____

- The blood in the cavity of the pericardium (the serous membrane that encloses the heart) can cause the heart to collapse.

_____

_____

Stations 1, 2, 3 and 4

Student Name: _____ **Dates:** _____

Instructions: Check the box showing on which attempt the participant was able to perform the step successfully. UTP indicates unable to perform successfully within four attempts.

Performance Guidelines		Successful on Attempts				UTP
		1	2	3	4	
Station 1	Use of PPE.					
	Treat penetrating and sucking chest wound					
	Treat impaled object to the chest					
Station 2	Use PPE					
	Treat a rib fracture					
	Treat flail chest					
Station 3	Use PPE					
	Place cervical collar on a sitting patient					
	Place cervical collar on a supine patient					
Station 4	Use of PPE					
	Place patient on backboard from supine position					
	Place patient on backboard from prone position					
	Place patient on backboard from standing position					

Overall Performance	
Station 1 ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:	**Station 2** ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:
Station 3 ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:	**Station 4** ☐ Outstanding ☐ Successful ☐ Needs Imp. Instructor:

Comments _____

POST-TEST | LESSON 12

Injuries to the Skull, Spinal Column and Chest

1. List five signs and symptoms of a skull fracture.

- _____
- _____
- _____
- _____
- _____

2. List six signs and symptoms of injury to the spine.

- _____
- _____
- _____
- _____
- _____
- _____

3. List five signs and symptoms of chest injuries.

- _____
- _____
- _____
- _____
- _____

MFR LESSON 12 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course. Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration ☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?	☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable. Please turn in this completed form to the instructor.

LESSON

13

BURNS AND ENVIRONMENTAL EMERGENCIES

Duration • 03 Periods • (Lecture-03 Periods)

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. Match the signs and symptoms for each of the three types of burns according to their depth.
2. Apply the "Rule of Nines" to determine the Total Body Surface Area (TBSA) burnt on a patient when given a specific part of the body.
3. List three steps for pre-hospital treatment of chemical burns.
4. List three steps for pre-hospital treatment of electrical burns.
5. List three signs and symptoms of heat cramps, heat exhaustion and heat stroke and describe pre-hospital treatment for each.
6. List four signs and symptoms of lightening injuries and describe pre-hospital treatment
7. List three signs and symptoms of both mild and severe hypothermia and list six steps for pre-hospital treatment.
8. List three signs and symptoms of frostbite and three steps for pre-hospital treatment.

1 Burns

Definition: Injuries caused by exposure to excessive heat from thermal, chemical, electrical or radiating sources.

1.1 Causes

Thermal: heat (fire, vapour and hot objects), and very cold (freezing or frozen objects)

Chemical: includes several caustics such as acids and alkalis

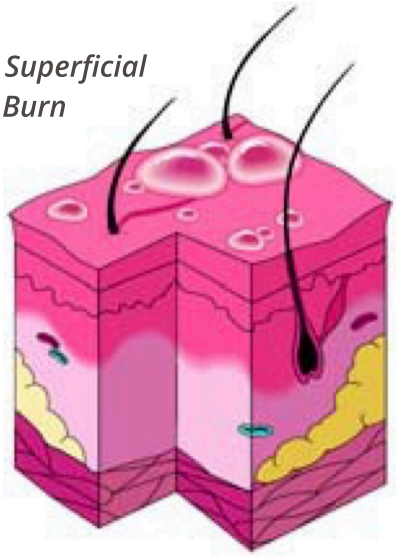
Electrical: electricity, such as house current or lighting

Radiant: ultraviolet rays (including sunlight) and radioactive agents.

1.2 Classification, Signs and Symptoms of Burns

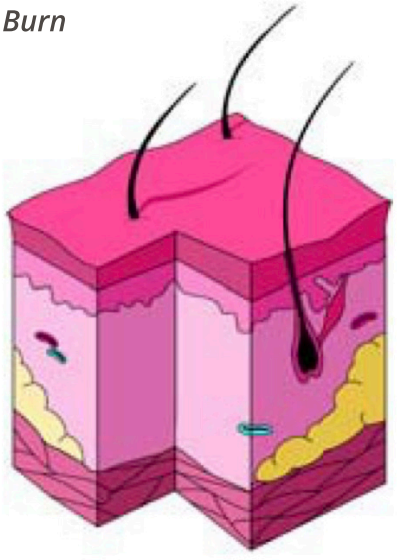
▸ Classification by depth

▾ *Superficial Burn*



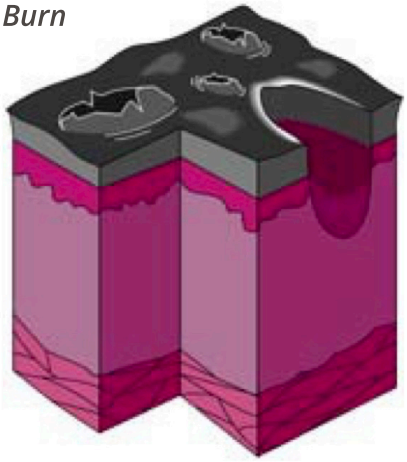
Superficial (first-degree) burns:
These involve only the top layer of the skin.

▾ *Partial Thickness Burn*



Partial thickness (second-degree) burns:
The superficial layer of the skin is burned through and the second layer is damaged.

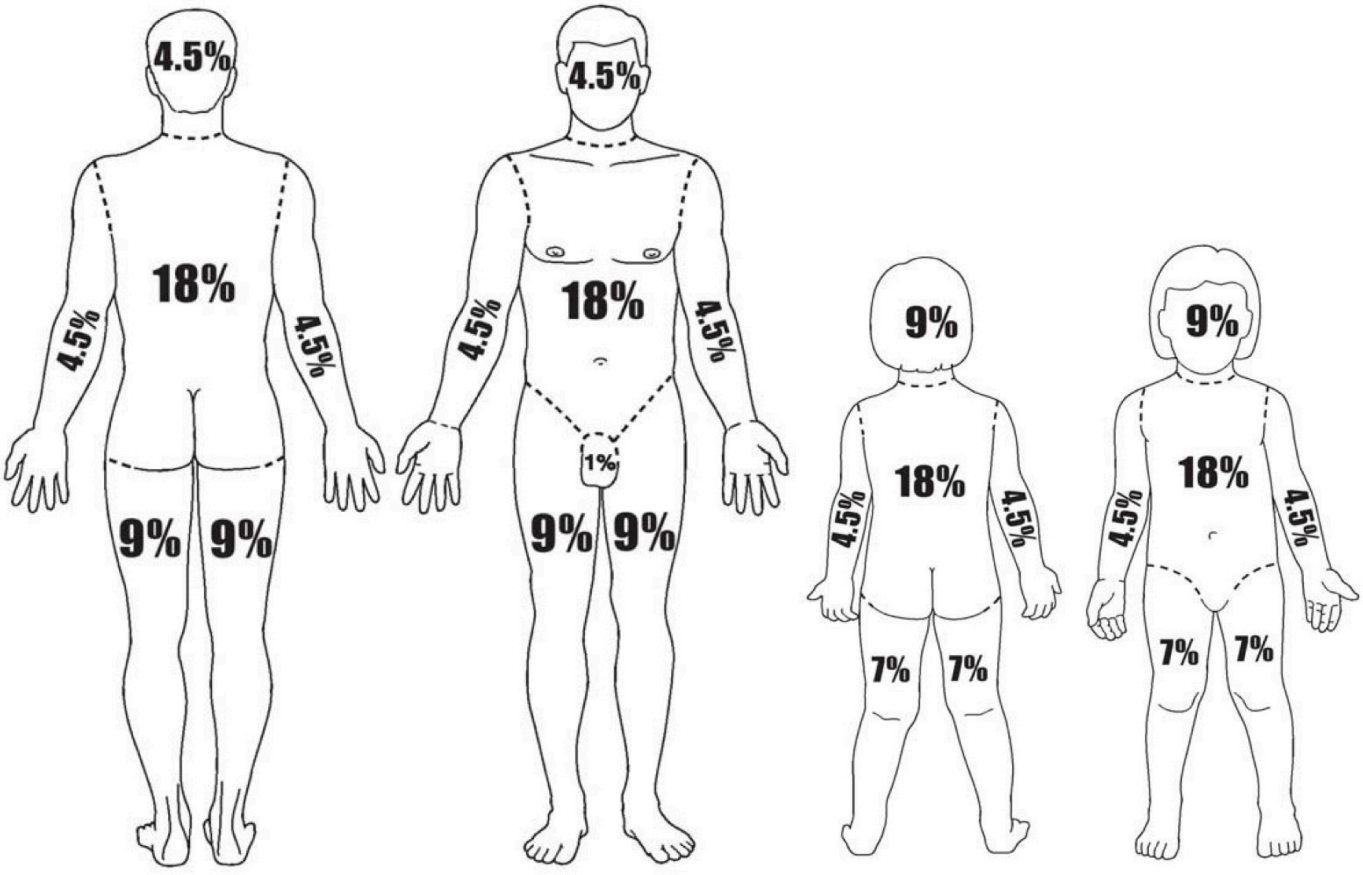
▾ *Full Thickness Burn*



Full thickness (third-degree) burns:
All layers of the skin are burnt, including the fatty layer.

THE RULE OF NINES FOR ADULTS AND CHILDREN

EXTENT OF BURNS		
	Adult	Child
Head	9%	18%
Upper extremities	9% each	9% each
Anterior Trunk	18%	18%
Posterior Trunk	18%	18%
Genital	1%	incl. in anterior trunk
Lower extremities	18% each	14% each
BSA	**100%**	**100%**



▲ *Adult* ▲ *Child*

1.3 Burn Severity

The two primary factors considered in rating burn severity are **body surface area (BSA)** and **Location**. Burn severity can be rated as follows:

- **Minor Burns**
  - Full-thickness burns of less than 2% BSA, excluding face, hands, feet, genitalia, or respiratory tract

    _____

  - Partial thickness burns of less than 15% BSA.

    _____

  - Superficial burns of 50% BSA or less.

    _____

- **Moderate Burns**
  - Full-thickness burns of 2% to 10% BSA, excluding face, hands, feet, genitalia, or respiratory tract

    _____

  - Partial thickness burns of 15% to 30% BSA.

    _____

  - Superficial burns over 50% BSA

    _____

Burns (Cont.)

▸ Critical Burns

- All burns complicated by injuries of the respiratory tract, other soft-tissue injuries, and injuries of the bones.

_____

- Partial- or full-thickness burns involving the face, hands, feet, genitalia, or respiratory tract.

_____

- Full-thickness burns of more than 10% BSA.

_____

- Partial-thickness burns of more than 30% BSA.

_____

- Burns complicated by musculoskeletal injuries.

_____

- Circumferential burns.

_____

Burns (Cont.)

▸ **Additional Considerations:**

- **Source of the burn.**
  - **Electrical** burns: _____
  - **Chemical** burns: _____
- **Body regions burned**
  - **Face**: _____
  - **Hands and feet**: _____
  - **Groin, genitalia, buttocks and inner thighs:** _____
  - **Burns around joints:** _____
- **Other complicating factors:**

_____

_____

_____

NOTE: Burns which by the above classification are moderate, should be considered critical in a patient less than 5 or more than 55 years of age.

1.4 Pre-hospital Treatment for Burns

Use universal precautions and secure the scene.

1) Stop the burning process. Run cold water over the scald burns. Flush away chemicals with water for _____ minutes or more.

2) Remove any smoldering clothing and jewelry. If you meet resistance or if you see pieces melted into the skin, cut around the area. Do not try to remove them.

3) Perform initial assessment.

4) Administer oxygen. Provide ventilation if needed.

5) Determine the severity of burns, using the rule of nines.

6) Cover the burns. Use dry sterile dressings or disposable sterile burn sheet. Do not use grease or fat, ointment, lotion, antiseptic, or ice on the burns. Do not break any blisters. If a burn involves the eye, be sure to cover both eyes after treating. Fingers with second- or third-degree burns require dressing each finger individually.

7) Keep the patient warm and treat for shock.

1.5 Pre-hospital Treatment for Chemical Burns

Use universal precautions, secure the scene, and alert EMS.

CAUTION:
If patient is contaminated, wash off the person from a distance to avoid exposing yourself to the chemicals.

1) Brush off dry chemicals, such as lime powder, before flushing with water.

_____

2) Rinse the area with water for at least 20 minutes or more. Remove and set aside clothes and jewelry while the patient is being washed off.

_____

3) Apply a sterile dressing to the affected area.

_____

4) Treat for shock.

_____

1.6 Pre-hospital Treatment for Chemical Burns to the Eyes

Rinse the eyes immediately with water for at least ____ minutes. Maintain a flow of water on the affected eye from a faucet (low pressure), bottle, glass or other source. Keep the patient's eyelid(s) open.

_____

_____

_____

_____

1.7 Pre-hospital Treatment for Electrical Burns

The more serious problems related to electrical burns are respiratory and/or cardiac arrest, damage to the nervous system and injury to internal organs. Use universal precautions, secure the scene and alert EMS.

Prolonged CPR should be performed on electrical injury victims as they can remain viable for a longer period than with other types of injuries.

Care for electrical burns the same as any other type of burn, also using the following specific guidelines for electrical burns.

1) Perform initial assessment.

2) Evaluate burns and look for at least two burn areas:

3) Apply a dry, sterile dressing to the burns.

4) Treat for shock.

1.8 Inhalation Injury

This type of injury occurs when a patient inhales heated air, smoke and/or toxic products. Symptoms for these injuries may appear mild initially, then become more severe.

Signs and symptoms of inhalation injury

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment for inhalation injury

1) Administer oxygen per local protocol.

   _____

2) Monitor patient's airway and breathing.

   _____

3) Be prepared to ventilate.

   _____

2.1 Heat Exposure

Exposure to excessive heat can produce serious health conditions. There are three common emergencies brought about by exposure to excessive heat:

- **Heat Cramps**
- **Heat Exhaustion**
- **Heat Stroke**

- **Heat Cramps**

  Heat cramps consist of pains and muscle spasms that occur when the body loses a large quantity of _____ through excessive sweating.

  _____

  Signs and symptoms of heat cramps

  - _____
  - _____
  - _____
  - _____

Pre-hospital treatment for heat cramps

1) Move the patient to a cool area.
2) Give the patient water. The muscle cramp should be alleviated after drinking water.

> **The patient needs the water more than the salt – do not delay giving water to look for salt. Commercial electrolytes or oral rehydration solution (ORS) can also be used.**

_____

_____

_____

_____

▸ Heat Exhaustion

Heat exhaustion can occur when a person in poor physical condition exerts himself or herself during physical activity in a very hot environment, causing blood flow to be affected.

_____

_____

Signs and symptoms of heat exhaustion

- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment for heat exhaustion

1) Move the patient to a cool place to rest.
2) Remove or loosen clothing as necessary to cool the patient without causing chills.
3) Place the patient in a supine position with legs elevated 20 to 30 cm.
4) Administer oxygen per local protocol.
5) Give water, but not to an unconscious patient.

▸ Heat Stroke

Heat stroke is a very serious life-threatening condition. The body becomes overheated and, in many cases, the patient stops sweating. If left untreated, brain cells will begin to die.

Signs and symptoms

- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment for heat stroke

Use universal precautions, secure the safety, and alert EMS.

1) Cool the patient quickly in any way possible. Move the patient away from the source of heat. Remove his or her garments and wrap the patient with wet sheets. Pour cold water on the sheets. This should normalize the patient's core temperature and help prevent brain cells from dying.

_____

2) Place cold bags or ice packs below each armpit, behind the knees and around the ankles, and one on each side of the neck.

_____

3) Look for a large container or bathtub and submerge the patient in cold water up to the neck. Use ice to cool the water.

_____

HEAT EMERGENCY COMPARISON CHART

	Heat Cramps	Heat Exhaustion	Heat Stroke
Muscle cramps	YES	NO	NO
Sickness	YES	YES	YES
Breathing	Varies	Quick & Superficial	Deep initially, later superficial
Pulse	Varies	Weak	Rapid & Strong
Skin	No change	Cool, clammy & pale	Dry, red & hot
Loss of consciousness	Rarely	Sometimes	Frequently

2.2 Lightening

Lightening is weather related disaster associated with thunderstorms.Lightening occurs due to the electrically charged regions in a cloud which is called intra cloud lightening(IC)or between cloud to cloud (CC Lightening), or between a cloud and the ground (CG lightening).

The charged region in the atmosphere temporarily equalizethemselves through this discharge referred to as a flash.A lightening flash becomes a strike if it involves an object on the ground.The flow of electric charges can affect any electrically conductive body. Living beings coming in contact with lightening, either directly or indirectly through electrical conductors can be affected , which may lead to severe burns or even death.

Lightning can produce a wide spectrum of peripheral and central neurologic injuries. The current can produce brain hemorrhages, edema, and small-vessel and neuronal injury. Hypoxic encephalopathy can result from cardiac arrest. Victims are most likely to die of lightning injury if they experience immediate respiratory or cardiac arrest and no treatment is provided.

Patients who do not suffer respiratory or cardiac arrest and those who respond to immediate treatment have an excellent chance of recovery.

Signs and symptoms

- _____
- _____

Pre hospital treatment for lightening

1) Move the patient in a safe area
2) Check CAB, Provide CPR if needed
3) Provide artificial ventilation if needed
4) Finally provide PHT for other injuries.

2.3 Cold Emergencies

Exposure to excessive cold can cause two kinds of emergencies:

- **Hypothermia**
- **Frostbite or local cold injuries**

Hypothermia

When cooling affects the entire body, this causes a condition known as hypothermia, or generalized cooling. Hypothermia can develop in temperatures well above freezing.

_____

_____

_____

Signs and symptoms of mild hypothermia

- _____
- _____
- _____
- _____
- _____
- _____

Signs and symptoms of severe hypothermia

- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment for hypothermia

Handle patient very gently and offer comfort and reassurance. Use universal precautions, secure the scene, and alert EMS.

1) Conduct initial assessment and physical exam.

_____

2) Remove the patient from the cold environment.

_____

3) Maintain open airway and administer oxygen if needed.

_____

4) Remove any wet clothing and cover patient with a blanket. Keep the patient dry.

_____

5) Do not give the patient anything to eat or drink (including hot coffee, tea or alcohol).

_____

6) Constantly assess vital signs.

_____

▸ Frostbite or Local Cold Injuries

This type of injury consists of the freezing or near-freezing of a body part. Usually the toes, fingers, face, nose, and ears are at most risk. Onset is slow, but can occur quickly under high-wind conditions.

Signs and symptoms of frostbite and local cold injuries

- _____
- _____
- _____

Never rub or massage the affected area of a local cold injury. Ice crystals under the skin could damage the fragile capillaries and tissues, making the injury worse.

Pre-hospital treatment for frostbite and local cold injuries

If you suspect hypothermia, treat for hypothermia before treating for frostbite (**"life before limb"**). Use universal precautions, secure the scene and alert EMS .

1) Remove the patient from the cold environment. Do not allow the patient to walk on a frozen limb.

   _____

2) Protect the frozen area from further injury and re-freezing. For an injured extremity, stabilize.

   _____

3) Dry the affected area and apply a clean bandage. Place dressings between the fingers if they are affected. If superficial, cover and keep warm. If deep, apply dry, sterile dressings.

   _____

If transport will be delayed, consider re-warming the affected area.

_____

Late or Deep-cold Injury

Later stages of frostbite are referred to as late or deep-cold injury. In this condition, the skin may appear to be waxy and may be firm to the touch. As freezing continues, it becomes mottled and blotchy. Finally, the area becomes swollen, blistered and white. This type of injury can appear similar to partial thickness (second-degree) burns.

_____

_____

Signs and symptoms of late or deep-cold injury

- Blotches in the skin (spotted). White color appears first, then greyish yellow and finally greyish blue.

  _____

- The surface of the skin will feel frozen in the affected area and the layers of skin below the surface will feel hard to the touch.

  _____

Pre-hospital treatment for late or deep-cold injury

1) Use universal precautions, secure the scene and alert EMS. Provide the same treatment as for frostbite.

   _____

   _____

2) Never _____ an area with deep-cold injury.

   _____

   _____

POST-TEST | LESSON 13

Burns and Environmental Injuries

1. **Fill in the correct type of burn to match the signs and symptoms described:**

   _____: Burns displaying redness and blisters; burns to the epidermis and the dermis.

   _____: Burns that involve the muscle, skin and bone.

   _____: Burns causing redness and pain; only the epidermis is affected.

2. **You are assisting a patient that has been burned by hot oil. The patient presents with burns that cover the anterior trunk as well as the anterior part of the arm and forearm. Using the Rule of Nines, estimate the TBSA.**

   _____

3. **List three steps for pre-hospital treatment of <u>chemical burns</u>.**

   - _____
   - _____
   - _____

4. **List three steps for pre-hospital treatment of <u>electrical burns</u>.**

   - _____
   - _____
   - _____

POST-TEST | LESSON 13

Burns and Environmental Injuries (Cont.)

5. List three signs and symptoms of heat cramps and describe pre-hospital treatment.

   Signs and symptoms

   - _____
   - _____
   - _____

   Pre-hospital treatment

   - _____
   - _____
   - _____

6. List three signs and symptoms of heat exhaustion and describe pre-hospital treatment.

   Signs and symptoms

   - _____
   - _____
   - _____

   Pre-hospital treatment

   1) _____
   2) _____
   3) _____

POST-TEST | LESSON 13

Burns and Environmental Injuries (Cont.)

7. List three signs and symptoms of heat stroke describe pre-hospital treatment.

Signs and symptoms

- _____
- _____
- _____

Pre-hospital treatment

1) _____

2) _____

3) _____

8. List three signs and symptoms of lightening injuries and describe pre-hospital treatment.

Signs and symptoms

- _____
- _____
- _____

Pre-hospital treatment

1) _____

2) _____

3) _____

POST-TEST | LESSON 13

Burns and Environmental Injuries (Cont.)

9. List three signs and symptoms of both mild and severe hypothermia, and list six steps for pre-hospital treatment.

Signs and symptoms of mild hypothermia

- _____
- _____
- _____
- _____

Signs and symptoms of severe hypothermia

- _____
- _____
- _____

Pre-hospital treatment

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____

POST-TEST | LESSON 13

Burns and Environmental Injuries (Cont.)

10. List three signs and symptoms of frostbite and list three steps for pre-hospital treatment.

Signs and symptoms

- _____
- _____
- _____

Pre-hospital treatment

1) _____

2) _____

3) _____

MFR LESSON 13 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course.
Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration ☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?	☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable.
Please turn in this completed form to the instructor.

LESSON

14

POISONING

Duration 02 Periods (Lecture-02 Periods)

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. List the signs and symptoms of poisoning, and steps for pre-hospital treatment.
2. List four specific signs and symptoms of ingested poisons.
3. List four specific signs and symptoms of inhaled poisons.
4. List four specific signs and symptoms of absorbed poisons.
5. List the signs and symptoms of injected poisons, including snakebites, and the steps for pre-hospital treatment.
6. List the signs and symptoms for alcohol abuse and the steps for pre-hospital treatment.

1 Poisons

Definition: Any substance that can impair or cause death of cell structure or function

A poison can enter the body four ways:

- _____
- _____
- _____
- _____

Scene Assessment

Always perform a scene assessment – safety first. Protect yourself, your crew and others from the poison. Use universal precautions. Try to identify the source or substance involved. Get as much information as you can, as quickly as possible.

Perform the initial assessment and obtain the patient's history. Signs and symptoms of poisoning will vary depending on the type of poison.

Write down the telephone number of your local Poison Control Centre:

_____

General signs and symptoms of poisoning

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

In an unexplained unconsciousness patient has a high index of suspicion for poisoning.

Pre-hospital treatment for poisoning

Use universal precautions and secure the scene.
Use special protective equipment when necessary.

1) Move the patient away from the source of the poisoning, especially in inhalation and absorbed poisoning.
2) For absorbed poisons:
   - Remove the patient's _____.
   - Blot the poison from the skin with a _____ _____. If the poison is a drypowder, brush it off.
   - Flood the affected area with copious amounts of _____ until EMS arrives.
3) Maintain _____.
   Administer oxygen per local protocol.
4) Perform initial assessment. Do not perform _____ _____in inhaled or ingested poison cases. Use the BVM.
5) Call your local poison control centre, if available.
6) Perform physical exam.

Pre-hospital treatment for poisoning (Cont.)

7) For ingested poisons:
   - Do not give the patient anything (milk, water or activated charcoal) to dilute the posion unless advised to do so by a poison control center or emergency medical personnel because it may be harmful. Follow your local protocols and always call for medical direction before assisting a patient with medications.
   - Induced vomiting is in poisoning with hydrocarbons, strong acids, alkalis, and corrosives.
   - In case of vomiting, position the patient to prevent aspiration. Save vomit for analysis.

8) Bring the suspected source, container, labels, or other evidence of the poison to the hospital.

9) Treat for shock.

10) Continually monitor the patient.

    Transport the patient.

    When available provide the first aid as advised in the container of the poison taken.

2

Ingested Poisons

An ingested poison is one that is introduced into the digestive tract by way of the mouth. In cases of ingested poison, all information should be obtained as quickly as possible while the initial assessment is performed. Look for signs of spilled liquids, tablets, capsules, poisonous substances or any container that can help you to identify the substance or source of poisoning.

Specific signs and symptoms of ingested poison

- Burns, swelling or stains around the mouth

  _____

- Abnormal breathing

  _____

- Diaphoresis

  _____

- Excessive salivation or foaming at the mouth

  _____

Organophosphorous Poisoining

Organophosphate (OP) compounds are a diverse group of chemicals used in both domestic and industrial settings.

2 Ingested Poisons (Cont.)

Pre-hospital care

Airway control and adequate oxygenation are paramount in organophosphate (OP) poisonings. Intubation may be necessary in cases of respiratory distress due to laryngospasm, bronchospasm, bronchorrhea, or seizures.

1) Transfer the patient to a safe area (away from exposure).
2) Remove all clothing and gently cleanse patients suspected of organophosphate exposure with soap and water because organophosphates are hydrolyzed readily in aqueous solutions with a high pH. Consider clothing hazardous waste and discard accordingly. Irrigate the eyes of patients who have had ocular exposure using isotonic sodium chloride solution or lactated Ringer's solution.
3) Administer oxygen if necessary.
4) Transfer to hospital immediately.

_____

_____

3 Inhaled Poisons

Poisoning caused by fumes and vapors can be swift. The body absorbs inhaled poisons very rapidly. The longer the exposure the worse the prognosis. You may need to use special masks to gain access to the patient in a hazardous environment. Additional expert help may be required. Signs and symptoms of ingested poisoning is more related to the respiratory system.

Though it is important to give care immediately, do not enter the scene unless you are sure it is safe.

Scene Assessment

Assessment of inhaled poisons can be very dangerous. To ensure your safety, be wary of peculiar _____ or visible _____. If you are not properly equipped or trained, have trained personnel bring the patient to you. Do not enter the scene unless it is _____. Search for other victims. Try to get specific information on the poison and the patient's medical information as soon as possible.

3

Inhaled Poisons (Cont.)

Carbon Monoxide Poisoining

Carbon monoxide poisoning occurs after the inhalation of carbon monoxide gas.Carbon monoxide (CO) is a product of combustion of organic matter under conditions of restricted oxygen supply, which prevents complete oxidation to carbon dioxide. Carbon monoxide is colorless, odorless, tasteless, and non-irritating, making it difficult for people to detect.

Carbon monoxide binds to hemoglobin (reducing oxygen transportation), myoglobin (decreasing its oxygen carrying capacity), and mitochondrial cytochrome oxidase (inhibiting cellular respiration).

Pre-hospital treatment

1) First aid for carbon monoxide poisoning is to immediately remove the victim from the exposure without endangering oneself.
2) Call for help.
3) Apply CPR if needed.
4) The main medical treatment for carbon monoxide poisoning is 100% oxygen by a tight fitting oxygen mask. Oxygen hastens the dissociation of carbon monoxide from hemoglobin, improving tissue oxygenation by reducing its biological half-life.
5) Transport to hospital as soon as possible.

3

Inhaled Poisons (Cont.)

It is important to obtain the patient's information or that of witnesses as soon as possible, to look for indications of inhaled poison.

Common inhaled poisons

- Carbon monoxide

  _____

- Carbon dioxide from industrial sites, sewers, and wells

  _____

- Chlorine gas (common around swimming pools)

  _____

- Fumes from liquid chemicals and sprays

  _____

- Ammonia

  _____

- Sulphur dioxide (used to make ice)

  _____

- Anesthetic gases (ether, nitrous oxide, chloroform)

  _____

- Dry cleaning solvents, degreasing agents, or fire extinguishers

  _____

- Industrial gases

  _____

- Incomplete combustion of natural gas

  _____

- Hydrogen sulphide (sewer gas)

  _____

Specific signs and symptoms of inhaled poison

- History of _____
- Chest pain or chest tightness
- _____ sensation in chest or throat
- Coughing, wheezing, or rales

4 Absorbed Poisons

An absorbed poison is one that enters the body through contact with the skin. Examples of natural sources include poison ivy, poison sumac and poison oak (akk). Man-made sources include corrosives, insecticides, herbicides and cleaning agents. Signs and symptoms of absorbed poisons are more related to skin involvement.

_____

_____

_____

Specific signs and symptoms of absorbed poisons

- _____
- _____
- _____
- _____

5 Injected Poisons

Injection poisoning occurs when a poison enters the body through a break in the skin. The break can be caused by a needle (drugs), an insect bite or sting, or puncture.

Scene Assessment

During scene assessment, look for clues such as syringes and drug paraphernalia. Inspect surroundings for animals, insects or marine life. Conduct initial assessment, paying close attention to airway breathing. Monitor mental status and priorities patients for transport. Obtain a focused history and perform a physical exam. Get information on the suspected poison or its origin. Try to find answers to the following Questions:

- Is there a history of drug abuse?

  _____

- Any history of allergic reaction to bites or stings?

  _____

- How long from time of injection to onset of signs or symptoms?

  _____

5

Injected Poisons (Cont.)

Specific signs and symptoms of injected poisons

- _____ _____
- Pain, swelling, or redness at the _____
- History of _____ or _____
- Bite mark or stinger embedded in the skin
- _____ at the injury site after a few hours
- Other symptoms similar to ingested poisons

Pre hospital treatment for injected poisons

Use universal precautions and secure the scene.

1) Maintain open airway.

_____

2) Administer oxygen. Be alert for possible patient vomiting.

_____

3) Protect yourself and the patient from repeated injections. Cut off patient's clothing to protect from possible repeated insect stings or bites.

_____

4) For **bee stings**, remove the stinger together with the poison sac. Use a plastic card and scrape the skin's surface to keep the sac from breaking inside the patient's skin. Place a bag of ice or cold pack on the sting.

_____

5) Bring all containers, labels, or other evidence of poisoning to the hospital.

_____

6) Conduct a physical exam.

_____

7) Treat for shock.

_____

8) Monitor the patient during transport.

_____

5

Injected Poisons (Cont.)

Snake Bites

These are quite common in certain areas. Signs and symptoms may delay several hours before presenting. Death can occur quickly if the patient has an allergic reaction to the venom.

Treat all snakebites as poisonous.

Specific signs and symptoms for poisonous snake bites

- Nausea and vomiting

  _____

- Weakness, paralysis

  _____

- Seizures, decreased level of consciousness

  _____

- Puncture wound

  _____

- Pain and/or burning sensation around the bite mark

  _____

- Blood oozing from the bite mark

  _____

- Discoloration and swelling

  _____

5 Injected Poisons (Cont.)

Pre-hospital treatment for snake bites

Use universal precautions and secure the scene.

1) Move the patient to a safe place.

_____

2) Calm the patient and try to place him/her in a comfortable position.

_____

3) Locate the bite marks and clean them with water and soap.

_____

4) Remove rings, bracelets and any restrictive garments from the affected extremity. **Do not apply** _____ (constricting band is recommended), **do not make** _____ _____ around the bite marks, and **do not** _____ the venom from the wound.

_____

5) Treat for shock and provide basic life support as needed.

_____

6) Do not give the patient any food or drink.

_____

7) Identify the snake.

_____

8) Administer oxygen if needed.

_____

9) Continually monitor the patient during transport.

_____

5 Injected Poisons (Cont.)

Only anti-venin works as an antidote for a poisonous snake bite.

Anti-venin serum must be administered on the basis of three criteria:

- _____
- _____
- _____

6 Alcohol Abuse

Abuse of this drug leads to alcoholism and serious chronic intoxication with great physical and mental deterioration. A patient under the influence of alcohol can be dangerous to him/herself and to others.

If the patient allows it, conduct an initial assessment and physical exam including an interview; the assistance of friends and witnesses can be very helpful.

_____

_____

Specific signs and symptoms of alcohol abuse/poisoning

- The _____ of alcohol on the breath and/or clothes.
- _____
- _____
- _____
- _____
- _____

6

Alcohol Abuse (Cont.)

Pre-hospital treatment for alcohol abuse/poisoning

Use universal precautions and secure the scene. Persons with alcohol poisoning can injure others or themselves.

1) Verify whether it is strictly a case of alcohol abuse (determine if patient is diabetic).

_____

2) Allow EMS to decide if police intervention is required.

_____

3) Monitor vital signs and stay alert for breathing problems. Be alert for vomiting and take steps to prevent aspiration.

_____

4) Protect the patient from injury without using restrictive means.

_____

5) Give oxygen if needed.

_____

Transport the patient.

Signs and symptoms of Alcohol Withdrawal (Delirium Tremens)

An alcoholic who suddenly stops drinking alcohol (abstinence) can suffer serious problems. Sudden abstinence often leads to **delirium tremens** (DT).

- _____
- _____
- _____
- _____
- _____

POST-TEST | LESSON 14

Poisoning

1. **List the signs and symptoms of poisoning, and the steps for pre-hospital treatment.**

Signs and symptoms

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment

1) _____

2) For absorbed poisons:

- _____
- _____
- _____

3) _____

4) _____

5) _____

6) _____

POST-TEST | LESSON 14

Poisoning (Cont.)

7) For ingested poisons:

- _____
- _____
- _____

8) _____

9) _____

10) _____

2. **List four specific signs and symptoms of <u>ingested poisons</u>.**

- _____
- _____
- _____
- _____

3. **List four specific signs and symptoms of <u>inhaled poisons</u>.**

- _____
- _____
- _____
- _____

4. **List four specific signs and symptoms of <u>absorbed poisons</u>.**

- _____
- _____
- _____
- _____

POST-TEST | LESSON 14

Poisoning (Cont.)

5. **List the signs and symptoms of injected poisons, including snakebites, and the steps for pre-hospital treatment.**

Signs and symptoms

- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment

1) _____

2) _____

3) _____

4) Remove rings, bracelets and any restrictive garments from the affected extremity. **Do not apply** _____, **do not make** _____around the bite marks, and **do not** _____ the venom from the wound.

5) _____

6) _____

7) _____

8) _____

9) _____

POST-TEST | LESSON 14

Poisoning (Cont.)

6. List the signs and symptoms for alcohol abuse and the steps for pre-hospital treatment.

Signs and symptoms

- _____
- _____
- _____
- _____

Pre-hospital treatment

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____

POST-TEST | LESSON 14

Poisoning (Cont.)

7. List the signs and symptoms for drug abuse and the steps for pre-hospital treatment.

Signs and symptoms

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____
8) _____
9) _____
10) _____

MFR LESSON 14 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course.
Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration ☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?	☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable.
Please turn in this completed form to the instructor.

LESSON PLAN

15

MEDICAL EMERGENCIES,

PART 1: CARDIOVASCULAR EMERGENCIES AND ABDOMINAL DISTRESS

Duration	• 02 Periods • (Lecture-02 Periods)
Materials:	• Powerpoint presentation • Computer • Multimedia projector and screen • Flipcharts • Handout

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. Define a medical emergency.
2. Define angina pectoris, list six signs and symptoms, and describe pre-hospital treatment.
3. Define myocardial infarction, list nine signs and symptoms, and list eight steps for pre-hospital treatment.
4. Define congestive heart failure, list eight signs and symptoms, and four steps for pre-hospital treatment.
5. Define hypertension, list five signs and symptoms and five steps for pre-hospital treatment.
6. List ten signs and symptoms of abdominal distress and list five steps for pre-hospital treatment

1 Medical Emergency

Definition: A critical state caused by a wide variety of illnesses whose cause does not include trauma to the patient.

Such a state can be caused by germ pathogens (microorganisms), alteration in the functioning of organ, or foreign substances, such as poisons. In most cases, the problem is not a consequence of trauma.

If the patient presents with a typical vital signs, assume that the patient has a medical emergency.

The most common cardiovascular medical emergencies are:

- _____
- _____
- _____
- _____
- _____

1

Medical Emergency (Cont.)

1.1 Detection

- Medical emergencies can create a situation leading to trauma and may remain unnoticed. Always consider the possibility that an underlying medical emergency may have lead to the traumatic event.

_____

_____

_____

- Trauma can induce a medical emergency. Conduct an initial assessment and physical exam and continue monitoring the patient closely.

_____

_____

_____

_____

1.2 Signs of a Medical Emergency

If the patient presents with _____ vital signs, assume that the patient has a medical emergency. Changes in any of the following can indicate a medical emergency:

- Mental status (unconscious, confused, comatose)

_____

- Heart rate, rhythm and/or quality

_____

- Breathing rate, rhythm, and/or quality

_____

- Skin temperature, colour and/or condition

_____

1

Medical Emergency
(Cont.)

- Pupil size, symmetry, and reactivity to light

- Condition and colour of the mucous membranes (dryness, paleness, cyanosis)

- Breath scent (alcohol, acetone)

- Muscular activities (spasms and paralysis)

- Nausea or vomiting

In an adult patient, the following conditions may indicate a possible medical emergency:

- **Heart rate above 100 or less than 60 bpm.**
- **Respiratory rate less than 12 or more than 20 rpm.**

1.3 Symptoms of a Medical Emergency

**Consider all patients' complaints as valid.
If the patient complains of not feeling well,
assume that he/she is having a medical emergency.**

- _____
- _____
- _____
- _____
- Shortness of breath or difficulty breathing

  _____
- Chest or abdominal pain

  _____
- Excessive thirst, hunger or strange taste in the mouth

  _____
- Sensation of numbness and/or tingling

  _____

1.4 Causes of Heart Diseases

- The heart is a muscle that is oxygenated by the coronary arteries.

- Arteriosclerosis refers to the general stiffening and thickening of artery walls, which can occur due to various factors, including aging and high blood pressure.

- Atherosclerosis is a specific type of arteriosclerosis where plaques of fat, cholesterol, and other substances build up inside the arteries, leading to reduced blood flow.

- When the coronary arteries are narrowed, the amount of oxygen supplied to the muscle is reduced and the patient experiences chest pain. This pain is called ***angina pectoris***.

- When the coronary arteries are obstructed, oxygen cannot reach the muscle. This part of the muscle then dies, causing a condition called a ***myocardial infarction***. It is the consequence of an occlusion of one or several of the coronary arteries.

- If the patient loses too much of the heart muscle, the heart will be unable to pump enough blood to supply the rest of the body. This leads to shock and soon after, death.

NOTE:- • Arteriosclerosis refers to the general stiffening and thickening of artery walls, which can occur due to various factors, including aging and high blood pressure.

• **Atherosclerosis** is a specific type of arteriosclerosis where plaques of fat, cholesterol, and other substances build up inside the arteries, leading to reduced blood flow.

2

Cardiovascular Emergencies

2.1 Myocardial Infarction

Definition: Literally meaning "death of the heart," caused by partial or total blockage of blood flow to the heart, leading to death of cardiac muscle tissue.

Myocardial infarction is commonly known as "heart attack".

Signs and symptoms of myocardial infarction

- Chest discomfort, such as pain or heaviness. The common location is substernal, radiating to the neck, jaw, left shoulder and/or left arm, rarely to abdomen.
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

If any of the above signs or symptoms is present, assume that the patient is having or will soon have a myocardial infarction.

Pre-hospital treatment for myocardial infarction

Use universal precautions and secure the scene.

1) Instruct the patient to stop all movement.

2) Place the responsive patient in a comfortable position, usually semi-reclining or sitting.

3) Maintain open airway.

4) Administer oxygen per local protocol. If needed, provide artificial ventilation or CPR.

5) Loosen restrictive clothing.

6) Maintain body temperature as close to normal as possible.

7) Comfort and reassure the patient.

8) Constantly monitor the patient's vital signs.

2.2 Angina Pectoris

Definition:
Chest pain.

This condition is the result of reduced oxygen supply to the heart muscle (myocardium). It can be caused by diseased or narrowed arteries which reduce blood flow. Angina is often brought on by exertion or stress, and rarely lasts longer than 3 to 5 minutes.

Signs and symptoms of angina pectoris

- _____
- _____
- _____
- _____
- _____
- _____

It is impossible to distinguish between angina and the pain of a heart attack. Though it does not cause permanent damage to the heart, angina can eventually lead to a heart attack.

Pre-hospital treatment for angina pectoris

_____

_____

_____

2.3 Congestive Heart Failure

Definition: A condition of excessive fluid build-up in the lungs and/or other organs due to inadequate pumping of the heart.

This condition is called "congestive" because the fluids congest, or clog, the organs. Congestive heart failure is often a complication of myocardial infarction, and can also be brought on by diseased heart valves, hypertension and pulmonary diseases such as emphysema.

Signs and symptoms of congestive heart failure

- Shortness of breath, made worse by lying flat
- Rapid heart rate
- Anxiety
- Increased respiratory rate
- Normal to high blood pressure
- Jugular vein distension
- Swollen ankles
- Cyanosis

The patient with congestive heart failure may not always experience chest pain.

Pre-hospital treatment for congestive heart failure

Use universal precautions and secure the scene.

1) Maintain open airway and monitor breathing. Provide artificial ventilation if needed.

_____

2) Place the responsive patient in a comfortable position, usually sitting upright.

_____

3) Give oxygen if needed.

_____

4) Continuously monitor the patient and provide emotional support.

_____

Transport the patient as soon as possible.

2.4 Hypertension

Definition: Blood pressure that remains consistently above the normal values.

Signs and symptoms

- _____
- _____
- _____
- _____
- Seeing "stars" _____
- Nosebleed (epistaxis) _____
- Diastolic blood pressure above _____ mmHg. _____
- Tingling in _____

Pre-hospital treatment for hypertension

Use universal precautions and secure the scene.

1) Maintain open airway.

_____

2) Place the responsive patient in a comfortable position, usually sitting upright.

_____

3) Provide emotional support.

_____

4) Control nosebleed, if present.

_____

Transport the patient as soon as available.

3

Abdominal Distress

Definition:
A sharp, severe abdominal pain with rapid onset.

Abdominal pain can have sudden onset or build up gradually over a period of time. Severe abdominal pain may not always reflect a serious condition, but must always be treated as serious by the MFR until a full diagnosis is made by a doctor.

Causes of abdominal distress

There are multiple causes of abdominal pain, all requiring immediate attention. These disorders have four general causes: inflammation, infection, obstruction and hemorrhage. These conditions can be brought on by, but are not limited to, the following:

- Acute appendicitis
- Perforated ulcer
- Intestinal obstruction
- Ectopic pregnancy or other gynecological emergencies
- Closed abdominal trauma (ruptures, hemorrhages)

The above list does not include all causes of abdominal pain.

Signs and symptoms of abdominal distress

- Abdominal pain, local or diffuse.

  _____

- Colicky pain (cramps that occur in waves)

  _____

- Abdominal tenderness, local or diffuse.

  _____

- Anxiety, reluctance to move

  _____

- _____
- _____
- _____
- _____
- Vomiting blood _____
- _____

  Many times a patient with abdominal pain will be found in a guarding position.

3

Abdominal Distress
(Cont.)

Pre-hospital treatment of abdominal distress

Use universal precautions and secure the scene.

1) Maintain open airway and prevent aspiration of vomit. Have patient lie in comfortable position, preferably the left side if nauseated.

2) Administer oxygen if needed.

3) Treat for shock.

4) Do not give anything by mouth.

5) Keep a vomit sample for analysis (take precautions to prevent contamination).

6) Continually monitor vital signs while transporting the patient.

Transport the patient as soon as possible.

POST-TEST | LESSON 15

Medical Emergencies, Part 1:

Cardiovascular Emergencies and Abdominal Distress

1. **Define a medical emergency.**

_____

_____

2. **Define myocardial infarction, list nine signs and symptoms, and list eight steps for pre-hospital treatment.**

Definition _____

_____

Signs and symptoms

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

POST-TEST | LESSON 15

Medical Emergencies, Part 1:

Cardiovascular Emergencies and Abdominal Distress (Cont.)

3. **Define angina pectoris, list six signs and symptoms, and describe pre-hospital treatment.**

Definition

_____

Signs and symptoms

- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment

- _____
- _____
- _____
- _____

POST-TEST | LESSON 15

Medical Emergencies, Part 1:

Cardiovascular Emergencies and Abdominal Distress (Cont.)

4. Define congestive heart failure, list eight signs and symptoms, and list four steps for pre-hospital treatment.

Definition

_____

Signs and symptoms

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment for congestive heart failure

1) _____

2) _____

3) _____

4) _____

POST-TEST | LESSON 15

Medical Emergencies, Part 1:

Cardiovascular Emergencies and Abdominal Distress (Cont.)

5. **Define hypertension, list five signs and symptoms and list five steps for pre-hospital treatment.**

Definition

_____

Signs and symptoms

- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment for hypertension

1) _____
2) _____
3) _____
4) _____
5) _____

POST-TEST | LESSON 15

Medical Emergencies, Part 1:

Cardiovascular Emergencies and Abdominal Distress (Cont.)

6. **List ten signs and symptoms for <u>abdominal distress</u> and list five steps for pre-hospital treatment.**

Signs and symptoms

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Pre-hospital treatment

1) _____

2) _____

3) _____

4) _____

5) _____

MFR LESSON 15 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course. Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level** ☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration ☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?	☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable. Please turn in this completed form to the instructor.

LESSON

16

MEDICAL EMERGENCIES,
PART 2: RESPIRATORY EMERGENCIES

Duration • 02 Periods • (Lecture-02 Periods)

LESSON OBJECTIVES

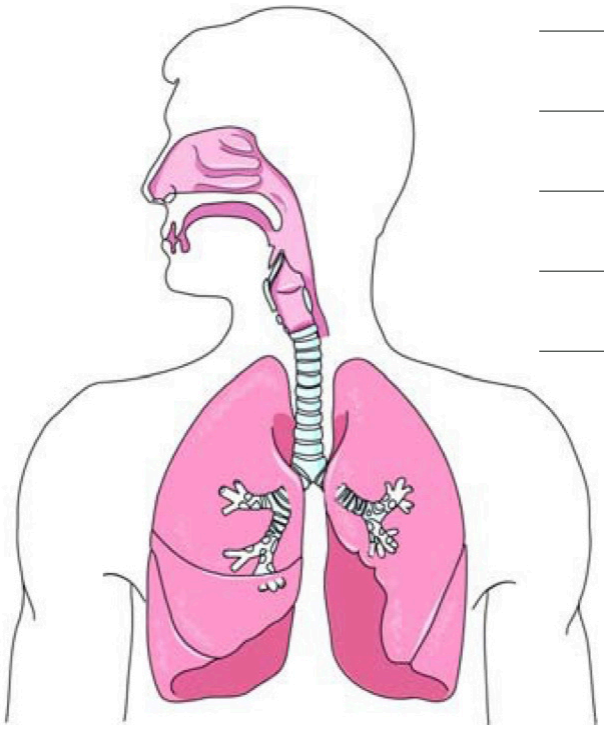
Upon completion of this lesson, you will be able to:

1. Define respiratory distress.
2. List four causes of respiratory distress.
3. List seven signs and symptoms of respiratory distress.
4. List five steps for pre-hospital treatment of respiratory distress.
5. List eight signs and symptoms of toxic product inhalation.
6. List five steps for pre-hospital treatment of toxic product inhalation.

1 Respiratory Distress

Definition: Shortness of breath or a feeling of air hunger with laboured breathing.

Respiratory distress also known as 'dyspnea, affects one's ability to exchange oxygen and carbon dioxide. Respiratory medical emergencies have common signs and symptoms inherent to all types of breathing difficulties. Respiratory distress is characterized by quick, labored breathing, shortness of breath and the sensation of unavailable air. It can produce a blue coloration (cyanosis) of the skin and mucous membranes.



1

Respiratory Distress (Cont.)

Signs and symptoms of a respiratory emergency

- Inability to speak in full sentences without pausing to breathe

_____

- Noisy breathing

_____

- Use of accessory muscles to breathe

_____

- Tripod positioning, leaning forward, sitting upright

_____

- Abnormal breathing rate or pattern

_____

- Increased pulse rate

_____

- Poor skin colour (cyanotic, pale, or ashen)

_____

1 Respiratory Distress or Dyspnea (Cont.)

Pre-hospital treatment for respiratory distress

Use universal precautions and secure the scene.

1) Move the patient away from the contaminated area (if the cause is toxic product inhalation).

_____

2) Assess patient's breathing to determine if adequate.
Provide artificial ventilation if needed.
Maintain open airway.

_____

3) Position the responsive patient in a comfortable position, usually sitting upright.

_____

4) Administer oxygen if needed, or as per local protocol.

_____

5) Comfort and reassure the patient by providing emotional support.

_____

Transport the patient as soon as possible.

2

Causes of Medical Respiratory Distress

The following conditions are among the more common respiratory problems you will encounter in the field. It is not necessary to diagnose a patient's condition; in fact, the care for all respiratory conditions is essentially the same for the medical first responder.

▸ Bronchial Asthma

Bronchial asthma is an _____ illness characterized by the narrowing of the large air passages called the bronchi and wheezing. The patient experiences difficulty _____the lungs. This is usually due to a spasm of thin muscle that lines the bronchial walls. Asthma is generally triggered by allergens, strong scents, irritating gases, smoke and weather changes.

_____

_____

_____

▸ Chronic Obstructive Pulmonary Disease (COPD)

Emphysema and chronic bronchitis are the most common forms of COPD. Emphysema causes the alveoli to loose their _____ and become distended. This traps air and prevents the alveoli from working correctly. As more and more alveoli become affected, breathing becomes increasingly difficult for the patient. Chronic bronchitis is characterized by excessive mucus becoming trapped in the large air passages of the bronchial tree. Patients diagnosed with this condition will suffer from a _____. Patients who have COPD usually have a history of smoking; however, it is also common among people who live in areas of high air pollution.

_____

_____

_____

2

Causes of Medical Respiratory Distress (Cont.)

▸ COVID-19 Infection

COVID-19, the illness caused by the _____, starts with droplets from an infected person's cough, sneeze, or breath. Acute respiratory distress syndrome (ARDS) begins a few days later. ARDS can cause rapid breathing, a _____, _____, and _____. It damages the tissues and blood vessels in alveoli, causing debris to collect inside them. This makes it harder or even impossible for to breathe. As fluid collects in your lungs, they carry less oxygen to your blood. That means your blood may not supply your organs with enough oxygen to survive. This can cause your kidneys, lungs, and liver to shut down and stop working. This would lead to multi-organ failure and ultimately death of the victim. Victim needs to be provided with immediate symptomatic treatment with _____ drug combinations and may need enriched oxygenations and even mechanical ventilation by ventilators.

_____

_____

▸ Anaphylaxis

Anaphylaxis is an acute, severe _____ reaction that puts the patient's life in immediate danger. The reaction may be triggered by many different routes of exposure, including direct skin contact, ingestion, and inhalation. Exposure to the allergen will cause blood vessels to dilate rapidly and cause a _____ in blood pressure (hypotension). Many tissues may swell, including those lining the respiratory system. This swelling can _____, leading to respiratory failure. Signs and symptoms frequently observed are urticaria, oedema in the face, lips and neck. In extreme cases, oedema can appear in the larynx and glottis making it difficult for the patient to breathe.

_____

_____

2

Causes of Medical Respiratory Distress (Cont.)

▸ Anaphylactic Shock

Definition: A life-threatening reaction of the body caused by something to which the patient is extremely allergic.

This condition represents a true emergency where immediate transportation to a medical centre is imperative.

Causes of anaphylactic shock

- _____
- _____
- _____
- _____
- _____

Signs of anaphylactic shock

Skin: _____

_____

Breathing: _____

_____

Pulse: _____

_____

State of consciousness: _____

_____

Pre-hospital treatment for anaphylactic shock

When you interview the patient, ask if he or she is allergic to anything and if they were in contact with that substance.

2 Causes of Medical Respiratory Distress (Cont.)

As with any type of shock, treat the patient with total care (see pre-hospital treatment of shock). The patient needs medication to combat the allergic reaction. Transport the patient immediately.

▸ Hyperventilation

Hyperventilation is a condition characterized by breathing too fast. It is normal for most people, such as when they are frightened, as long as the rate of breathing quickly returns to normal.

Hyperventilation syndrome is an abnormal state in which rapid breathing persists. It is commonly associated with _____. Symptoms include rapid and deep breathing, chest pain, dizziness, faintness, and numbness around the mouth, hands and feet. Not every patient who is breathing rapidly or deeply is hyperventilating. Several serious conditions may be the cause, including fever, infections, trauma, diabetes or overdose.

Hyperventilation is a relatively common respiratory emergency that can often be corrected by _____ _____. If the patient does not respond immediately, administer oxygen per local protocol; this will not make hyperventilation worse.

Avoid using the traditional method of treating anxiety-induced hyperventilation by having the patient to breathe into a paper bag. Caution should be exercised when using this technique. Remember to allow the patient to receive enough oxygen.

If breathing does not improve with the explained measures, assume that the problem is more serious.

3

Toxic Product Inhalation

Many fire-related deaths are due to problems associated with the inhalation of toxic products of combustion rather than from burns. Fire-related injury can affect the patient two different ways: **pulmonary thermal injury** (burning of the airways) and **toxic product inhalation**. Fluid in the lungs (oedema) may develop from pulmonary thermal injury when surrounding temperatures exceed 50°C (120°F). Carbon monoxide and ammonia are common examples of inhaled toxic products.

Signs and symptoms of toxic product inhalation

- Irritation and inflammation of air passages, eyes and nose
- Altered frequency and depth of breathing
- Possible cardio-respiratory arrest
- Singed nasal hairs
- Dusty grey spittle
- Wheezing and noisy breathing
- Coughing
- Hoarseness

3 Toxic Product Inhalation (Cont.)

Pre-hospital treatment for toxic product inhalation

Use universal precautions and secure the scene.

1) Remove the patient from the contaminated area.

2) Conduct initial assessment and apply basic life support as necessary.

3) If the patient is breathing and does not have any signs of neck or spinal trauma, place the patient in a comfortable seated position.

4) Administer oxygen per local protocol.

5) Treat for shock.

Transport the patient as soon as possible.

POST-TEST | LESSON 16

Medical Emergencies, Part 2:

Respiratory Emergencies

1. Define respiratory distress.

_____

_____

2. List four causes of respiratory distress.

- _____
- _____
- _____
- _____

3. List seven signs and symptoms of respiratory distress.

- _____
- _____
- _____
- _____
- _____
- _____
- _____

4. List five steps for pre-hospital treatment of respiratory distress.

1) _____
2) _____
3) _____
4) _____
5) _____

POST-TEST | LESSON 16

Medical Emergencies, Part 2:

Respiratory Emergencies (Cont.)

5. **List eight signs and symptoms of toxic product inhalation.**

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

6. **List five steps for pre-hospital treatment of toxic product inhalation.**

1) _____
2) _____
3) _____
4) _____
5) _____

MFR LESSON 16 EVALUATION

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