CHAPTER 25

Bleeding and Shock

HANDOUT 25-1: Evaluating Content Mastery Student's Name

EVALUATION

CHAPTER 25 QUIZ

Write the letter of the best answer in the space provided.

_____ **1.** A blood vessel that carries oxygen-depleted blood back to the heart is called a(n):

A. capillary. **C.** vein.

B. aorta. **D.** artery.

_____ **2.** The inability of the body to adequately circulate blood and oxygen to the body's cells is known as:

A. perfusion. **C.** hypoperfusion.

B. avulsion. **D.** compensated shock._____ **3.** The first step that an EMT should take when treating a patient with severe bleeding is to:

A. apply pressure to the wound. **C.** check the patient's blood pressure.

B. don protective gloves. **D.** apply a tourniquet._____ **4.** The most difficult type of bleeding to control is:

A. arterial bleeding. **C.** capillary bleeding.

B. venous bleeding. **D.** "oozing" bleeding.

_____ **5.** All of the following are signs of shock EXCEPT:

A. altered mental status. **C.** warm, dry skin.

B. nausea and vomiting. **D.** vital sign changes.

_____ **6.** After taking Standard Precautions, the next step an EMT should take in treating cases of profuse bleeding is to:

A. elevate the extremity. **C.** apply bandaging.

B. apply a dressing. **D.** apply direct pressure.

_____ **7.** All of the following are mechanisms of blunt trauma that may cause internal bleeding EXCEPT:

A. falls. **C.** auto–pedestrian collisions.

B. impaled objects. **D.** motor vehicle crashes.

_____ **8.** The type of shock seen most commonly by EMTs is:

A. hypovolemic shock. **C.** neurogenic shock.

B. cardiogenic shock. **D.** irreversible shock.

_____ **9.** A condition in which nerve paralysis causes uncontrolled dilation of blood vessels is called:

A. compensated shock. **C.** cardiogenic shock.

B. hemorrhagic shock. **D.** neurogenic shock.

_____ **10.** The recommended maximum on-scene time in caring for a trauma or shock patient should be:

A. 5 minutes. **C.** 15 minutes.

B. 10 minutes. **D.** 20 minutes.

HANDOUT 25-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

The emergency medical dispatcher sends your unit to an accident at a local baseball field. She reports, "A 12-year-old boy fell and cut his leg on some broken glass."

When you arrive on the scene, the boy's mother is applying pressure to the wound with a handkerchief. Both the handkerchief and a patch of ground near the boy are blood soaked.

You observe that the boy looks pale. His pulse and respiratory rate is rapid. The mother wants you to bandage the wound quickly so she can take the boy to the family doctor. As you talk to the mother, the boy lies down on the ground. "I feel tired," he says. The boy closes his eyes and starts to shiver.

1. Does the boy have an external or internal hemorrhage?

2. What care steps will you take to control bleeding? Why?

3. Do you feel that the boy should be transported to the hospital? Why or why not?

4. How will you handle the parent's request to take the child to the family doctor?

HANDOUT 25-3: Reinforcing Content Mastery Student's Name

REINFORCEMENT

CHAPTER 25 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. The _____ system is responsible for the distribution of blood to all parts of the body.

2. The circulatory system has three main components: the _____, the _____ _____, and the _____.

3. The three major types of blood vessels include _____, _____, and _____.

4. The adequate circulation of blood and oxygen throughout the body is known as _____.

5. A decrease in adequate circulation of blood and oxygen to the body's cells and tissues is known as _____.

6. Severe bleeding, or _____, is the major cause of shock among patients encountered by EMTs.

7. _____ bleeding is often rapid and profuse, spurting with each heartbeat.

8. In treating patients with external bleeding, patient assessment and care always begins with the _____.

9. Application of a(n) _____ _____ will control

most external bleeding.

10. Traumatic injuries resulting in a fractured skull may cause bleeding and/or loss of _____ _____ from the ears or nose.

11. _____ _____ is the leading cause of internal injuries and bleeding.

12. Care for the patient with internal bleeding centers around the prevention and treatment of _____.

13. _____ shock exists when the body has lost the battle to maintain perfusion to the organ systems.

14. An important point to remember is that prompt _____ is an important intervention in trauma care.

15. When giving a report to the hospital by radio, it is important for an EMT to " _____ _____ _____" of the patient.

HANDOUT 25-4: Reinforcing Content Mastery Student's Name

REINFORCEMENT

TRAUMA LISTING

Complete the following lists.

1. List five functions of the blood.

_____

_____

_____

_____

_____

2. List three types of external bleeding.

_____

_____

_____

3. List two major methods of controlling external bleeding.

_____

_____

4. List eight possible signs of internal bleeding.

_____

_____

_____

_____

_____

_____

_____

_____

5. List three major types of shock.

_____

_____

_____

HANDOUT 25-5: Reinforcing Content Mastery Student's Name

REINFORCEMENT

TRAUMA MATCHING

Write the letter of the term next to the appropriate description.

A. Circulatory system

B. Artery

C. Capillary

D. Vein

E. Perfusion

F. Hypoperfusion

G. Arterial bleeding

H. Venous bleeding

I. Capillary bleeding

J. Hemostatic agent

K. Tourniquet

L. Decompensated shock

M. Compensated shock

N. Cardiogenic shock

O. Hemorrhage

_____ **1.**Device for bleeding control on an extremity

_____ **2.**Inability of the body to adequately circulate blood to the cells and tissues

_____ **3.**Especially severe bleeding

_____ **4.** Adequate circulation of blood and oxygen to the body

_____ **5.** Blood vessel that carries blood back to the heart

_____ **6.** Slow and oozing blood; minor injury subject to infection

_____ **7.** Distributes blood to all parts of the body

_____ **8.** Type of shock in which the body is entering shock but is still able to maintain perfusion

_____ **9.** Shock, or lack of perfusion, brought on by inadequate pumping action of the heart

_____ **10.** A special bandage or substance designed to aid clotting

_____ **11.** Microscopic blood vessel where exchanges of oxygen and carbon monoxide occur

_____ **12.** Steady flow of dark red or maroon-colored blood

_____ **13.** Blood vessel with thick muscular walls that carries blood away from the heart

_____ **14.** Type of shock in which the body is no longer able to maintain perfusion adequately

_____ **15.** High-pressure, rapid, spurting bleeding

Chapter 25 Answer Key

HANDOUT 25-1: Chapter 25 Quiz

1. C
2. C
3. B
4. A
5. C
6. D
7. B
8. A
9. D
10. B

HANDOUT 25-2: In the Field

1. The boy has an external hemorrhage, as there is visible bleeding.
2. To control bleeding, apply dressings over the blood-soaked handkerchief and secure with a bandage to make a pressure dressing. Then elevate the limb. If this does not control bleeding, a tourniquet should be applied above the injury.
3. The boy should be transported as quickly as possible. He has apparently lost a large quantity of blood, which can be serious if calculated against his size, age, and build. He is also showing signs of shock. Children compensate very efficiently but can decline rapidly once decompensated shock begins.
4. The mother should be taken aside. The boy's condition should then be explained to her in

nontechnical terms. The EMT might offer to have medical direction call the doctor to meet the ambulance at the hospital. If the mother refuses transport, the EMT should have her sign appropriate documents. Witnesses should also sign.

HANDOUT 25-3: Chapter 25 Review

1. circulatory (or cardiovascular)
2. heart; blood vessels; blood
3. arteries; capillaries; veins
4. perfusion
5. hypoperfusion
6. hemorrhage
7. Arterial
8. ABCs
9. pressure dressing
10. cerebrospinal fluid
11. Blunt trauma
12. shock
13. Irreversible
14. transportation
15. paint a picture

HANDOUT 25-4: Trauma Listing

1. Transportation of gases; Nutrition; Excretion; Protection; Regulation
2. Arterial bleeding; Venous bleeding; Capillary bleeding

3. Direct pressure; Tourniquet

4. Injuries to the surface of the body that may indicate underlying injuries; Bruising; Painful, swollen, or deformed extremities; Bleeding from the mouth, rectum, vagina, or other body orifice; Tender, rigid, or distended abdomen; Vomiting a coffee-ground-like substance or bright red vomitus; Dark, tarry stools or bright red blood in the stool; Any of the signs or symptoms associated with shock

5. Hypovolemic shock; Cardiogenic shock; Neurogenic shock

HANDOUT 25-5: Trauma Matching

1. K

2. F

3. O

4. E

5. D

6. I

7. A

8. M

9. N

10. J

11. C

12. H

13. B

14. L

15. G

CHAPTER 26

Soft-Tissue Trauma

HANDOUT 26-1: Evaluating Content Mastery Student's Name

EVALUATION

Chapter 26 Quiz

Write the letter of the best answer in the space provided.

_____ **1.** All the following are considered soft tissues of the body EXCEPT:

A. muscles. **C.** glands.

B. blood vessels. **D.** cartilage.

_____ **2.** The outer layer of the skin is called the:

A. subcutaneous layer. **C.** dermis.

B. cutaneous layer. **D.** epidermis.

_____ **3.** Specialized nerve endings involved with the senses of touch, cold, heat, and pain are found in the:

A. subcutaneous layer. **C.** dermis.

B. cutaneous layer. **D.** epidermis.

_____ **4.** All the following are examples of closed wounds EXCEPT a(n):

A. contusion. **C.** bruise.

B. hematoma. **D.** abrasion.

_____ **5.** Open wounds in which flaps of skin and tissue are torn loose or pulled off completely are called:

A. avulsions. **C.** amputations.

B. lacerations. **D.** punctures.

_____ **6.** Care for an abrasion is important because of the:

A. amount of blood and fluid lost. **C.** underlying soft tissue damage.

B. emotional trauma of the patient. **D.** risk of contamination and infection.

_____ **7.** In treating a patient with a puncture wound involving an impaled object, take all the following steps EXCEPT:

A. removing the impaled object. **C.** controlling profuse bleeding.

B. exposing the wound area. **D.** keeping the patient at rest.

_____ **8.** A major concern in caring for a patient with an impaled object in the cheek is:

A. dressing the wound. **C.** checking to see if the tongue is cut.

B. maintaining an open airway. **D.** positioning the head for drainage.

_____ **9.** Absence of pain in a patient with a burn is most commonly associated with a:

A. superficial burn. **C.** full thickness burn.

B. partial thickness burn. **D.** cyanotic burn.

_____ **10.** In managing a burn correctly, an EMT may take all the following steps EXCEPT:

A. applying dry, sterile dressings. **C.** keeping the patient warm.

B. applying ointments or sprays. **D.** keeping the burn site clean.

_____ **11.** A blast injury that results in a toxic exposure is a(n):

A. quaternary injury. **C.** primary injury.

B. secondary injury. **D.** tertiary injury.

_____ **12.** A high-pressure injection injury to the hand is of particular concern to the EMT because:

A. it is life-threatening. **C.** the hand is burned.

B. the entire limb may be affected. **D.** it is a blast injury.

_____ **13.** In cases of amputation, save the amputated part by:

A. wrapping it in wet dressings.

B.covering it with ice and putting it in a plastic bag.

C.wrapping it in aluminum foil and keeping it at room temperature.

D.putting it in a plastic bag, then into a pan of cool water.

_____ **14.** In cases of chemical burns to the eyes, you should flood the eyes with:

A. vinegar. **C.** water.

B. baking soda and water. **D.** hydrogen peroxide solution.

_____**15.** The major problem usually associated with electrical shocks is:

A. internal bleeding. **C.** hypothermia.

B. hypertension. **D.** respiratory and/or cardiac arrest.

HANDOUT 26-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

You are dispatched to an apartment complex for an assault victim. The police have secured the scene prior to your arrival. You find a 22-year-old female patient who was involved in a gang-related altercation. She states she was punched several times in the head and had her ear bitten off. She denies any loss of consciousness, and her vital signs are within normal limits. She complains of pain to her ear. She is very angry and upset and is threatening retaliation to her assailants. You notice a large piece of her right outer ear is missing, and it is oozing blood. The police officer was able to locate the missing part of the ear.

1. Does the patient require c-spine precautions? Why or why not?
2. How would you manage the patient's injury to the ear?
3. How would you care for and transport the amputated ear?

HANDOUT 26-3: Reinforcing Content Mastery Student's Name

CHAPTER 26 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. The largest organ in the human body is the _____.

2. The three layers of the skin are the _____, _____, and _____ _____.

3. A(n) _____ _____ is an internal injury in which there is no open pathway from the outside to the injured site.

4. A swelling caused by the collection of blood under the skin as a result of an injured or broken blood vessel is called a(n) _____.

5. _____ are the most common forms of closed wounds encountered by an EMT.

6. A(n) _____ _____ is an injury in which the skin is interrupted, or broken, exposing the tissues underneath.

7. Simple scrapes or scratches in the outer layer of the skin are known as _____.

8. A puncture wound that has both an entrance wound and an exit wound is known as a(n) _____ puncture wound.

9. _____ are wounds in which flaps of skin and tissues are torn loose or pulled off completely.

10. A(n) _____ _____ _____, or third-degree burn, is a burn in which all layers of the

skin are damaged.

11. A way of estimating the extent of a burn through use of the patient's hand is called the _____ _____ _____.

12. All burns normally classified as moderate should be reclassified as _____ in a person less than 5 or more than 55 years of age.

13. If dry lime is the burn agent, do not wash the burn with _____.

14. Any material applied to a wound in an effort to control bleeding and prevent further contamination is known as a(n) _____.

15. It is important to maintain the dignity of patients who have soft tissue injuries to their _____ .

HANDOUT 26-4: Reinforcing Content Mastery Student's Name

SOFT-TISSUE TRAUMA LISTING

Complete the following lists.

1. List the eight soft tissues of the body.

_____

_____

_____

_____

_____

_____

_____

_____

2. List five functions of the skin.

_____

_____

_____

_____

_____

3. List the six basic emergency care steps in treating closed wounds.

_____

_____

_____

_____

_____

_____

4. List the eight basic emergency care steps in treating open wounds.

_____

_____

_____

_____

_____

_____

_____

_____

HANDOUT 26-5: Reinforcing Content Mastery Student's Name

THE RULE OF NINES

The rule of nines is used to estimate the extent of the burn area on a patient's body. On the figures below, write in the percentage that each body area represents on the lines provided.

THE RULE OF NINES

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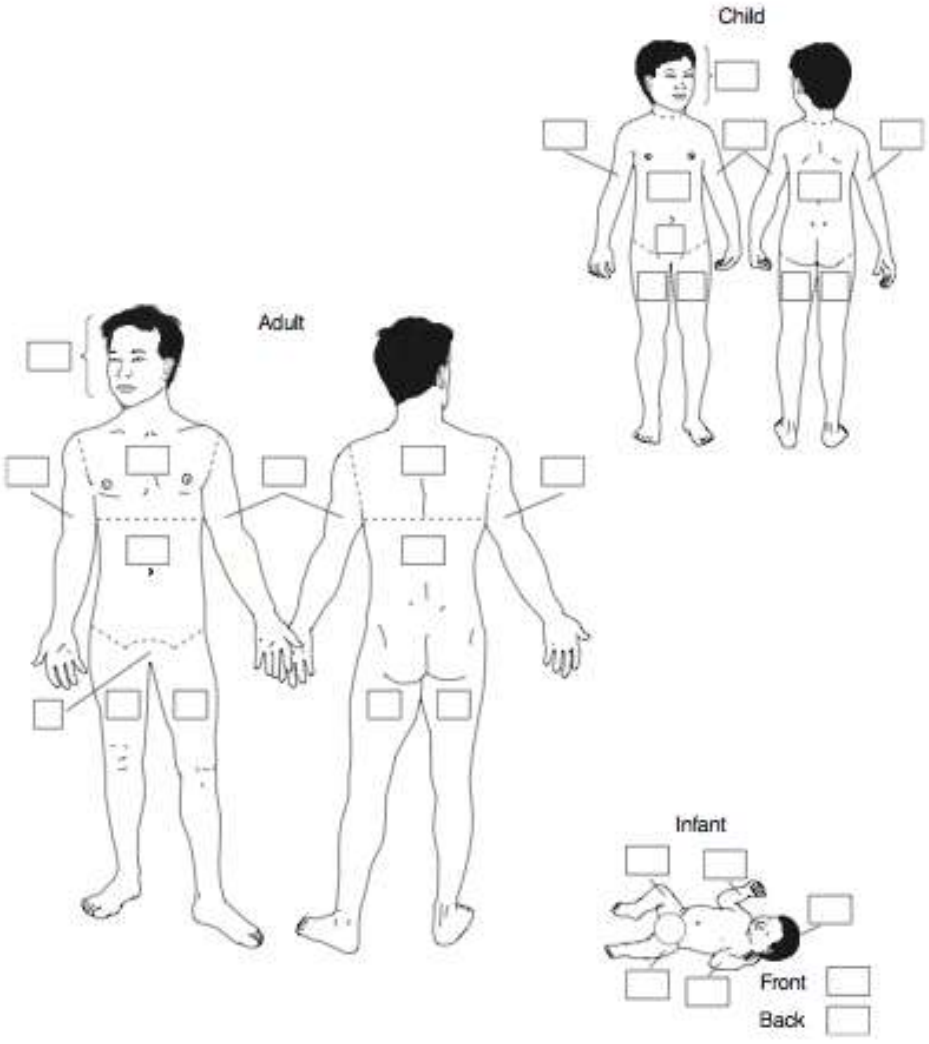


Chapter 26 Answer Key

HANDOUT 26-1: Chapter 26 Quiz

1. D

2. D

3. C

4. D

5. A

6. D

7. A

8. B

9. C

10. B

11. A

12. B

13. D

14. C

15. D

HANDOUT 26-2: In the Field

1.The decision to utilize c-spine precautions in this situation is a controversial one among the trauma community. An argument can be made equally for or against c-spine precautions. Reasons for c-spine precautions include the fact the patient suffered trauma to the head and may have a spinal injury. Reasons against c-spine precautions include no loss of conscious-

ness, no neck pain, increased scene time required, and potential worse outcome. The EMT should base his decision to use c-spine precautions on the mechanism or injury and the local protocols established by the Medical Director.

2.The EMT should control bleeding of the affected ear and apply a bandage if necessary.

3.The amputated ear should be wrapped in a sterile dressing. The ear should be placed in a plastic bag and put in a pan with water kept cool with ice or cold packs. The ear should not be immersed directly in water or saline. It should not come into direct contact with ice, as it may freeze.

HANDOUT 26-3: Chapter 26 Review

1. skin

2.epidermis; dermis; subcutaneous layers

3.closed wound

4.hematoma

5.Contusions

6.open wound

7.abrasions

8.perforating

9.Avulsions

10.full thickness burn

11.rule of palm

12.critical

13. water

14.dressing

15.genitalia

HANDOUT 26-4: Soft-Tissue Trauma Listing

1.Skin; Fatty tissues; Muscles; Blood vessels; Fibrous tissues; Membranes; Glands; Nerves

2.Protection; Water balance; Temperature regulation; Excretion; Shock absorption

3.Take Standard Precautions. Manage the patient's airway, breathing, and circulation. Manage as if there is internal bleeding, and care for shock. Splint extremities that are painful, swollen, or deformed. Stay alert for the patient to vomit. Continue to monitor the patient for development of shock, and transport as soon as possible.

4.Expose the wound. Clean the wound surface. Control bleeding. Care for shock. Prevent further contamination. Bandage the dressing in place after bleeding has been controlled. Keep the patient lying still. Reassure the patient.

HANDOUT 26-5: The Rule of Nines

Adult: Head, 9; upper chest, 9; abdomen, 9; anterior upper extremities, 4½ each; anterior lower extremities, 9 each; genitals, 1; upper back, 9; lower back and buttocks, 9; posterior upper extremities, 4½ each; posterior lower extremities, 9 each

Child: Head, 18; chest and abdomen, 18; anterior upper extremities, 4½ each; anterior lower extremities, 7 each; genitals, 1; entire back and buttocks, 18; posterior upper extremities, 4½ each; posterior lower extremities, 7 each

Infant: Head, 18; front, 18; back, 18; arms, 9 each; legs, 14 each; genitals, 1

CHAPTER 27

Chest and Abdominal Trauma

HANDOUT 27-1: Evaluating Content Mastery Student's Name

EVALUATION

CHAPTER 27 QUIZ

Write the letter of the best answer in the space provided.

_____ **1.** A chest injury where the skin is not broken is called a(n):

A. penetrating injury. **C.** open injury.

B. critical injury. **D.** closed injury.

_____ **2.** A type of closed injury in which two or more consecutive ribs are fractured in two or more places is called:

A. commotio cordis. **C.** tension pneumothorax.

B. cutaneous layer. **D.** flail chest.

_____ **3.** Blunt trauma to the chest that results in a patient's going into ventricular fibrillation is called:

A. intercostal spasm. **C.** commotio cordis.

B. cardiac tamponade. **D.** hemothorax.

_____ **4.** An injury to the heart that causes blood to flow into the sac lining the heart is called:

A. myocardial contusion. **C.** endocarditis.

B. pericarditis. **D.** pericardial tamponade.

_____ **5.** Patients with an aortic dissection will often complain of a tearing sensation in their:

A. back. **C.** arm.

B. chest. **D.** leg.

_____ **6.**The medical term used to describe a chest wound that is open to the atmosphere is:

A. flail chest. **C.** sucking chest wound.

B. paradoxical wound. **D.** air embolism.

_____ **7.**The condition in which the chest cavity fills with blood is known as:

A. pneumothorax. **C.** traumatic asphyxia.

B. hemothorax. **D.** tension pneumothorax.

_____ **8.**Open wounds of the abdomen so large that organs protrude from them are known as:

A. avulsions. **C.** eviscerations.

B. sucking abdominal wounds. **D.** hematomas.

_____ **9.**The medical term for any dressing that forms an airtight seal is a(n):

A. occlusive dressing. **C.** universal dressing.

B. flutter-valve dressing. **D.** self-adherent dressing.

_____ **10.** The preferred position in which to place patients with abdominal injuries is:

A.on the back with legs flexed at the knees. **C.** prone.

B. the Trendelenburg position. **D.** the Fowler's position.

HANDOUT 27-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

A call comes into your station from the emergency medical dispatcher. "Head-on collision on Ludlow Street. Four people involved."

Your unit reaches the scene in two minutes. Police have already closed off the one-way street. "Out-of-town driver," says the police officer. "He completely missed the one-way sign."

You quickly size up the scene and notice skid marks near one of the vehicles. "I tried to hit my brakes when I saw him coming," says the driver of the other car. "I wasn't going all that fast when we collided, but it was still quite a jolt."

The occupants of both cars were wearing seat belts. Airbags went off when the vehicles ran into each other. One front-seat passenger, a 19-year-old male, is complaining of abdominal and chest pain. Upon initial assessment, you find marks across his body where the seat belt confined him. As you palpate these areas, the patient complains of tenderness. You note that his abdomen is rigid and that he winces as you attempt to palpate it. There appear to be no other injuries to his body, so you place him on a stretcher with his knees flexed.

1. What type of injury do you suspect that the patient has suffered?

   What was the mechanism of injury?

2. What other care steps would you provide for this patient? Why?

While you are assessing the patient, he becomes pale and less talkative. His pulse and respiratory rates have increased since you took the set of baseline vital signs.

3. What do you think is happening to the patient? What actions should you

take?

HANDOUT 27-3: Reinforcing Content Mastery Student's Name

CHAPTER 27 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. The fracture of two or more ribs in two or more places is called a _____ _____.

2. A wound where blood enters into the chest cavity is called a _____.

3. A(n) _____ _____ is an internal injury in which there is no open pathway from the outside to the injured site.

4. Movement of ribs in a flail segment in the opposite direction of the chest wall is called _____ _____.

5. _____ _____ should be placed on eviscerations to prevent drying out of internal organs.

6. A(n) _____ _____ is a pneumothorax in which the air is now pushing against the vena cava and trachea, blocking blood flow and ultimately causing death.

7. Blunt trauma to the chest that can cause the patient to go into sudden ventricular fibrillation is called _____ _____.

8. The term _____ _____ _____ is used when the chest cavity is open to the atmosphere.

9. _____ occurs when the lung collapses as a result of air that has entered the chest cavity.

10. Open wounds so deep that organs protrude from them are known as

_____.

HANDOUT 27-4: Reinforcing Content Mastery Student's Name

CHEST AND ADOMINAL TRAUMA LISTING

Complete the following lists.

1. List nine types of chest injuries.

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. List the eight steps for treating closed and open abdominal injuries.

_____

_____

_____

_____

_____

_____

_____

HANDOUT 27-5: Reinforcing Content Mastery Student's Name

IDENTIFYING SOFT-TISSUE INJURIES

For each of the signs listed in the left-hand column below, write the type of injury that might be indicated by it in the right-hand column.

Signs	**Possible Injury Indicated**
Large bruise or bruised areas directly over body organs such as the spleen, liver, or kidneys	**1.**
Tearing back pain	**2.**
Absent lung sounds on the left side	**3.**
Paradoxical movement	**4.**
Swollen or rigid abdomen	**5.**

Chapter 27 Answer Key

HANDOUT 27-1: Chapter 27 Quiz

1. D

2. D

3. C

4. D

5. A

6. C

7. B

8. C

9. A

10. A

HANDOUT 27-2: In the Field

1.The injury is a closed, blunt trauma. The mechanism of injury is the force of the restraining seat belt against the patient's abdomen and chest. The force can be transmitted from the exterior body surface to interior structures, even though the only visible injury may be a simple bruise.

2.Manage the patient as if there is internal bleeding, and provide treatment to care for and prevent shock. Provide high-concentration oxygen. (If there is internal bleeding or a rupture of any organs, the patient will need to have his blood saturated with oxygen.) Monitor vital signs so you can compare them with the set of baseline vitals. Be alert for vomiting, and transport as quickly as possible.

3.The patient is apparently developing shock, probably due to internal bleeding. Transport rapidly.

HANDOUT 27-3: Chapter 27 Review

1.flail chest

2.hemothorax

3.closed injury

4.paradoxical movement

5.Moist dressings

6.tension pneumothorax

7.commotio cordis

8.sucking chest wound

9.Pneumothorax

10.eviscerations

HANDOUT 27-4: Soft-Tissue Injuries Listing

1.Sucking chest wound; Flail chest; Pneumothorax; Tension pneumothorax; Hemothorax; Commotio cordis; Traumatic asphyxiation; Cardiac tamponade; Aortic dissection

2.Stay alert for vomiting, and keep the airway open; Place the patient on his back with knees flexed; Administer high-concentration oxygen; Care for shock; Use PASG per local protocol; Give nothing to the patient by mouth; Monitor vital signs; Transport as soon as possible

HANDOUT 27-5: Identifying Soft-Tissue Injuries

1.Possible injury to underlying organs

2.Possible aortic aneurism

3.Possible pneumothorax or hemothorax

4.Flail chest

5.Possible internal bleeding

CHAPTER 28

Musculoskeletal Trauma

HANDOUT 28-1: Evaluating Content Mastery Student's Name

EVALUATION

CHAPTER 28 QUIZ

Write the letter of the best answer in the space provided.

_____ **1.** All the following are part of the musculoskeletal system EXCEPT:

A. bones. **C.** cartilage.

B. joints. **D.** skin.

_____ **2.** The bones found in the arm and thigh are examples of:

A. long bones. **C.** flat bones.

B. short bones. **D.** irregular bones.

_____ **3.** The major short bones of the body are found in the:

A. neck. **C.** hands and feet.

B. shoulder blades. **D.** ribs.

_____ **4.** The strong, white, fibrous membrane that covers bones and through which blood vessels and nerves pass is called the:

A. calcium. **C.** periosteum.

B. protein. **D.** cartilage.

_____ **5.** Tissues or fibers that cause movement of the body parts or organs are called:

A. periosteum. **C.** cartilage.

B. muscles. **D.** tendons.

_____ **6.** The mechanism that causes the crushed tissues and fractures found in a patient struck by an auto is:

A. direct force. **C.** twisting force.

B. indirect force. **D.** rotational force.

_____ **7.** Bones broken in several places are classified as:

A. angulated. **C.** greenstick.

B. comminuted. **D.** dislocated.

_____ **8.** An injury to a joint in which the bone ends become separated from each other is called a(n):

A. dislocation. **C.** sprain.

B. angulation. **D.** fracture.

_____ **9.** The splints that are most commonly used to immobilize joint injuries in the position found are:

A. rigid splints. **C.** formable splints.

B. vacuum splints. **D.** traction splints.

_____ **10.** After taking Standard Precautions, exposing the area, and controlling any external bleeding, the next step in immobilizing a long-bone fracture is:

A. assessing distal PMS. **C.** measuring the splint.

B. applying manual stabilization. **D.** applying the splint.

_____ **11.** If a patient's injured leg appears shorter than the other, an EMT

should suspect:

A. patella injury. **C.** fibula injury.

B. ankle dislocation. **D.** hip fracture.

_____ **12.** All the following are care steps in treating an ankle or a foot injury EXCEPT:

A. applying manual traction. **C.** placing a pillow under the ankle.

B. assessing distal PMS function. **D.** caring for shock.

_____ **13.** The splint best suited for stabilization of a dislocated shoulder is a(n):

A. air-inflatable splint. **C.** traction splint.

B. sling and swath. **D.** rigid splint.

_____ **14.** The splint best suited for easing pain of muscle spasm associated with fractures of the femur is a(n):

A. air-inflatable splint. **C.** vacuum splint.

B. traction splint. **D.** PASG.

_____ **15.** Muscle injuries resulting from overstretching or overexertion of the muscle are called:

A. sprains. **C.** dislocations.

B. strains. **D.** sublocations.

HANDOUT 28-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

Your unit responds to a 911 call by a mother who reports that her 11-year-old son "has fallen from his tree house." When you arrive on the scene, the mother takes you into the backyard, where you see the boy grimacing in pain. He is holding his right leg. "It hurts all the way down to my toes," says the boy.

You introduce yourself and find out that the boy's name is Timmy. His friend Richie breaks into the conversation. "We were carrying stuff into the tree house, and Timmy fell off the ladder." You see wooden rungs nailed to the tree trunk, and ask Richie to indicate where Timmy slipped. Richie indicates a rung about eight feet off the ground. You ask Timmy if he remembers how he landed. "I think I hit my feet first," he says. "It hurt so much that I couldn't stand."

1. What mechanism caused Timmy's injuries?
2. What bones or joints do you suspect have been injured?
3. What type of splint will you use to immobilize Timmy? Why?
4. What factors must you take into account because of Timmy's age?

HANDOUT 28-3: Reinforcing Content Mastery Student's Name

CHAPTER 28 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. The _____ _____ is composed of all the bones, joints, and muscles of the body.

2. As components of the skeleton, bones provide the body's _____.

3. _____ are the places where bones articulate and are a critical element in the body's ability to move.

4. The most common type of bone injury is a break, or _____.

5. Both the swelling and clotting associated with broken bones is due to the destruction of blood vessels in the _____.

6. _____ are bands of connective tissue that bind the muscles to the bones.

7. The three types of mechanisms that cause musculoskeletal injuries are _____ force, _____ force, and _____ force.

8. The _____ _____ applies constant pull along the length of the femur to stabilize fractures and reduce muscle spasms.

9. The three classifications of bone fractures are _____, _____, and _____.

10. Proper _____ and prehospital care of musculoskeletal injuries help prevent closed injuries from becoming _____ injuries.

11. Blood at the meatus (opening) of the penis is a sign of _____ trauma.

12. The memory aid CSM stands for _____, _____, and

_____ _____.

13. Dramatic-looking or painful extremity injuries can sometimes distract an EMT from looking for other _____-_____ conditions.

14. For any splint to be effective, it must immobilize _____ _____ and _____ _____.

15. The object of realignment of deformed extremities is to assist in restoring effective _____.

16. A traction splint is contraindicated if there is a(n) _____, _____, or _____ injury.

17. A patient with a hip fracture should be managed for _____ and receive oxygen at high concentration.

18. Studies of mechanisms of injury indicate that infants and children with fractured femurs often have injury to _____ _____.

19. _____ and _____ are the most common musculoskeletal injuries to the ankle and the foot.

20. A triangular bandage used to support the shoulder and arm is called a(n) _____.

HANDOUT 28-4: Reinforcing Content Mastery Student's Name

REINFORCEMENT

MUSCULOSKELETAL INJURIES LISTING

Complete the following lists.

1. List the six components of the musculoskeletal system.

_____

_____

_____

_____

_____

_____

2. List four types of musculoskeletal injuries.

_____

_____

_____

_____

3. List three types of mechanisms that cause musculoskeletal injury.

_____

_____

_____

4. List at least six signs or symptoms of musculoskeletal injuries.

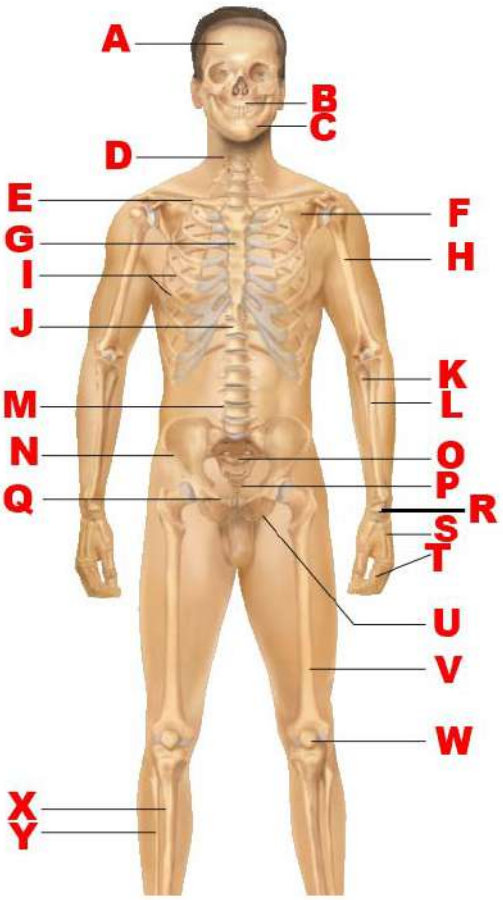
_____

_____

Handout 28-5: Reinforcing Content Mastery Student's Name

IDENTIFYING MAJOR BONES

Write the letter indicating where the bone is located in the space provided next to the name of the bone.



_____ **1.**Ilium

_____ **2.**Femur

_____ **3.**Lumbar spine

_____ **4.**Ulna

_____ **5.**Clavicle

_____ **6.**Fibula

_____ **7.**Sternum

_____ **8.**Scapula

_____ **9.**Radius

_____ **10.** Tibia

_____ **11.** Cervical spine

_____ **12.** Humerus

Chapter 28 Answer Key

HANDOUT 28-1: Chapter 28 Quiz

1.	D	**4.**	C	**7.**	B	**10.**	B	**13.**	B
2.	A	**5.**	B	**8.**	A	**11.**	D	**14.**	
3.	C	**6.**	A	**9.**	C	**12.**	A	**15.**	

HANDOUT 28-2: In the Field

1.Timmy's injuries were caused by both direct force and indirect force; the impact of the fall is transmitted along the bone shafts and damages bones farther up the extremity.

2.The bones and joints that could be injured include bones and joints of the feet and ankle (by direct force); bones of the tibia, fibula, and femur; and joints of the knee, hip, and pelvis (by indirect force).

3.Because the injury could involve the entire leg from hip to toes, the injury can be treated as a pelvic fracture. The boy can be secured on a long spine board with his legs stabilized by a folded blanket between them and secured with cravats. This will splint him rapidly and take care of all injuries at one time.

4.In children the growth plate may be damaged if the fractured limb is not carefully managed.

HANDOUT 28-3: Chapter 28 Review

1.musculoskeletal system

2.framework

3. Joints

4.fracture

5.periosteum

6.Tendons

7.direct; indirect; twisting

8.traction splint

9.comminuted; angulated; greenstick

10.splinting; open

11.pelvic

12.circulation, sensation, motor function

13.life-threatening

14.adjacent joints; bone ends

15.circulation

16.pelvis; hip; knee

17. shock

18.internal organs

19. Sprains; fractures

20. sling

HANDOUT 28-4: Musculoskeletal Injuries Listing

1.Bones; Joints; Muscles of the body; Cartilage; Tendons; Ligaments

2.Fracture; Dislocation; Sprain; Strain

3.Direct force; Indirect force; Twisting force

4.Pain and tenderness; Deformity or angulation; Grating, or crepitus; Swelling; Bruising; Exposed bone ends; Joints locked into position; Nerve and blood-vessel compromise

HANDOUT 28-5: Identifying Major Bones

1.	N	**4.**	K	**7.**	G	**10.**	X
2.	V	**5.**	E	**8.**	F	**11.**	
3.	M	**6.**	Y	**9.**	L	**12.**	

CHAPTER 29

Trauma to the Head, Neck, and Spine

HANDOUT 29-1: Evaluating Content Mastery Student's Name

EVALUATION

CHAPTER 29 QUIZ

Write the letter of the best answer in the space provided.

_____ **1.** The major components of the central nervous system include the brain and the:

A. cranium. **C.** spinal cord.

B. spinous process. **D.** dura mater.

_____ **2.** The part of the nervous system that detects sensations such as pain is the:

A. peripheral nervous system. **C.** central nervous system.

B. autonomic nervous system. **D.** involuntary nervous system.

_____ **3.** The part of the nervous system that controls involuntary functions such as heartbeat and breathing is the:

A. peripheral nervous system. **C.** central nervous system.

B. autonomic nervous system. **D.** involuntary nervous system.

_____ **4.** The facial bone that is not fused into immovable joints is the:

A. mandible. **C.** temporal bone.

B. malar. **D.** maxillae.

_____ **5.** The sign an EMT would most expect to find with a scalp injury is:

A. discoloration around the eyes. **C.** cerebrospinal fluid from the nose.

B. bleeding from the ears. **D.** profuse bleeding from the head.

_____ **6.** After taking Standard Precautions, the first care step in treating skull fractures and brain injuries is to:

A. apply a rigid collar. **C.** provide manual stabilization of the head.

B. control bleeding. **D.** transport the patient immediately.

_____ **7.** A collection of blood within the skull or brain tissue is called a:

A. hematoma. **C.** concussion.

B. contusion. **D.** laceration.

_____ **8.** The spinal regions most susceptible to injury are the:

A. cervical and lumbar. **C.** cervical and sacral.

B. thoracic and sacral. **D.** thoracic and lumbar.

_____ **9.** Probably the most common and reliable sign of spinal cord injury in conscious patients is:

A. Battle's sign. **C.** raccoon's eyes.

B. pupil dilation. **D.** paralysis of the extremities.

_____ **10.** In the normal extrication of a patient, the device that an EMT would apply first is the:

A. cervical collar. **C.** Kendrick Extrication Device.

B. short spine board. **D.** long spine board.

_____ **11.** Posturing is a clinical sign of:

A. concussion. **C.** herniation.

B. basal skull fracture. **D.** spinal cord injury.

_____ **12.** When applying a short spine board or flexible extrication device, you should first secure the:

A. torso. **C.** shoulders.

B. chest. **D.** head.

_____ **13.** The move used with a patient when applying the long backboard is the:

A. direct ground lift. **C.** firefighter's lift.

B. extremity lift. **D.** log roll.

_____ **14.** In documenting a possible head or spine injury, it is critical to note whether the patient, even briefly, lost:

A. his breath. **C.** his balance.

B. consciousness. **D.** capillary refill.

_____ **15.** Which of the following is NOT an indication for removing a helmet in a case of suspected head or spine injury?

A. The helmet interferes with assessment of the ABCs.

B. The helmet fits snugly.

C. The patient goes into cardiac arrest.

D. The helmet fits loosely.

HANDOUT 29-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

Your crew is called to an accident at a backyard pool party. Upon arrival at the site, you do a quick scene size-up. You notice a group of about ten people in swimming suits, some with drinks. The patient, a 22-year-old male, is sitting on the edge of the pool. He appears to be using his arms to brace himself.

A bystander tells you, "Paul fell into the shallow end of the pool. When he pulled himself out of the water, he was holding his head. He started complaining that his neck hurt, then said he had a headache. Then he sat next to the pool and hasn't moved since."

As you begin rapid trauma assessment, you note that Paul is conscious. However, he does not respond to your questions.

1. What is your general impression of the mechanism of the patient's injury?

2. What additional questions would you ask bystanders?

3. What device would you use for transporting the patient?

4. What continuing care steps would you provide for this patient?

HANDOUT 29-3: Reinforcing Content Mastery Student's Name

CHAPTER 29 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. The major components of the _____ _____ are the brain and the spinal cord.

2. The nervous system is divided into two subsystems: the _____ _____ _____ and the _____ _____ _____.

3. The _____ is the master organ of life.

4. The _____ is the portion of the skull that encloses the brain.

5. The brain is bathed in a substance called _____ _____.

6. The scalp has many _____ _____, so any scalp injury may bleed profusely.

7. With head injuries, the words *open* and *closed* refer to the _____ _____.

8. In a(n) _____ _____ _____, the brain is lacerated, punctured, or bruised by broken bones or by foreign objects.

9. In a(n) _____ _____ _____, the shock or impact on the skull is transferred to the brain.

10. _____ from blood loss is generally not a sign of head injury, except in infants.

11. A bruised brain, or _____, occurs when the force of a blow is great enough to rupture blood vessels.

12. In addition to APVU, some EMS systems use the _____ _____ _____ for ongoing neurological assessment.

13. The primary concern with facial fractures is the patient's _____.

14. An EMT should "_____," or overtreat, patients with potential spinal injuries.

15. Assume that any fall at least _____ times the patient's height will also be accompanied by a spinal injury.

16. Assume that all unconscious trauma patients will have _____ _____.

17. In a rapid trauma exam, an EMT should assess the head and neck, then apply a(n) _____ _____ _____.

18. An EMT will need to _____ _____ a patient to apply the long backboard.

19. Whenever an EMT sees a spider-web-cracked windshield, she knows that the driver needs full _____ _____.

20. In documenting injuries to the head and spine, carefully note any changes in the patient's _____ _____ throughout assessment, treatment, and transport.

HANDOUT 29-4: Reinforcing Content Mastery Student's Name

TRAUMA TO THE HEAD, NECK, AND SPINE LISTING

Complete the following lists.

1. List three types of brain injuries.

_____

_____

_____

2. List the four signs or symptoms that are reliable indicators of possible spinal injury in the conscious patient.

_____

_____

_____

_____

3. List five assessment strategies for suspected spinal injuries in a responsive patient.

_____

_____

_____

_____

_____

4. List three assessment strategies for suspected spinal injuries in an unresponsive patient.

_____

HANDOUT 29-5: Reinforcing Content Mastery Student's Name

REINFORCEMENT

HEAD, NECK, AND SPINE MATCHING

Write the letter of the term in the space provided next to the appropriate description.

A. Autonomic nervous system

B.Central nervous system

C. Cerebrospinal fluid

D. Concussion

E.Contusion

F.Cranium

G. Hematoma

H. Malar

I. Mandible

J. Maxillae

K. Nervous system

L.Orbits

M. Peripheral nervous system

N. Spinous process

O. Vertebrae

_____ **1.** Bony structures around the eyes; eye sockets

_____ **2.** Two fused bones forming the upper jaw

_____ **3.** Bony structure making up the forehead, top, back, and upper sides of the skull

_____ **4.** Controls involuntary functions

_____ **5.** Mild closed head injury without detectable damage to the brain

_____ **6.** Collection of blood within the skull or brain

_____ **7.** Bones of the spinal column

_____ **8.** Nerves that enter and exit the spinal cord between the vertebrae and the 12 pairs of cranial nerves, and all of the body's other motor and sensory nerves

_____ **9.** Bony bump on a vertebra

_____ **10.** Cheekbone, also called the zygomatic bone

_____ **11.** Bruised brain caused by a blow great enough to rupture blood vessels

_____ **12.** Brain and spinal cord

_____ **13.** Controls thought, sensation, and the voluntary and involuntary motor functions

_____ **14.** Fluid that surrounds the brain and spinal cord

_____ **15.** Lower jawbone

HANDOUT 29-6: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IMMOBILIZATION REVIEW

Review your knowledge of immobilization techniques by putting the steps of the procedures below in proper order. With each procedure, write a "1" in the space provided next to the step you would perform first, a "2" next to the step you would perform next, and so on.

A. Spinal Immobilization of a Supine Patient

_____ Immobilize patient's torso to the board.

_____ Move patient onto device without compromising integrity of spine.

_____ Pad and immobilize patient's head.

_____ Secure torso straps.

_____ Reassess distal CSM.

_____ Apply appropriately sized cervical collar.

_____ Secure patient's legs to board.

_____ Place head in neutral in-line position and maintain manual stabilization; assess distal CSM.

_____ Position immobilization device.

B. Spinal Immobilization of a Seated Patient

_____ Evaluate and pad behind patient's head as necessary. Secure patient's head to device.

_____ Apply appropriately sized extrication collar.

_____ Evaluate and adjust straps.

_____ Reassess distal CSM.

_____ Manually stabilize patient’s head in neutral in-line position.

_____ Position immobilization device behind patient.

_____ As needed, secure patient’s wrists and legs.

_____ Assess distal CSM.

_____ Secure device to patient’s torso.

Chapter 29 Answer Key

HANDOUT 29-1: Chapter 29 Quiz

1. C

2. A

3. B

4. A

5. D

6. C

7. A

8. A

9. D

10.A

11.C

12.A

13.D

14.B

15.B

HANDOUT 29-2: In the Field

1. The patient probably struck his head on the bottom of the pool.

2. Sample questions: What was he doing just prior to his fall? Was there any horseplay, or did he trip? Had he been drinking? Does anyone know if he is on medications or if there are any prior medical conditions?

3. You would use a long spine board to transport the patient.

4. Continuing care steps include these: Perform a detailed assessment; continue an ongoing assessment en route to the hospital (e.g., monitor vital signs, provide high-concentration oxygen, get additional history if possible).

HANDOUT 29-3: Chapter 29 Review

1. nervous system
2. central nervous system; peripheral nervous system
3. brain
4. cranium
5. cerebrospinal fluid
6. blood vessels
7. cranial bones
8. open head injury
9. closed head injury
10. Shock
11. contusion
12. Glasgow Coma Scale
13. airway
14. uptriage
15. three
16. spinal injury
17. rigid cervical collar
18. log roll
19. spinal immobilization

20. mental status

HANDOUT 29-4: Trauma to the Head, Neck, and Spine Listing

1. Concussion; Contusion; Hematoma

2. Paralysis of the extremities; Pain without movement; Pain with movement; Tenderness anywhere along the spine

3. Ascertain the mechanism of injury. Ask these questions: (1) What happened? (2) Where does it hurt? Does your neck or back hurt? (3) Can you move your hands or feet? (4) Can you feel me touching your fingers? Your toes? (5) Do you feel "pins and needles" in your legs? Anywhere? Inspect for contusions, deformities, lacerations, punctures, penetrations, swelling. Palpate for tenderness or deformity. Assess equality of strength in the extremities by checking hand grip or pushing against the patient's hands and feet.

4. Ascertain from bystanders the mechanism of injury and information about the patient's mental status prior to your arrival. Inspect for contusions, deformities, lacerations, punctures, penetrations, swelling. Palpate for area of tenderness (some unresponsive patients will still withdraw from pain) or deformity.

HANDOUT 29-5: Head, Neck, and Spine Matching

1. L

2. J

3. F

4. A

5. D

6. G

7. O

8. M

9. N

10. H

11. E

12. B

13. K

14. C

15. I

HANDOUT 29-6: Immobilization Review

The order of steps reading down in each column should be:

A. 5, 4, 8, 6, 9, 2, 7, 1, 3

B. 6, 3, 7, 9, 1, 4, 8, 2, 5

CHAPTER 30

Multisystem Trauma

Handout 30-1: Evaluating Content Mastery Student's Name

EVALUATION

CHAPTER 30 QUIZ

Write the letter of the best answer in the space provided.

_____ **1.** All of the following are one of the three "Ts" of managing a multiple-trauma patient EXCEPT:

A. teamwork. **C.** timing.

B. triage. **D.** transport.

_____ **2.** Which of the following should usually be accomplished on the scene and prior to the transport of most critical multiple-trauma patients?

A. Splinting **C.** Administering high-concentration oxygen

B. Gathering a SAMPLE history **D.** Performing a focused assessment

_____ **3.** Which of the following is the *first* priority for EMTs responding to calls involving multiple-trauma patients?

A. Scene safety **C.** Breathing assessment

B. Airway control **D.** In-line spinal immobilization

_____ **4.** In most areas the appropriate transport decision for an EMT with a critical multiple-trauma patient is:

A. transport to a community hospital.

B. transport to the closest hospital (regardless of the level of care).

C. to wait for ALS, if available, to arrive on scene.

D. transport to a trauma center.

_____ **5.** All of the following are usually immediate threats to a multiple-trauma patient EXCEPT:

A. a blocked airway.

B. a fractured tibia and fibula.

C. shallow and labored breathing.

D. an open chest wound.

Handout 30-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

You respond to a call that involves a stabbing at a bar notorious for fights. The dispatcher indicates that only one patient has been reported injured and that the police are en route to the scene. As your partner heads downtown, you realize that your response time will be less than three minutes.

1. What concerns do you have about scene safety? What Standard Precautions run through your mind?

After the scene has been secured, you enter the bar and observe a male patient in his early 20s. He is lying on his back in a pool of blood.

2. How should you assess this patient?

The patient is responsive to painful stimuli only, his airway is patent, and his respirations are shallow and rapid. You find his pulse to be rapid and thready. You observe that the significant venous bleeding is coming from the patient's abdomen. Bystanders report that the assailant stabbed the patient once, then fled the scene with a "big knife." Based on this information, you suspect that the patient may have cervical spine injury. You consider him to be unstable and a high priority.

3. What on-scene interventions do you provide?
4. What care should be done during transport to the hospital?
5. To what kind of hospital should this patient be taken?

Handout 30-3: Reinforcing Content Mastery Student's Name

CHAPTER 30 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. The _____-_____ patient has more than one serious injury.

2. Integrating the three "Ts," _____, _____, and _____into your management of a critical trauma patient will help things go smoother and more efficiently for the patient.

3. Prepare for a call for a multiple-trauma patient by _____ for it.

4. In managing a multiple-trauma patient, balance the patient's need for _____ transport against the _____ need to perform patient care at the scene.

5. A critical concept is to get the multisystem trauma patient to the appropriate facility _____ _____ _____ _____.

6. _____ _____ is paramount in multiple-trauma management.

7. Different kinds of traumas tend to have different kinds of _____.

8. If you are unable to ventilate your patient without assistance, try

_____ _____ until you find one that works.

9. A key principle of multiple-trauma management is to perform urgent or emergency moves _____ _____.

10. Above all else, you must _____ to the situation.

Handout 30-4: Reinforcing Content Mastery Student's Name

MULTISYSTEM TRAUMA LISTING

Complete the following lists.

1. List the three "Ts" integrated into the management of the multiple-trauma patient.

_____

_____

_____

2. List the seven limited scene treatments that an EMT may perform when dealing with critical multiple-trauma patients.

_____

_____

_____

_____

_____

_____

_____

3. List four principles of multiple-trauma management.

_____

_____

_____

_____

4. List the three areas of consideration for trauma triage and transport to trauma centers according to the Centers for Disease Control (CDC).

_____

_____

_____

Chapter 30 Answer Key

HANDOUT 30-1: Chapter 30 Quiz

1. B

2. C

3. A

4. D

5. B

HANDOUT 30-2: In the Field

1.The EMTs should not attempt to approach the patient until the police have secured the scene. The perpetrator of the stabbing may still be in the area, the patient may be armed, or further violence may erupt among bystanders. Standard Precautions include gloves and eye protection. If spurting blood is suspected, the EMT should also wear a mask and disposable gown.

2. The EMTs must first perform a primary assessment, identify all life-threatening conditions, and treat them appropriately. The mechanism or injury indicates that a rapid trauma assessment should be performed to ensure all life-threatening injuries are found. The patient is a priority transport. En route, a secondary assessment, including vital signs, detailed assessment, and ongoing assessment, should be performed. A quick attempt at a SAMPLE history may be attempted on-scene but should not delay transport.

3.Immediate bleeding control should take place along with simultaneous control of the airway. Because the patient is responsive to painful stimuli, he will not accept an oropharyngeal airway (OPA) and will require a nasopharyngeal airway (NPA). The patient should be placed on

high-concentration oxygen by bag-valve mask (BVM). Cervical spine precautions should be considered per local protocol. A rapid trauma assessment should be performed with the exposing of the patient to locate any other possible stab wounds or life-threatening injuries. Regardless of local protocol, the use of a long spine board will facilitate the movement of the patient and provide a rigid surface for CPR should the patient go into cardiac arrest. The patient should then be covered with a blanket for shock and rapidly transported to the closest appropriate facility.

4. The secondary assessment should be performed en route. This includes a full set of vital signs and a detailed assessment. Afterward, an ongoing assessment should be performed every five minutes. Depending on local protocols, some students might suggest application of the pneumatic antishock garment (PASG). The EMT should anticipate a deterioration of the patient's condition and be prepared to perform additional interventions as indicated, including doing CPR, inserting an OPA or a combitube, and using the AED. Medical control should be contacted, and further care specified by medical direction should be implemented.

5. This patient requires specialty care that a trauma center provides. The patient should be transported to a trauma center if one is readily accessible by ground or air. (The destination might be determined by criteria established in state, regional, or local protocols.) If one is not available, the patient should be transported to the nearest, most appropriate facility.

HANDOUT 30-3: Chapter 30 Review

1. multiple-trauma

2. teamwork; timing; transport

3. practicing

4. prompt; time

5.as soon as possible

6.Scene safety

7.dangers

8.other approaches

9.as necessary

10. adapt

HANDOUT 30-4: Multisystem Trauma Listing

1.Teamwork; Timing; Transport

2.Suctioning the airway; Inserting an oral or a nasal airway; Restoring a patent airway by sealing a sucking chest wound; Ventilating with a bag-valve mask; Administering high-concentration oxygen; Controlling bleeding; Immobilizing the patient with a cervical collar and a long backboard

3.Scene safety is paramount. Ensure an open airway. Perform urgent or emergency moves as necessary. Adapt to the situation.

4. Physiologic criteria; Anatomic criteria; Mechanism of injury

CHAPTER 31

Environmental Emergencies

HANDOUT 31-1: Evaluating Content Mastery Student's Name

EVALUATION

CHAPTER 31 QUIZ

Write the letter of the best answer in the space provided.

_____ **1.** To rapidly cool a patient with a hyperthermic emergency, apply ice packs to the neck, groin, and:

A. wrists. **C.** knees.

B. axilla or armpits. **D.** ankles.

_____ **2.** Decompression sickness from a dive usually takes place:

A. on surfacing from the dive.

B. from one to 48 hours after the dive.

C. within the first hour after the dive.

D. more than 48 hours after the dive.

_____ **3.** The most important factor in determining whether EMTs enter the water to rescue a patient is:

A. the quality of their equipment. **C.** the depth of the water.

B. their training. **D.** their ability to use a rowboat.

_____ **4.** The LEAST safe method of executing an ice rescue is use of a:

A. flat-bottom aluminum boat. **C.** flotation device and rope.

B. ladder. **D.** human chain.

_____ **5.**The venom produced by a snake or spider is an example of a(n):

A. absorbed poison. **C.** inhaled poison.

B. toxin. **D.** antibody.

_____ **6.**The type of sting or bite that claims the most lives comes from:

A. snakes. **C.** bees and wasps.

B. stingrays. **D.** spiders.

_____ **7.**In addition to a noticeable puncture mark, all of the following are signs and symptoms of snakebite EXCEPT:

A. normal pulse rate. **C.** nausea.

B. seizures. **D.** drowsiness/unconscious.

_____ **8.**All the following are considered pit vipers EXCEPT:

A. rattlesnakes. **C.** coral snakes.

B. copperheads. **D.** water moccasins.

_____ **9.**Water chill, which occurs when clothing or the body gets wet, is an example of:

A. conduction. **C.** radiation.

B. convection. **D.** evaporation.

_____ **10.** Wind chill, which occurs when currents of air pass over the body, is an example of:

A. conduction. **C.** radiation.

B. convection. **D.** evaporation.

_____ **11.** All of the following are signs and symptoms of hypothermia EXCEPT:

A. agitation and hyperactivity. **C.** loss of motor coordination.

B. shivering in early stages. **D.** cool abdominal skin temperature.

_____ **12.** In providing emergency care steps for the hypothermic patient who is alert and responsive, an EMT should:

A. rapidly rewarm the extremities.

B. provide the patient with stimulants.

C. get the patient to walk around.

D. provide care for shock.

_____ **13.** Rough handling of a patient with hypothermia may result in:

A. apnea. **C.** blood clots.

B. ventricular fibrillation. **D.** seizures.

_____ **14.** Superficial local cold injuries are sometimes referred to as:

A. deep cold injuries. **C.** hyperthermia.

B. frostbite. **D.** frostnip.

_____ **15.** All the following are signs and symptoms you might expect to find in a heat emergency patient with hot, dry, or moist skin EXCEPT:

A. rapid, shallow breathing. **C.** dilated pupils.

B. generalized weakness. **D.** heavy perspiration.

HANDOUT 31-2: Reinforcing Content Mastery Student's Name

REINFORCEMENT

IN THE FIELD

Read the following real-life situation. Then answer the questions that follow.

It is an overcast December afternoon when you are dispatched to a call for a woman who has fallen at 45 Standish Street. The temperature is in the 30s, with gusty winds. Banks of dirty snow from last week's storm still line the streets and sidewalks.

1. What might the dispatch call and the weather conditions lead you to expect at this call?

A police car is on the scene when you arrive. The officers assure you that the scene is safe. One officer says he'll lead you to the patient, who has fallen in a snowdrift near the garbage can next to the garage.

2. Given what you know of the situation to this point and given that the police are on the scene, what step might you take to prepare for this patient before leaving the ambulance?

Behind the house, you see a woman apparently in her 60s lying just off an icy set of steps in a snowbank. She is wearing only a housecoat and slippers.

3. What injury possibilities do these circumstances suggest? What actions should you take before proceeding further in your assessment?

As you proceed, you discover that the woman is not alert but does respond inappropriately to loudly spoken questions. She is not shivering, and the skin on her abdomen is cool to the touch. She has a blood pressure of 102/60, a heart rate of 60, and a respiration rate of 14. Her skin is pale, cool, and firm to the touch.

4. What do these findings indicate? How should you proceed?

HANDOUT 31-3: Reinforcing Content Mastery Student's Name

CHAPTER 31 REVIEW

Write the word or words that best complete each sentence in the space provided.

1. Another name for late or deep local cold injuries is _____.

2. A condition in which the body temperature rises above normal is known as _____.

3. The _____ the water in which a near-drowning patient has been submerged, the better the patient's chances for survival.

4. In diving accidents, assume that any unconscious or unresponsive patient has _____ and _____ injuries.

5. A(n) _____ _____ is the result of gases leaving a damaged lung and entering the bloodstream.

6. When a diver comes up too quickly from a deep, prolonged dive, he may experience _____ _____.

7. The _____ _____ _____ was formed to assist rescuers with the care of underwater diving accident patients.

8. The term for a toxin produced by some snakes, spiders, and marine life is _____.

9. The two classes of poisonous snakes in the United States are _____ _____ and _____ _____.

10. Soaking a wound in _____ water for 30 minutes will break down venom from a stinging or bite wound.

11. _____ is the transfer of heat from one material to another through direct contact.

12. _____ occurs when currents of air or water pass over the body, carrying away heat.

13. _____ is heat the body sends out in waves.

14. Most radiant heat loss occurs from a person's _____ and _____.

15. _____ is a form of heat loss that occurs when the body perspires or gets wet.

16. _____ causes loss of body heat as a result of exhaled warm air.

17. When cooling affects the entire body, a problem known as _____ develops.

18. Application of an external heat source to the body is known as _____ _____.

19. Application of heat to the lateral chest, neck, armpits, and groin is known as _____ _____.

20. _____ _____ injuries are temperature-related injuries affecting particular parts of the body.

HANDOUT 31-4: Reinforcing Content Mastery Student's Name

ENVIRONMENTAL EMERGENCIES TRUE OR FALSE

Indicate if the following statements are true or false by writing T or F in the space provided.

_____ **1.** If a drowning patient has stopped breathing, an EMT should pronounce the patient dead.

_____ **2.** Injuries to the cervical spine are seen with many water-related accidents.

_____ **3.** Divers increase the risk of decompression sickness if they fly within 12 hours of a dive.

_____ **4.** All spiders are poisonous, but most cannot get their fangs through human skin.

_____ **5.** Snakebites require special care but are usually not life-threatening.

_____ **6.** Shivering is the body's attempt to keep warm.

_____ **7.** Water chill, which happens when the body or clothes get wet, is an example of convectional cooling.

_____ **8.** Administering a drink of alcohol is an effective way to reduce the effects of hypothermia.

_____ **9.** In cases of hypothermia, an EMT should begin active rewarming with the extremities.

_____ **10.** Massaging, or rubbing, of frostbitten areas can cause soft-tissue damage.

HANDOUT 31-5: Reinforcing Content Mastery Student's Name

TREATMENT FOR TEMPERATURE-RELATED EMERGENCIES

List the treatment steps for each of the following temperature-related emergencies.

Hypothermia—Patient Alert and Responding Appropriately

Hypothermia—Patient Unresponsive or Not Responding Appropriately

Patient with Early or Superficial Local Cold Injury

Patient with Late or Deep Local Cold Injury

Hyperthermia—Patient with Moist, Pale, Normal-to-Cool Skin

Hyperthermia—Patient with Hot and Dry or Hot and Moist Skin

Chapter 31 Answer Key

HANDOUT 31-1: Chapter 31 Quiz

1. B	**4.** D	**7.** A	**10.** B	**13.** B
2. B	**5.** B	**8.** C	**11.** A	**14.** D
3. B	**6.** C	**9.** A	**12.** D	**15.** D

HANDOUT 31-2: In the Field

1.The fall coupled with the cold conditions should at least suggest the possibility of hypothermia.

2.Because you suspect the possibility of hypothermia and because police are present to secure the vehicle, you could leave the motor running and the heat turned to high in the patient compartment.

3.The circumstances make the possibility of hypothermia even higher. In addition, because the woman is in her 60s and has suffered a fall, you would want to take in-line manual stabilization as a precaution. To try to protect her from the cold, you would, while maintaining manual stabilization, log roll her onto her side and slip a blanket under her before proceeding with the assessment. You will also want to immobilize her to a long board before transport.

4.Your findings indicate severe hypothermia. This is a priority patient. You should load the patient into the ambulance to prevent further heat loss (taking precautions noted above). Handle the patient as gently as possible to prevent ventricular fibrillation. You should ensure an open airway and provide high-concentration oxygen (warmed and humidified, if possible) via nonrebreather mask. Wrap her in blankets, and transport immediately.

HANDOUT 31-3: Chapter 31 Review

1.frostbite

2.hyperthermia

3. colder

4.neck; spinal

5.air embolism

6.decompression sickness

7.Diver Alert Network

8. venom

9.pit vipers; coral snakes

10.nonscalding/hot

11. Conduction

12. Convection

13. Radiation

14.neck; head

15. Evaporation

16. Respiration

17.hypothermia

18.active rewarming

19.central rewarming

20. Local cold

HANDOUT 31-4: Environmental Emergencies True or False

1. F	**3.** T	**5.** T	**7.** F	**9.** F
2. T	**4.** T	**6.** T	**8.** F	**10.** T

HANDOUT 31-5: Treatment for Temperature-Related Emergencies

Hypothermia—Patient Alert and Responding Appropriately

Remove wet clothing; actively rewarm patient; provide care for shock and oxygen; give warm liquids slowly; transport.

Hypothermia—Patient Unresponsive or Not Responding Appropriately

Remove from environment and protect from further heat loss; ensure open airway; provide high-concentration oxygen, warmed and humidified, if possible; wrap patient in blankets, avoiding rough handling; transport immediately.

Patient with Early or Superficial Local Cold Injury

Remove patient from cold environment; warm affected area; splint and cover if extremity is injured; do not reexpose to cold.

Patient with Late or Deep Local Cold Injury

Administer high-concentration oxygen; remove patient from cold—protect from reexposure; transport without delay; if transport is delayed, follow local protocols on rewarming.

Hyperthermia—Patient with Moist, Pale, Normal-to-Cool Skin

Remove patient from hot environment; administer oxygen via nonrebreather mask at 15 lpm; loosen or remove clothing and cool by fanning; treat for shock; let responsive patient drink sips of water; apply moist towels over cramped muscles; transport.

Hyperthermia—Patient with Hot and Dry or Hot and Moist Skin

Remove from hot environment to cool environment; remove clothing, and apply cool packs to neck, groin, and armpits; administer oxygen at 15 lpm via nonrebreather mask; transport immediately.