Chapter 12 - Shock

1. National EMS Education Standard Competencies (1 of 2)
   Shock and Resuscitation
   Applies a fundamental knowledge of the causes, pathophysiology, and management of shock, respiratory failure or arrest, cardiac failure or arrest, and post-resuscitation management.

2. National EMS Education Standard Competencies (2 of 2)
   Pathophysiology
   Applies fundamental knowledge of the pathophysiology of respiration and perfusion to patient assessment and management.

3. Introduction (1 of 3)
   • Shock (hypoperfusion) describes a state of collapse and failure of the cardiovascular system.
     – In the early stages, the body attempts to maintain homeostasis.
     – As shock progresses, blood circulation slows and eventually ceases.

4. Introduction (2 of 3)
   • Shock can occur because of medical or traumatic events.
     – Heart attack
     – Severe allergic reaction
     – Motor vehicle crash
     – Gunshot wound

5. Introduction (3 of 3)
   • EMTs respond to different types of emergencies to provide care and transportation.
     • They must be constantly alert to the signs and symptoms of shock.

6. Pathophysiology (1 of 13)
   • Perfusion is the circulation of an adequate amount of blood to meet the cells’ current needs.
     – The body is perfused via the circulatory system.
     – Organs, tissues, and cells must have adequate oxygenation or they may die.

7. Pathophysiology (2 of 13)
   • In cases of poor perfusion (shock):
     – Transportation of carbon dioxide out of tissues is impaired.
     – Results in a danger to build up of waste products, which may cause cellular damage

8. Pathophysiology (3 of 13)
   • Shock refers to a state of collapse and failure of the cardiovascular system that leads to inadequate circulation.
     – Shock is an unseen life threat caused by a medical disorder or traumatic injury.
     – If the conditions causing shock are not promptly addressed, death may soon occur.

9. Pathophysiology (4 of 13)
   • Cardiovascular system consists of three parts:
     – Pump (heart)
     – Set of pipes (blood vessels or arteries)
     – Contents (the blood)

10. Pathophysiology (5 of 13)
    11. Pathophysiology (6 of 13)
    • These three parts can be referred to as the “perfusion triangle.”
      – When a patient is in shock, one or more of the three parts is not working properly.

12. Pathophysiology (7 of 13)
    • Blood pressure is the pressure of blood within the vessels at any moment in time.
      – Systolic: peak arterial pressure
      – Diastolic: pressure in the arteries while the heart rests between heartbeats

13. Pathophysiology (8 of 13)
    • Pulse pressure is the difference between the systolic and diastolic pressures.
      – Pulse pressure signifies the amount of force the heart generates with each contraction.
      – A pulse pressure less than 25 mm Hg may be seen in patients with shock.

14. Pathophysiology (9 of 13)
    • Blood flow through the capillary beds is regulated by the capillary sphincters.
      – Under the control of the autonomic nervous system
      – Capillary sphincters respond to other stimuli:
        • Heat
• Cold
• The need for oxygen and waste removal

Pathophysiology (10 of 13)
• Perfusion requires more than just having a working cardiovascular system.
  – Adequate oxygen exchange in the lungs
  – Adequate nutrients in the form of glucose in the blood
  – Adequate waste removal, primarily through the lungs

Pathophysiology (11 of 13)
• Mechanisms are in place to help support the respiratory and cardiovascular systems when the need for perfusion of vital organs is increased.
  – Mechanisms include the autonomic nervous system and hormones.

Pathophysiology (12 of 13)
• Hormones are triggered when the body senses pressure falling.
  – Cause an increase in:
    • Heart rate
    • Strength of cardiac contractions
    • Peripheral vasoconstriction

Pathophysiology (13 of 13)
• Together, these actions are designed to
  – Maintain pressure in the system
  – Sustain perfusion of all vital organs
• It is this response that causes all the signs and symptoms of shock.

Causes of Shock (1 of 3)
• Shock can result from bleeding, respiratory failure, acute allergic reactions, and overwhelming infection.
  – Damage occurs because of insufficient perfusion of organs and tissues.

Causes of Shock (2 of 3)

Causes of Shock (3 of 3)

Cardiogenic Shock (1 of 4)
• Caused by inadequate function of the heart
• A major effect is the backup of blood into the lungs.
• Resulting buildup of pulmonary fluid is called pulmonary edema.

Cardiogenic Shock (2 of 4)
• Edema is the presence of abnormally large amounts of fluid between cells in body tissues, causing swelling.

Cardiogenic Shock (3 of 4)
• Pulmonary edema leads to impaired respiration, which may be manifested by:
  – An increased respiratory rate
  – Abnormal lung sounds

Cardiogenic Shock (4 of 4)
• Cardiogenic shock develops when the heart cannot maintain sufficient output to meet the demands of the body.

Obstructive Shock (1 of 4)
• Caused by a mechanical obstruction that prevents an adequate volume of blood from filling the heart chambers.
• Three of the most common examples:
  – Cardiac tamponade
  – Tension pneumothorax
  – Pulmonary embolism

Obstructive Shock (2 of 4)
• Cardiac tamponade
  – Collection of fluid between the pericardial sac and the myocardium (pericardial effusion) becomes large enough to prevent ventricles from filling with blood.
  – Caused by blunt or penetrating trauma
  – Signs and symptoms are referred to as Beck triad.

Obstructive Shock (3 of 4)
• Tension pneumothorax
  – Caused by damage to lung tissue
  – The air normally held within the lung escapes into the chest cavity.
Chapter 12 - Shock

– The lung collapses, and air applies pressure to the organs, including the heart and great vessels.

30 Obstructive Shock (4 of 4)
• Pulmonary embolism
  – A blood clot that blocks the flow of blood through pulmonary vessels
  – If massive:
    • Can result in complete backup of blood in the right ventricle
    • Leads to catastrophic obstructive shock and complete pump failure

31 Distributive Shock (1 of 11)
• Results from widespread dilation of small arterioles, small venules, or both
• The circulating blood volume pools in the expanded vascular beds.
• Tissue perfusion decreases.

32 Distributive Shock (2 of 11)
• Septic shock
  – Occurs as a result of severe infections in which toxins are generated by bacteria or by infected body tissues.
  – Toxins damage vessel walls, causing increased cellular permeability.
  – Vessel walls leak and are unable to contract well.

33 Distributive Shock (3 of 11)
• Septic shock (cont’d)
  – Widespread dilation of vessels, in combination with plasma loss through the vessel walls, results in shock.

34 Distributive Shock (4 of 11)
• Neurogenic shock
  – Usually the result of high spinal cord injury
  – Causes include:
    • Brain conditions
    • Tumors
    • Pressure on the spinal cord
    • Spina bifida

35 Distributive Shock (5 of 11)
• Neurogenic shock (cont’d)
  – Muscles in the blood vessel walls are cut off from the nerve impulses that cause them to contract.

36 Distributive Shock (6 of 11)
• Anaphylactic shock
  – Occurs when a person reacts violently to a substance to which he or she has been sensitized.
  – Sensitization means becoming sensitive to a substance that did not initially cause a reaction.
  – Each subsequent exposure tends to produce a more severe reaction.

37 Distributive Shock (7 of 11)
• Anaphylactic shock (cont’d)
  – Four categories of exposure include:
    • Injections (tetanus antitoxin, penicillin)
    • Stings (wasps, bees, hornets, ants)
    • Ingestion (fish, shellfish, nuts, eggs, medication)
    • Inhalation (dust, pollen, mold)

38 Distributive Shock (8 of 11)
• Anaphylactic shock (cont’d)
  – Develops within minutes or even seconds of contact with substance
  – Second phase reaction can occur 1 to 8 hours after initial reaction.
  – Signs are very distinct.
  – Cyanosis (blue discoloration of skin) is a late sign.

39 Distributive Shock (9 of 11)

40 Distributive Shock (10 of 11)
• Psychogenic shock
  – Caused by a sudden reaction of the nervous system.
  – Produces temporary, generalized vascular dilation
  – Results in fainting (syncope)
  – Some causes are serious and others are not.

41 Distributive Shock (11 of 11)
• Psychogenic shock (cont’d)
– Life-threatening causes include irregular heartbeat and brain aneurysm.
– Non-life-threatening events include receipt of bad news or experiencing fear or unpleasant sights (such as blood).

42 Hypovolemic Shock (1 of 2)
• Result of an inadequate amount of fluid or volume in the circulatory system
• Hemorrhagic causes and nonhemorrhagic causes
• Occurs with severe thermal burns
  – Intravascular plasma is lost.

43 Hypovolemic Shock (2 of 2)
• Dehydration, the loss of water or fluid from body tissues, can cause or aggravate shock.
  – Fluid loss may be a result of severe vomiting and/or diarrhea.

44 Respiratory Insufficiency (1 of 3)
• A patient with a severe chest injury may be unable to breathe in an adequate amount of oxygen.
  – An insufficient concentration of oxygen in the blood can produce a life-threatening situation as rapidly as vascular causes of shock.

45 Respiratory Insufficiency (2 of 3)
• Anemia is an abnormally low number of red blood cells.
• Hypoxia occurs because blood is unable to deliver adequate amounts of oxygen to the tissues.

46 Respiratory Insufficiency (3 of 3)
• Certain types of poisoning may affect the ability of cells to metabolize or carry oxygen:
  – Carbon monoxide poisoning
  – Cyanide poisoning

47 The Progression of Shock (1 of 4)
• The stages in the progression of shock:
  – Compensated shock: early stage when the body can still compensate for blood loss
  – Decompensated shock: late stage when blood pressure is falling
  – No way to assess when effects are irreversible
• Must recognize and treat shock early

48 The Progression of Shock (2 of 4)
• Signs and symptoms

49 The Progression of Shock (3 of 4)
• Blood pressure may be the last measureable factor to change in shock.
  – When a drop in blood pressure is evident, shock is well developed.
  – Particularly true in infants and children
  – Expect shock in many emergency medical situations

50 The Progression of Shock (4 of 4)
• Also expect shock if a patient has any one of the following conditions:
  – Multiple severe fractures
  – Abdominal or chest injury
  – Spinal injury
  – A severe infection
  – A major heart attack
  – Anaphylaxis

51 Scene Size-Up
• Scene size-up
  – Be alert to potential hazards to your safety.
  – Use gloves and eye protection for trauma scenes or if bleeding is suspected.
  – In incidents involving violence, make sure police are on scene.

52 Primary Assessment (1 of 5)
• Primary assessment
  – Perform a rapid exam.
  – Determine the level of consciousness
  – Identify and manage life-threatening concerns
  – Determine priority of the patient and transport

53 Primary Assessment (2 of 5)
• Primary assessment (cont’d)
  – Provide high-flow oxygen to assist in perfusion
  – For hypoperfusion, treat aggressively and provide rapid transport
Request advanced life support (ALS) as necessary

**Primary Assessment (3 of 5)**
- Primary assessment (cont’d)
  - Form a general impression.
  - Assess the airway to ensure it is patent.
  - Assess breathing.
  - An increased respiratory rate is often an early sign of impending shock.
  - Assess patient's circulatory status.

**Primary Assessment (4 of 5)**
- Primary assessment (cont’d)
  - A rapid pulse suggests compensated shock.
  - In shock or compensated shock, the skin may be cool, clammy, or ashen.
  - Assess for and identify any life-threatening bleeding and treat it at once.

**Primary Assessment (5 of 5)**
- Primary assessment (cont’d)
  - Determine if patient is high priority, if ALS is needed, and which facility to transport to.
  - Trauma patients with shock or a suspicious MOI generally should go to a trauma center.

**History Taking**
- History taking
  - Determine the chief complaint.
  - Obtain a SAMPLE history.

**Secondary Assessment**
- Secondary assessment
  - Begins by repeating the primary assessment, followed by focused assessment
  - If a life-threatening problem is found, treat it immediately.
  - Obtain a complete set of baseline vital signs.
  - Use monitoring devices.

**Reassessment (1 of 2)**
- Reassessment
  - Reassess the patient's:
    - Vital signs
    - Interventions
    - Chief complaint
    - ABCs
    - Mental status

**Reassessment (2 of 2)**
- Reassessment (cont’d)
  - Determine what interventions are needed.
  - Focus on supporting the cardiovascular system.
  - Treat for shock early and aggressively by:
    - Providing oxygen
    - Keeping the patient warm

**Emergency Medical Care for Shock (1 of 3)**
- As soon as you recognize shock, begin treatment.
  - Follow standard precautions.
  - Control all obvious bleeding.
  - Make sure the patient has an open airway.
  - Maintain manual in-line stabilization if necessary, and check breathing and pulse.

**Emergency Medical Care for Shock (2 of 3)**
- As soon as you recognize shock, begin treatment. (cont’d)
  - Comfort, calm, and reassure the patient.
  - Never allow patients to eat or drink anything prior to being evaluated by a physician.
  - If spinal immobilization is indicated, splint the patient on a backboard.
  - Provide oxygen and monitor patient’s breathing.

**Emergency Medical Care for Shock (3 of 3)**
Chapter 12 - Shock

- As soon as you recognize shock, begin treatment. (cont’d)
  - Place blankets under and over the patient.
  - Consider the need for ALS.
  - Do not give the patient anything by mouth, no matter how urgently you are asked.
  - Accurately record the patient’s vital signs approximately every 5 minutes throughout treatment and transport.

64. Treating Cardiogenic Shock
   (1 of 3)
   - Patient cannot generate the power to pump blood throughout the circulatory system.
   - Chronic lung disease will aggravate cardiogenic shock.
   - Patients in cardiogenic shock should not receive nitroglycerin; they are hypotensive.

65. Treating Cardiogenic Shock
   (2 of 3)
   - Patients usually have:
     - Low blood pressure
     - Weak, irregular pulse
     - Cyanosis about lips/underneath fingernails
     - Anxiety
     - Nausea

66. Treating Cardiogenic Shock
   (3 of 3)
   - Place the patient in a position that eases breathing as you give high-flow oxygen.
   - Assist ventilations as necessary.
   - Provide prompt transport.
   - Consider meeting ALS en route to hospital.
   - Provide calm reassurance to a patient with a suspected heart attack.

67. Treating Obstructive Shock
   (1 of 2)
   - For cardiac tamponade:
     - Increasing cardiac output is the priority.
     - Apply high-flow oxygen.
     - Surgery is the only definitive treatment.
     - Pericardiocentesis uses a needle to withdraw blood.
     - Advanced skill; rarely performed in the field

68. Treating Obstructive Shock
   (2 of 2)
   - For tension pneumothorax:
     - Apply high-flow oxygen to prevent hypoxia.
     - Chest decompression is required.
     - Ask for ALS early in call if available, but do not delay transport.

69. Treating Septic Shock
   - Hospital management is required.
   - Use standard precautions and transport.
   - Administer high-flow oxygen.
   - Ventilatory support may be necessary.
   - Use blankets to conserve body heat.
   - Use “sepsis team” if available.

70. Treating Neurogenic Shock
   (1 of 2)
   - For the spinal cord injury patient, use a combination of all known supportive measures.
   - Hospitalization will be required for a long time.

71. Treating Neurogenic Shock
   (2 of 2)
   - Emergency treatment:
     - Obtain and maintain a proper airway.
     - Provide spinal immobilization.
     - Assist inadequate breathing.
     - Conserve body heat.
     - Ensure the most effective circulation.
     - Transport promptly.
Treating Anaphylactic Shock
- Administer epinephrine.
- Promptly transport the patient.
- Provide high-flow oxygen and ventilatory assistance en route.
- A mild reaction may worsen suddenly.
- Consider requesting ALS backup, if available.

Treating Psychogenic Shock
1 of 2
- In an uncomplicated case of fainting, once the patient collapses, circulation to the brain is restored.
- Psychogenic shock can worsen other types of shock.
- If the patient falls, check for injuries.

Treating Psychogenic Shock
2 of 2
- If the patient reports being unable to walk after a fall, suspect another problem.
  - Transport the patient promptly.
  - Record all initial observations and try to learn from bystanders:
    - If the patient complained of anything
    - How long the patient was unconscious

Treating Hypovolemic Shock
- Control all obvious external bleeding.
- Keep the patient warm.
- Recognize internal bleeding and provide aggressive support.
- Secure and maintain an airway, and provide respiratory support.
- Transport as rapidly as possible.

Treating Respiratory Insufficiency
- Secure and maintain the airway.
- Clear the mouth and throat of obstructions.
- If necessary, provide ventilations with a BVM.
- Administer supplemental oxygen.
- Transport the patient promptly.

Treating Shock in Older Patients
- The EMT must use caution when caring for older patients.
- Older patients have more serious complications than younger ones.
- Illness is not just a part of aging.
- Many older patients take medications that mask or mimic signs of shock.

Review
1. The term "shock" is MOST accurately defined as:
   A. a decreased supply of oxygen to the brain.
   B. cardiovascular collapse leading to inadequate perfusion.
   C. decreased circulation of blood within the venous circulation.
   D. decreased function of the respiratory system leading to hypoxia.

Response: B
Answer: B
Response: Shock, or hypoperfusion, refers to a state of collapse and failure of the cardiovascular system, or any one of its components (eg, heart, vasculature, blood volume), which leads to inadequate perfusion of the body's cells and tissues.

Review (1 of 2)
1. The term "shock" is MOST accurately defined as:
   A. a decreased supply of oxygen to the brain.
   Rationale: It may be a result of inadequate perfusion, but it is not the definition of shock.
   B. cardiovascular collapse leading to inadequate perfusion.
   Rationale: Correct answer

Review (2 of 2)
1. The term "shock" is MOST accurately defined as:
   C. decreased circulation of blood within the venous circulation.
   Rationale: It may be a result of cardiovascular collapse, but it is not the definition of shock.
   D. decreased function of the respiratory system leading to hypoxia.
Rationale: Decreased function of the respiratory system will lead to hypoxia, which will cause cardiovascular collapse and eventually shock.

**Review**

2. Anaphylactic shock is typically associated with:
   - A. urticaria.
   - B. bradycardia.
   - C. localized welts.
   - D. a severe headache.

**Rationale:** Urticaria (hives) is typically associated with allergic reactions—mild, moderate, and severe. They are caused by the release of histamines from the immune system. In anaphylactic shock, urticaria is also accompanied by cool, clammy skin; tachycardia; severe respiratory distress; and hypotension.

**Review (1 of 2)**

2. Anaphylactic shock is typically associated with:
   - A. urticaria.
     - **Rationale:** Correct answer
   - B. bradycardia.
     - **Rationale:** Tachycardia, not bradycardia, is a symptom of anaphylactic shock.

**Review (2 of 2)**

2. Anaphylactic shock is typically associated with:
   - C. localized welts.
     - **Rationale:** Welts are a raised ridge or bump on the skin caused by a lash from a whip, a scratch, or a similar blow.
   - D. a severe headache.
     - **Rationale:** Altered mental status secondary to hypoxia may be a symptom, but not a headache.

**Review**

3. Signs of compensated shock include all of the following, EXCEPT:
   - A. restlessness or anxiety.
   - B. pale, cool, clammy skin.
   - C. a feeling of impending doom.
   - D. weak or absent peripheral pulses.

**Rationale:** In compensated shock, the body is able to maintain perfusion to the vital organs of the body via the autonomic nervous system. Signs include pale, cool, clammy skin; restlessness or anxiety; a feeling of impending doom; and tachycardia. When the body's compensatory mechanism fails, the patient's blood pressure falls; weak or absent peripheral pulses indicates this.

**Review**

3. Signs of compensated shock include all of the following, EXCEPT:
   - A. restlessness or anxiety.
     - **Rationale:** This indicates compensated shock.
   - B. pale, cool, clammy skin.
     - **Rationale:** This indicates compensated shock.
   - C. a feeling of impending doom.
     - **Rationale:** This indicates compensated shock and the anxiety associated with it.
   - D. weak or absent peripheral pulses.
     - **Rationale:** Correct answer

**Review**

4. When treating a trauma patient who is in shock, LOWEST priority should be given to:
   - A. spinal protection.
   - B. thermal management.
   - C. splinting fractures.
   - D. notifying the hospital.

**Rationale:** Critical interventions for a trauma patient in shock include spinal precautions, high-flow oxygen (or assisted ventilation), thermal management, rapid transport, and early notification of a trauma center. Splinting fractures should not be performed at the scene if the patient is critically injured; it takes too long and only delays transport.

**Review (1 of 2)**

4. When treating a trauma patient who is in shock, LOWEST priority should be given to:
A. spinal protection.
   Rationale: Stabilization of the spine must take place during the first interaction with a trauma patient.
B. thermal management.
   Rationale: Preventing hypothermia is standard treatment.

Review (2 of 2)
4. When treating a trauma patient who is in shock, LOWEST priority should be given to:
   C. splinting fractures.
   Rationale: Correct answer
   D. notifying the hospital.
   Rationale: Trauma centers need to be notified early during patient interaction and transport.

Review
5. Potential causes of cardiogenic shock include all of the following, EXCEPT:
   A. inadequate heart function.
   B. disease of muscle tissue.
   C. severe bacterial infection.
   D. impaired electrical system.

Answer: C
Rationale: Cardiogenic shock is caused by inadequate function of the heart, or pump failure. Within certain limits, the heart
   can adapt to these problems. If too much muscular damage occurs, however, as sometimes happens after a heart attack, the
   heart no longer functions well. Other causes include disease, injury, and an impaired electrical system.

Review
5. Potential causes of cardiogenic shock include all of the following EXCEPT:
   A. inadequate heart function.
      Rationale: This is a cause of cardiogenic shock.
   B. disease of muscle tissues.
      Rationale: This is a cause of cardiogenic shock.
   C. severe bacterial infection.
      Rationale: Correct answer.
   D. impaired electrical system.
      Rationale: This is a cause of cardiogenic shock.

Review
6. A 60-year-old woman presents with a
   BP of 80/60 mm Hg, a pulse rate of
   110 beats/min, mottled skin, and a temperature of 103.9°F. She is MOST likely experiencing:
   A. septic shock.
   B. neurogenic shock.
   C. profound heart failure.
   D. a severe viral infection.

Answer: A
Rationale: In septic shock, bacterial toxins damage the blood vessel walls, causing them to leak and rendering them unable to
   constrict. Widespread dilation of the vessels, in combination with plasma loss through the injured vessel walls, results in
   shock. A high fever commonly accompanies a bacterial infection.

Review (1 of 2)
6. A 60-year-old woman presents with a BP of
   80/60 mm Hg, a pulse rate of 110 beats/min, mottled skin, and a temperature of 103.9°F. She is MOST likely experiencing:
   A. septic shock.
      Rationale: Correct answer
   B. neurogenic shock.
      Rationale: Neurogenic shock is an injury to the nervous system and shows bradycardia and hypotension—not fever.

Review (2 of 2)
6. A 60-year-old woman presents with a BP of
   80/60 mm Hg, a pulse rate of 110 beats/min, mottled skin, and a temperature of 103.9°F. She is MOST likely experiencing:
   C. profound heart failure.
      Rationale: This is part of cardiogenic shock, associated with low blood pressure, weak pulse, and cyanotic skin.
   D. a severe viral infection.
      Rationale: Septic shock is caused by a bacterial infection.
Chapter 12 - Shock

7. A patient with neurogenic shock would be LEAST likely to present with:
   A. tachypnea.
   B. hypotension.
   C. tachycardia.
   D. altered mentation.

**Review**
Answer: C
Rationale: In neurogenic shock, the nerves that control the sympathetic nervous system are compromised. The nervous system is responsible for secreting the hormones epinephrine and norepinephrine, which increase the patient’s heart rate, constrict the peripheral vasculature, and shunt blood to the body’s vital organs. Without the release of these hormones, the compensatory effects of tachycardia and peripheral vasoconstriction are absent.

**Review (1 of 2)**
7. A patient with neurogenic shock would be LEAST likely to present with:
   A. tachypnea.
   Rationale: Respirations increase to compensate for the hypoxia associated with shock.
   B. hypotension.
   Rationale: Hypotension results from massive vasodilation.

**Review (2 of 2)**
7. A patient with neurogenic shock would be LEAST likely to present with:
   C. tachycardia.
   Rationale: Correct answer
   D. altered mentation.
   Rationale: The patient will present with mental status changes secondary to hypoxia.

8. A 20-year-old man was kicked numerous times in the abdomen during an assault. His abdomen is rigid and tender, his heart rate is 120 beats/min, and his respirations are 30 breaths/min. You should treat this patient for:
   A. a lacerated liver.
   B. a ruptured spleen.
   C. respiratory failure.
   D. hypovolemic shock.

**Review**
Answer: D
Rationale: The patient may have a liver laceration or ruptured spleen—both of which can cause internal blood loss. However, it is far more important to recognize that the patient is in hypovolemic shock and to treat him accordingly.

**Review (1 of 2)**
8. A 20-year-old man was kicked numerous times in the abdomen during an assault. His abdomen is rigid and tender, his heart rate is 120 beats/min, and his respirations are 30 breaths/min. You should treat this patient for:
   A. a lacerated liver.
   Rationale: You cannot treat a lacerated liver in the field. You can treat the symptoms of hypovolemic shock associated with the injury.
   B. a ruptured spleen.
   Rationale: You cannot treat a ruptured spleen in the field. You can treat the symptoms of hypovolemic shock associated with the injury.

**Review (2 of 2)**
8. A 20-year-old man was kicked numerous times in the abdomen during an assault. His abdomen is rigid and tender, his heart rate is 120 beats/min, and his respirations are 30 breaths/min. You should treat this patient for:
   C. respiratory failure.
   Rationale: If you treat the hypovolemic shock, then you will treat the respiratory compromise as well.
   D. hypovolemic shock.
   Rationale: Correct answer

9. A 33-year-old woman presents with a generalized rash, facial swelling, and hypotension approximately 10 minutes after being stung by a hornet. Her BP is 70/50 mm Hg and her heart rate is 120 beats/min. In addition to high-flow oxygen, this patient is in MOST immediate need of:
   A. epinephrine.
   B. rapid transport.
   C. an antihistamine.
   D. IV fluids.

**Review**
Answer: A
Rationale: This patient is in anaphylactic shock—a life-threatening overexaggeration of the immune system that results in bronchoconstriction and hypotension. After ensuring adequate oxygenation and ventilation, the MOST important treatment for the patient is epinephrine, which dilates the bronchioles and constricts the vasculature, thus improving breathing and blood pressure, respectively.

Review (1 of 2)

9. A 33-year-old woman presents with a generalized rash, facial swelling, and hypotension approximately 10 minutes after being stung by a hornet. Her BP is 70/50 mm Hg and her heart rate is 120 beats/min. In addition to high-flow oxygen, this patient is in MOST immediate need of:
   A. epinephrine.
      Rationale: Correct answer
   B. rapid transport.
      Rationale: Rapid transport follows high-flow oxygen and epinephrine administration.

Review (2 of 2)

9. A 33-year-old woman presents with a generalized rash, facial swelling, and hypotension approximately 10 minutes after being stung by a hornet. Her BP is 70/50 mm Hg and her heart rate is 120 beats/min. In addition to high-flow oxygen, this patient is in MOST immediate need of:
   C. an antihistamine.
      Rationale: This is an ALS treatment.
   D. IV fluids.
      Rationale: This is an ALS treatment.

Review

10. All of the following are potential causes of impaired tissue perfusion, EXCEPT:
    A. increased number of red blood cells.
    B. pump failure.
    C. low fluid volume.
    D. poor vessel function.

Review

10. All of the following are potential causes of impaired tissue perfusion, EXCEPT:
    A. increased number of red blood cells.
       Rationale: Correct answer
    B. pump failure.
       Rationale: Pump failure is a cause of impaired tissue perfusion.

Review

10. All of the following are potential causes of impaired tissue perfusion EXCEPT:
    C. low fluid volume.
       Rationale: Poor vessel function is a cause of impaired tissue perfusion.
    D. poor vessel function.
       Rationale: Poor vessel function is a cause of impaired tissue perfusion.