Chapter 10

Shock

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.

National EMS Education Standard Competencies (2 of 2)

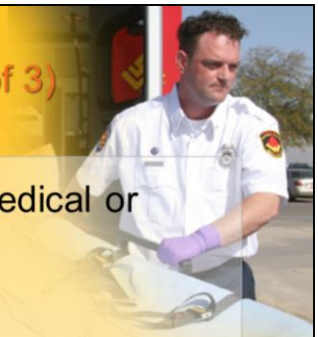
Pathophysiology

Applies fundamental knowledge of the pathophysiology of respiration and perfusion to patient assessment and management.

Introduction (1 of 3)

- Shock (hypoperfusion) means 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.

Introduction (2 of 3)



- Shock can occur because of medical or traumatic events.
  - Heart attack
  - Severe allergic reaction
  - Automobile crash
  - Gunshot wound

Introduction (3 of 3)

- As an EMT, you cannot go wrong assuming that every patient is in shock or may go into shock.

Pathophysiology (1 of 9)

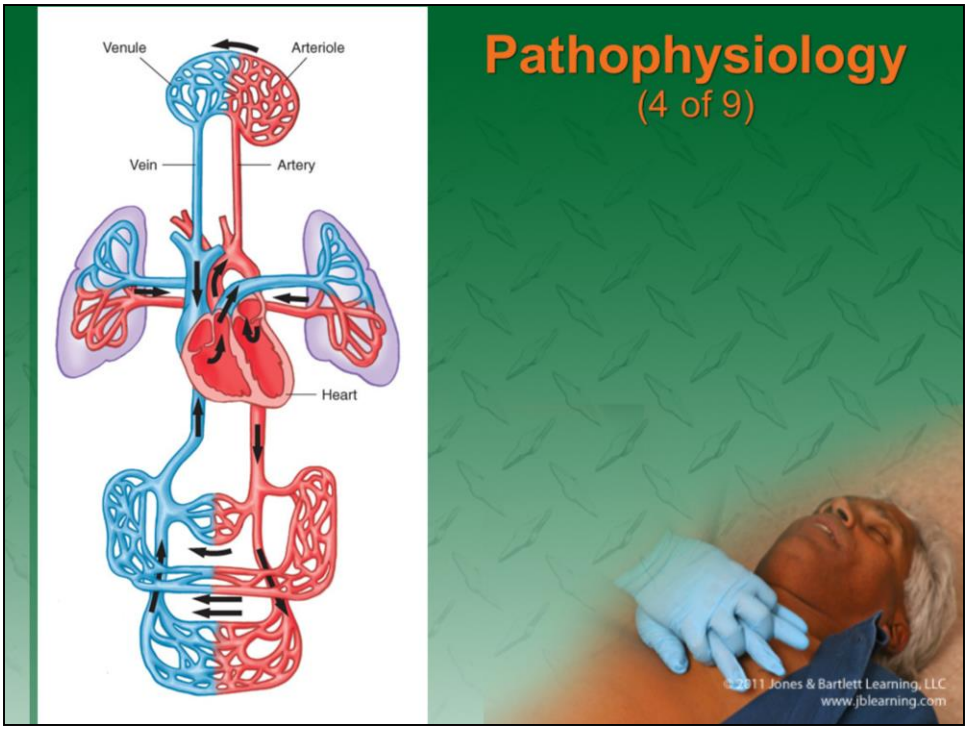
- Perfusion is the circulation of an adequate amount of blood to meet the cells' current needs.
  - The body is perfused via the circulatory system.
  - Organs, tissues, and cells must have adequate oxygenation or they may die.

Pathophysiology (2 of 9)

- 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 symptoms of shock are not promptly addressed, the patient will soon die.

Pathophysiology (3 of 9)

- Cardiovascular system has three parts:
  - Pump (heart)
  - Set of pipes (blood vessels and arteries)
  - Contents (the blood)


Venule
Arteriole
Vein
Artery
Heart
Pathophysiology
(4 of 9)
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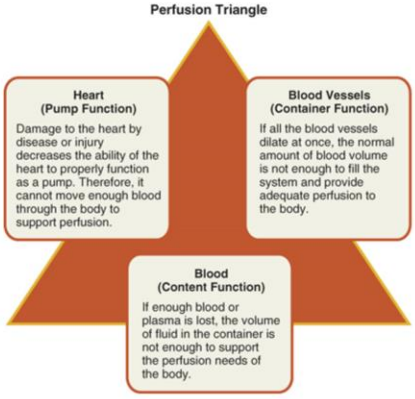
Pathophysiology (5 of 9)



- These three parts can be called the "perfusion triangle."
  - When a patient is in shock, one or more of the three parts is not working properly.

Pathophysiology (6 of 9)

- Blood pressure is the pressure of blood within the vessels at any one time.
  - Systolic: peak arterial pressure
  - Diastolic: pressure in the arteries while the heart rests between heartbeats

Pathophysiology (7 of 9)

- Blood flow through the capillary beds is regulated by the capillary sphincters.
  - Under the control of the autonomic nervous system
  - Sphincters respond to other stimuli:
    - Heat
    - Cold
    - The need for oxygen and waste removal

Pathophysiology (8 of 9)

- 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 (9 of 9)

- 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.

Causes of Shock (1 of 2)

- 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 2)

A **Pump failure**
Causes: Heart attack, trauma to heart, obstructive causes

B **Low fluid volume**
Causes: Trauma to vessels or tissues, fluid loss from GI tract (vomiting/diarrhea can also lower the fluid component of blood)

C **Poor vessel function**
Causes: Infection, drug overdose (narcotic), spinal cord injury, anaphylaxis

Table 10-1 Causes of Shock

Pump Failure
- Cardiogenic shock
- Obstructive shock

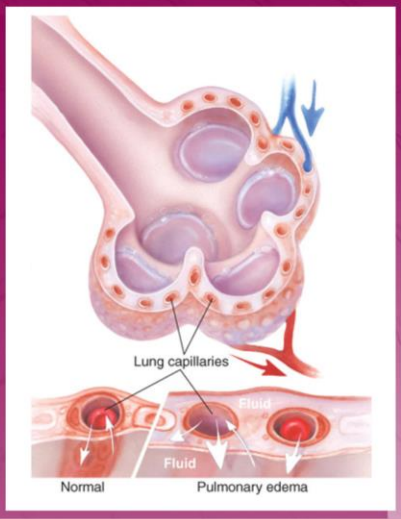
Poor Vessel Function
- Distributive shock
  - Septic shock
  - Neurogenic shock
  - Anaphylactic shock
  - Psychogenic shock

Low Fluid Volume
- Hypovolemic shock
  - Hemorrhagic shock
  - Nonhemorrhagic shock

Cardiogenic Shock (1 of 3)

- 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 3)

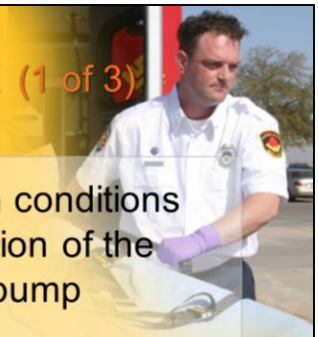


- Edema is the presence of abnormally large amounts of fluid between cells in body tissues, causing swelling.

Cardiogenic Shock (3 of 3)

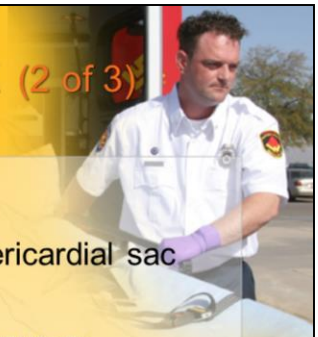
- Cardiogenic shock develops when the heart cannot maintain sufficient output to meet the demands of the body.

Obstructive Shock (1 of 3)



- Obstructive shock occurs when conditions that cause mechanical obstruction of the cardiac muscle also affect the pump function
- Common examples include cardiac tamponade and tension pneumothorax.

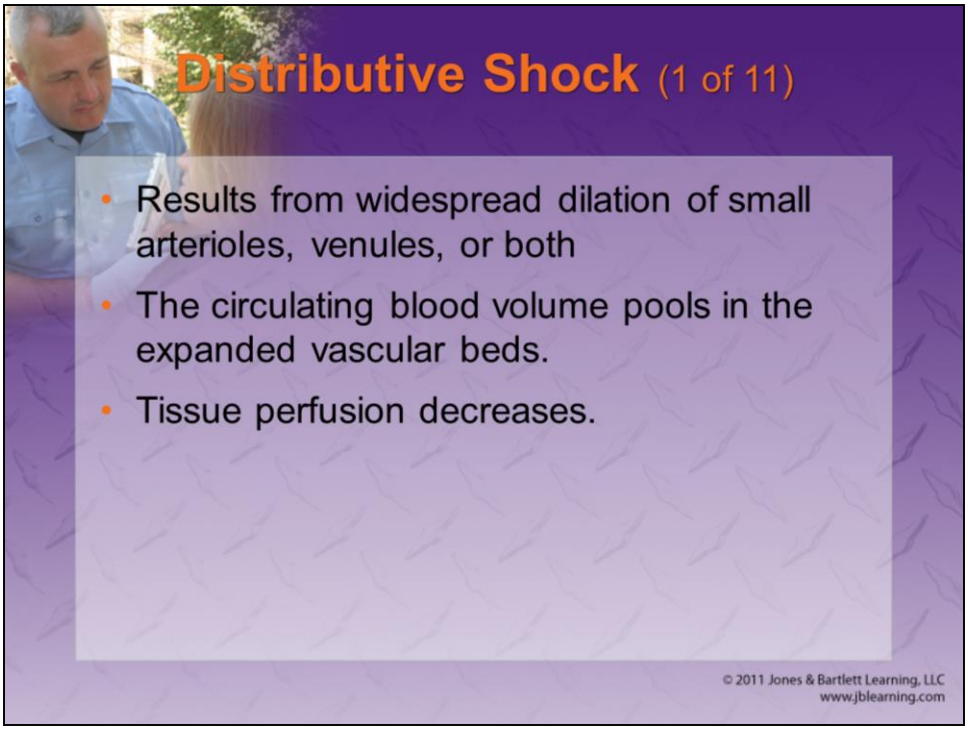
Obstructive Shock (2 of 3)



- Cardiac tamponade
  - Collection of fluid between the pericardial sac and the myocardium
  - Caused by blunt or penetrating trauma
  - Can progress rapidly
  - Signs and symptoms are referred to as Beck's triad.

Obstructive Shock (3 of 3)

- Tension pneumothorax
  - Caused by damage to lung tissue
  - The air normally held within the lung escapes into the chest cavity.
  - This air applies pressure to the organs, including the heart.


Distributive Shock (1 of 11)
• Results from widespread dilation of small arterioles, venules, or both
• The circulating blood volume pools in the expanded vascular beds.
• Tissue perfusion decreases.
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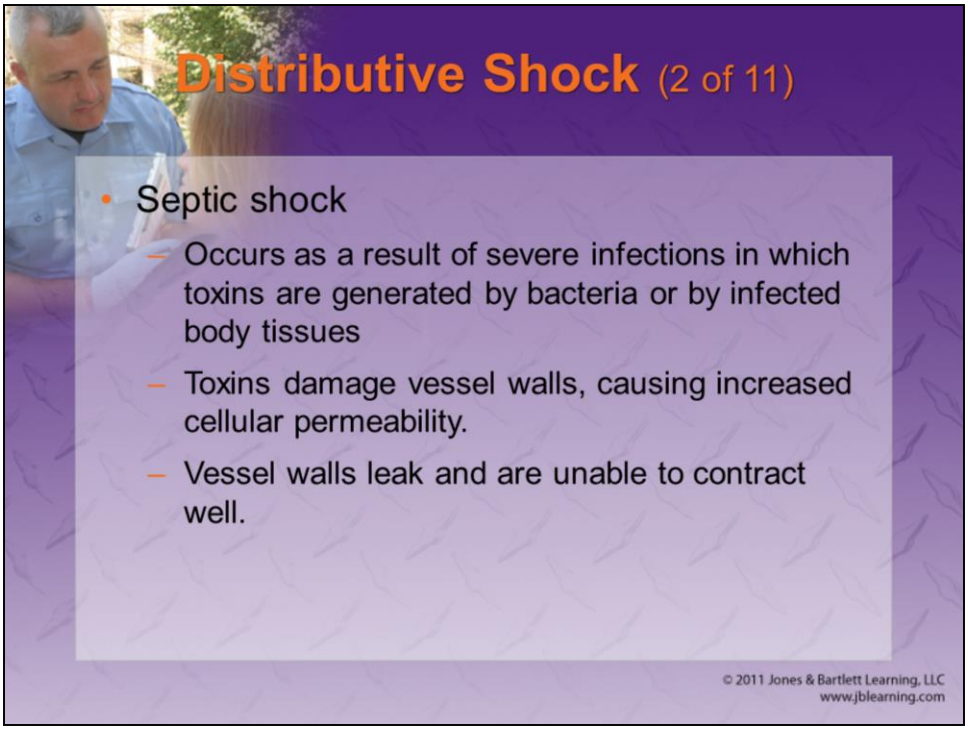
Distributive Shock (2 of 11)
• Septic shock
– Occurs as a result of severe infections in which toxins are generated by bacteria or by infected body tissues
– Toxins damage vessel walls, causing increased cellular permeability.
– Vessel walls leak and are unable to contract well.
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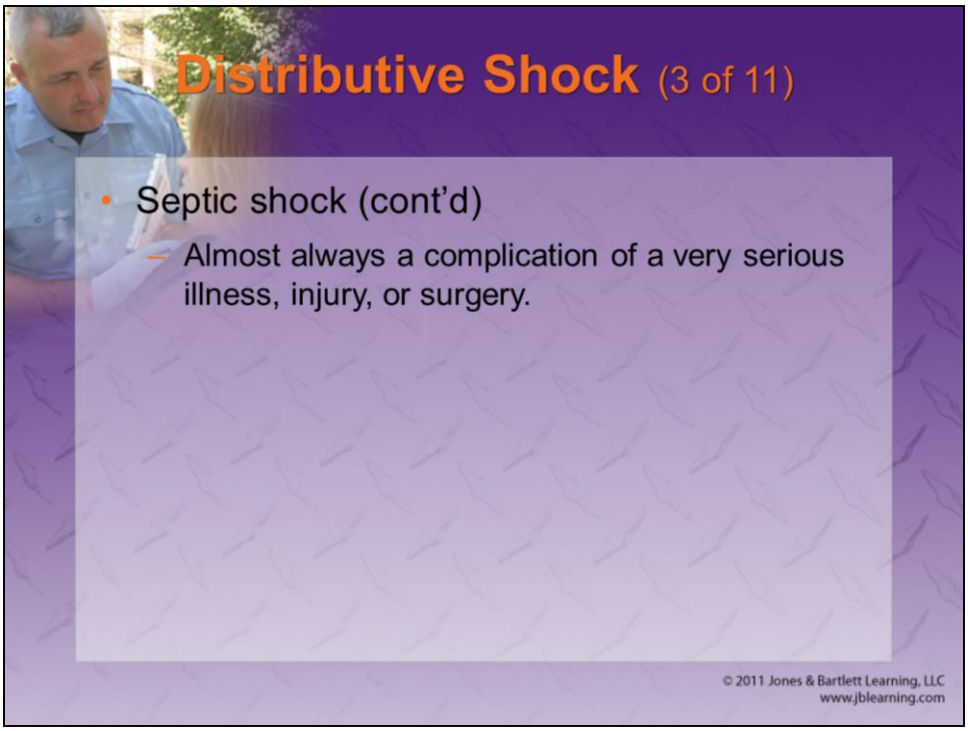
Distributive Shock (3 of 11)
Septic shock (cont'd)
Almost always a complication of a very serious illness, injury, or surgery.
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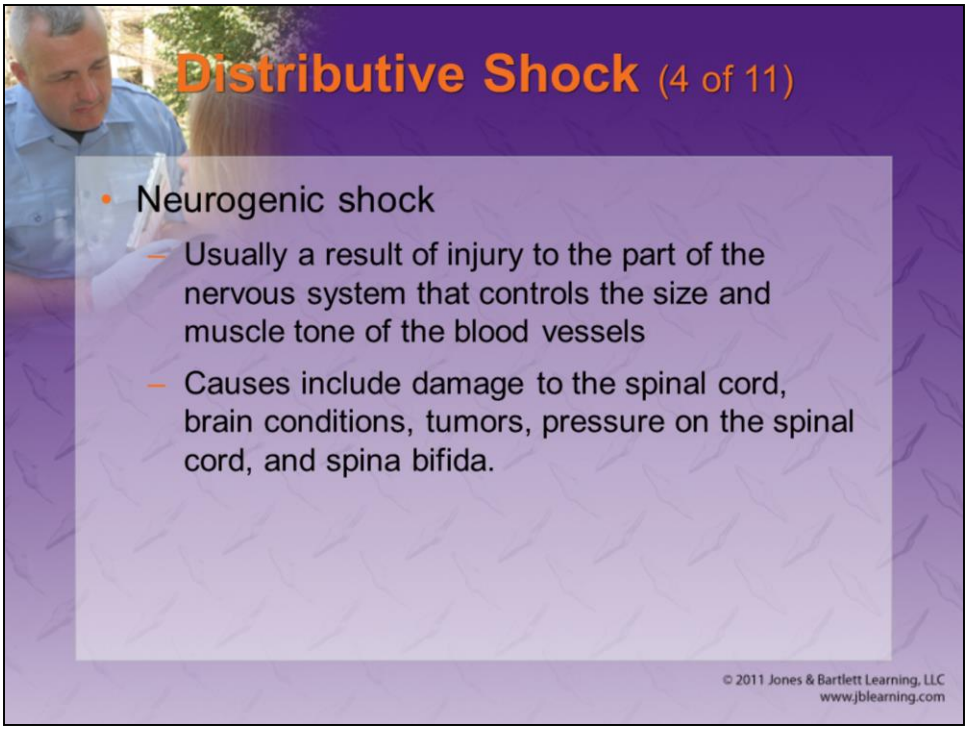
Distributive Shock (4 of 11)
Neurogenic shock
Usually a result of injury to the part of the nervous system that controls the size and muscle tone of the blood vessels
Causes include damage to the spinal cord, brain conditions, tumors, pressure on the spinal cord, and spina bifida.
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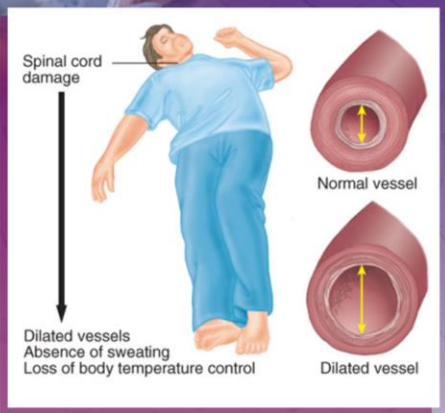
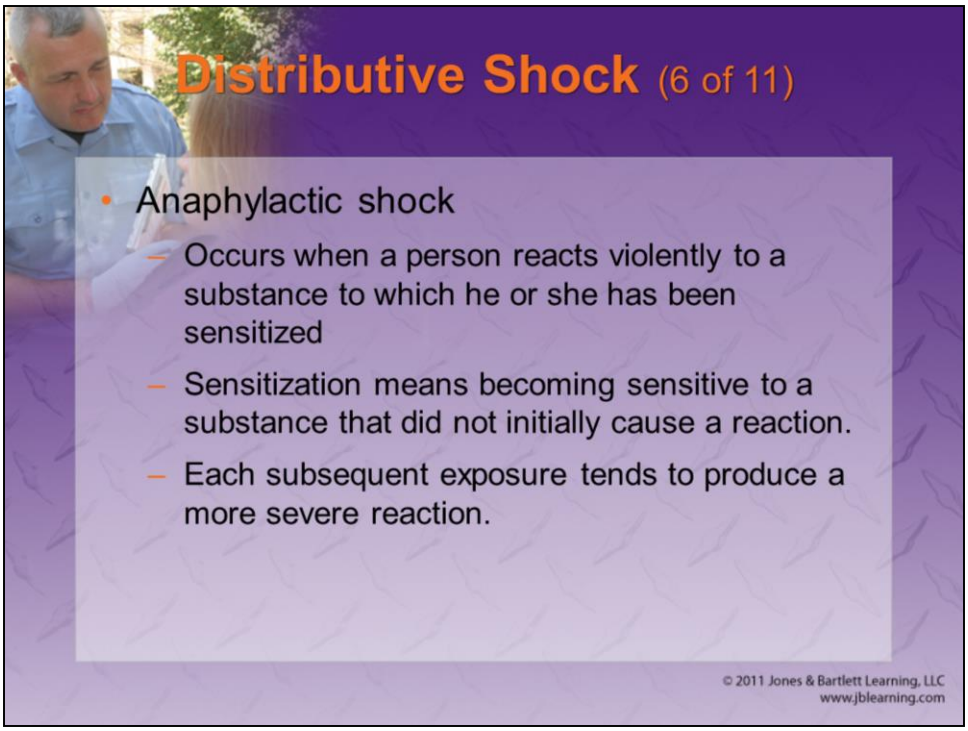
Distributive Shock (5 of 11)



- Neurogenic shock (cont'd)
  - Muscles in the blood vessel walls are cut off from nerve impulses that cause them to contract.


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.
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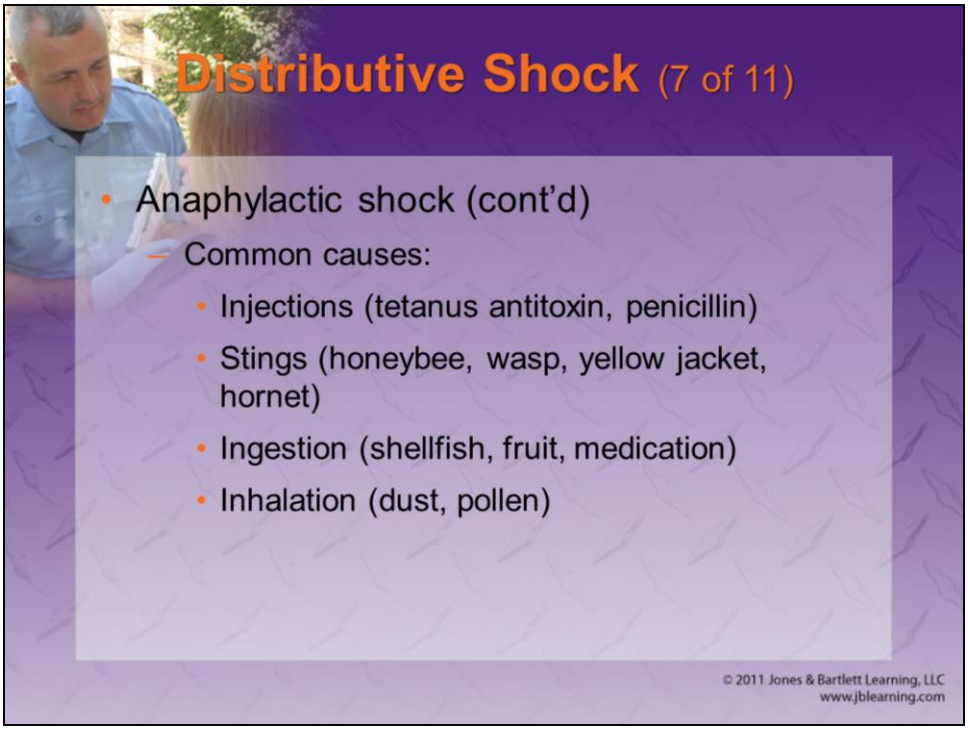
Distributive Shock (7 of 11)
• Anaphylactic shock (cont'd)
– Common causes:
• Injections (tetanus antitoxin, penicillin)
• Stings (honeybee, wasp, yellow jacket, hornet)
• Ingestion (shellfish, fruit, medication)
• Inhalation (dust, pollen)
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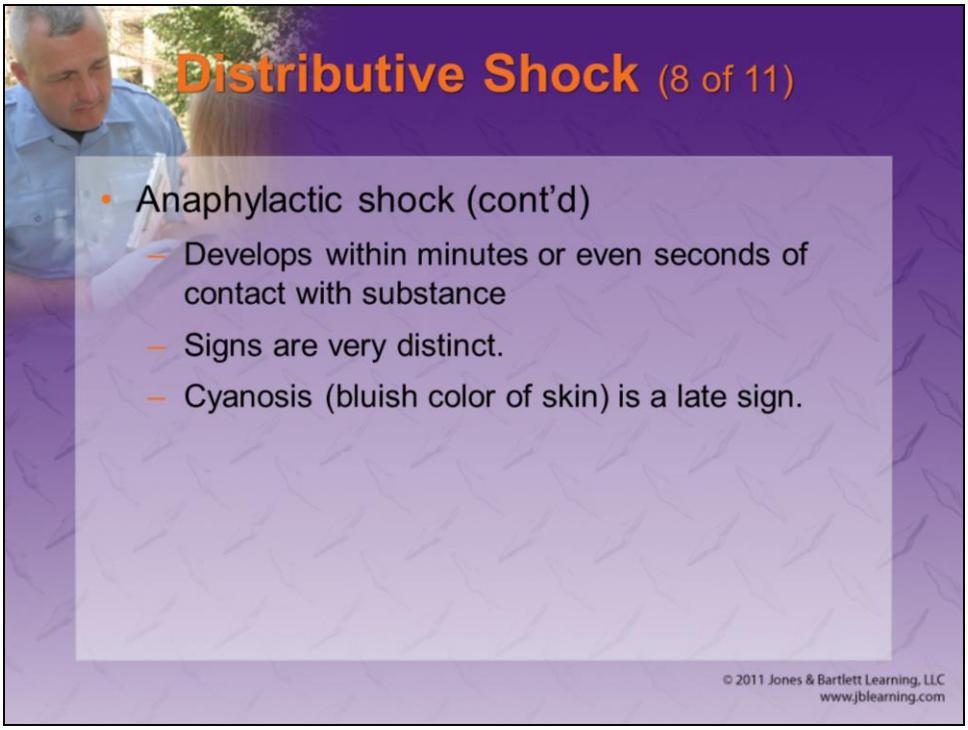
Distributive Shock (8 of 11)
• Anaphylactic shock (cont'd)
– Develops within minutes or even seconds of contact with substance
– Signs are very distinct.
– Cyanosis (bluish color of skin) is a late sign.
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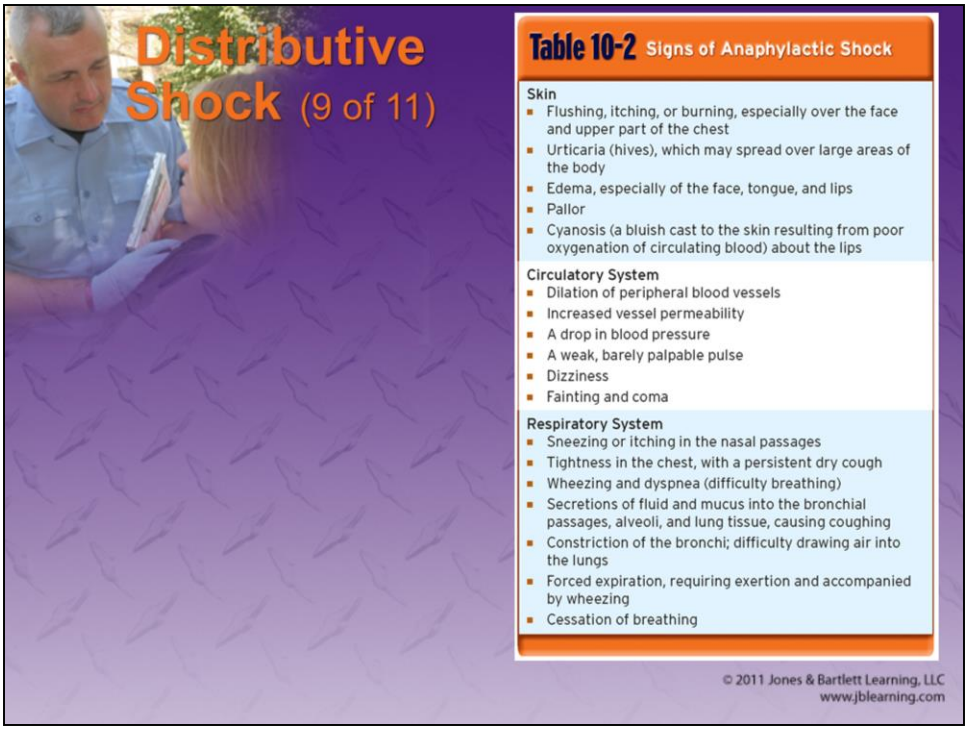
Distributive Shock (9 of 11)
Table 10-2 Signs of Anaphylactic Shock
Skin
Flushing, itching, or burning, especially over the face and upper part of the chest
Urticaria (hives), which may spread over large areas of the body
Edema, especially of the face, tongue, and lips
Pallor
Cyanosis (a bluish cast to the skin resulting from poor oxygenation of circulating blood) about the lips
Circulatory System
Dilation of peripheral blood vessels
Increased vessel permeability
A drop in blood pressure
A weak, barely palpable pulse
Dizziness
Fainting and coma
Respiratory System
Sneezing or itching in the nasal passages
Tightness in the chest, with a persistent dry cough
Wheezing and dyspnea (difficulty breathing)
Secretions of fluid and mucus into the bronchial passages, alveoli, and lung tissue, causing coughing
Constriction of the bronchi; difficulty drawing air into the lungs
Forced expiration, requiring exertion and accompanied by wheezing
Cessation of breathing
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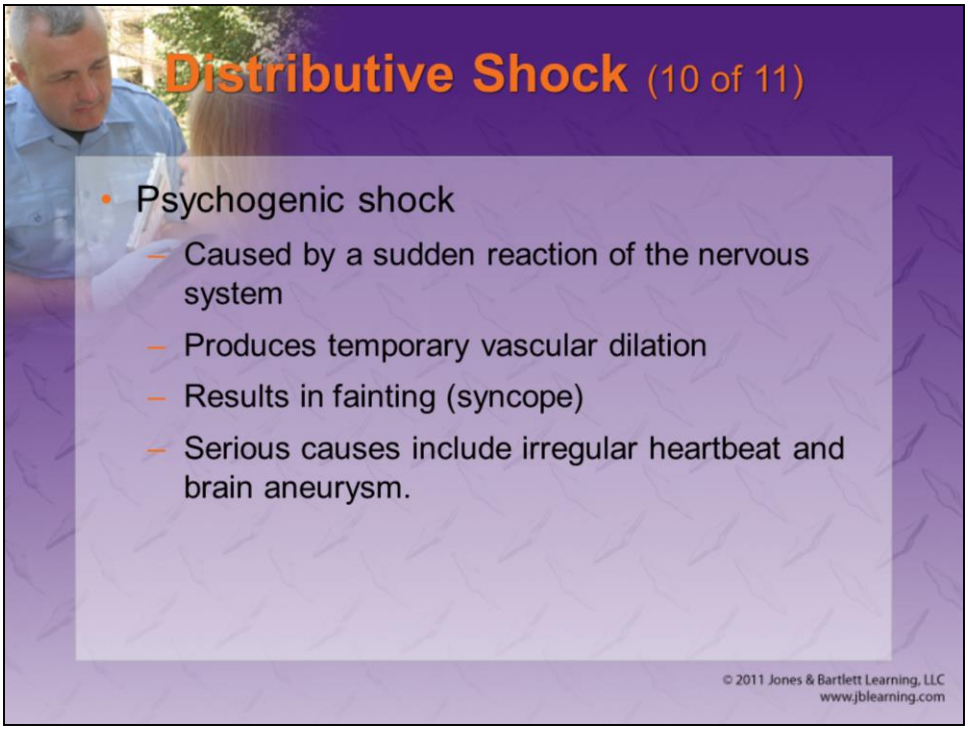
Distributive Shock (10 of 11)
• Psychogenic shock
– Caused by a sudden reaction of the nervous system
– Produces temporary vascular dilation
– Results in fainting (syncope)
– Serious causes include irregular heartbeat and brain aneurysm.
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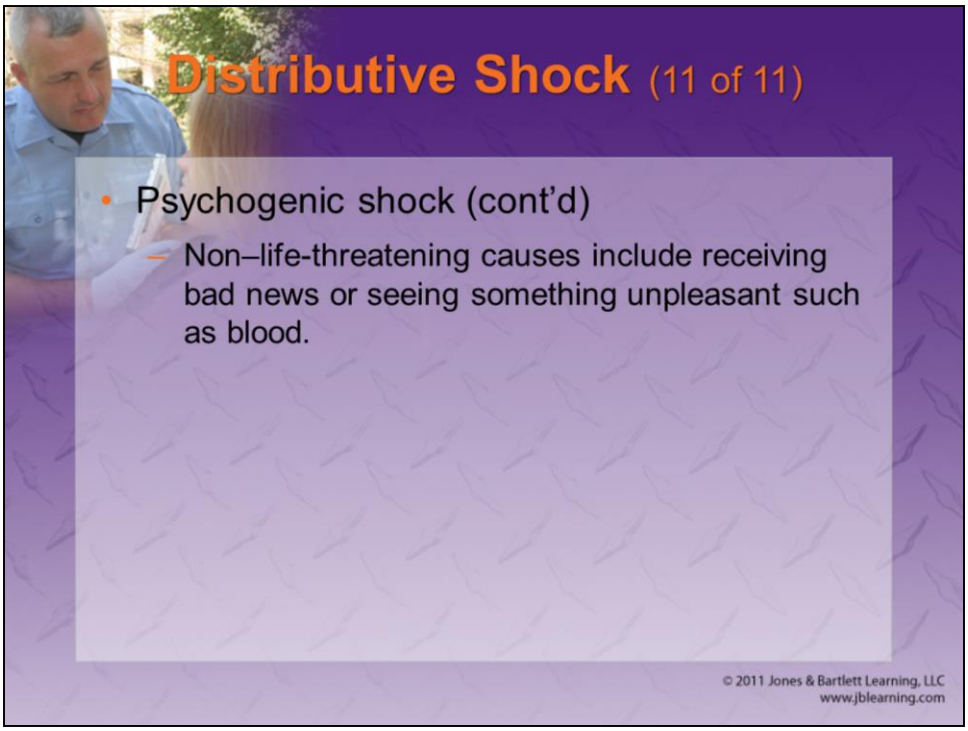
Distributive Shock (11 of 11)
• Psychogenic shock (cont'd)
– Non–life-threatening causes include receiving bad news or seeing something unpleasant such as blood.
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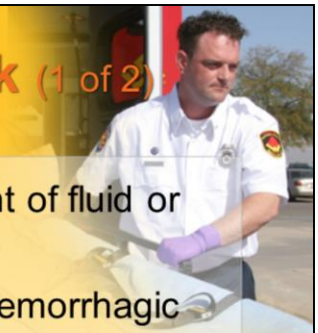
Hypovolemic Shock (1 of 2)



- Result of an inadequate amount of fluid or volume in the system
- Hemorrhagic causes and nonhemorrhagic causes
- Occurs with severe thermal burns
  - Intravascular plasma is lost.

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.

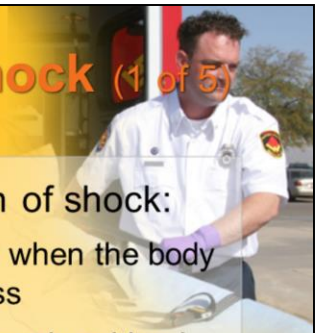
Respiratory Insufficiency (1 of 2)

- 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 shock as rapidly as vascular causes.

Respiratory Insufficiency (2 of 2)

- Certain types of poisoning may affect the ability of cells to metabolize or carry oxygen:
  - Carbon monoxide poisoning
  - Cyanide poisoning
- Anemia occurs when there is an abnormally low number of red blood cells.

The Progression of Shock (1 of 5)



- Three 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 falls
  - Irreversible shock: terminal stage when transfusion is not enough to save patient

Table 10-3 Progression of Shock

Compensated Shock

- Agitation
- Anxiety
- Restlessness
- Feeling of impending doom
- Altered mental status
- Weak, rapid (thready), or absent pulse
- Clammy (pale, cool, moist) skin
- Pallor, with cyanosis about the lips
- Shallow, rapid breathing
- Air hunger (shortness of breath), especially if there is a chest injury
- Nausea or vomiting
- Capillary refill of longer than 2 seconds in infants and children
- Marked thirst

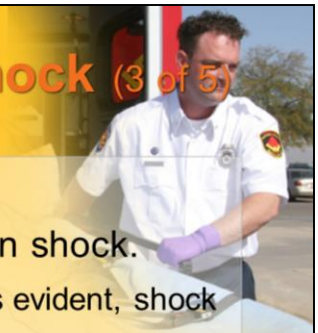
Decompensated Shock

- Falling blood pressure (systolic blood pressure of 90 mm Hg or lower in an adult)
- Labored or irregular breathing
- Ashen, mottled, or cyanotic skin
- Thready or absent peripheral pulses
- Dull eyes, dilated pupils
- Poor urinary output

The Progression of Shock (2 of 5)

- Signs and symptoms

The Progression of Shock (3 of 5)



- 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

The Progression of Shock (4 of 5)

- Use caution when caring for elderly patients.
- Treating a pediatric or geriatric patient in shock is no different than treating other shock patients.
- Expect shock in many emergency medical situations.

The Progression of Shock (5 of 5)

- Also expect shock if a patient has any one of the following conditions:
  - Multiple severe fractures
  - Abdominal or chest injury
  - Spinal injury
  - Severe infection
  - Major heart attack or anaphylaxis

Patient Assessment for Shock

- Patient assessment steps
  - Scene size-up
  - Primary assessment
  - History taking
  - Secondary assessment
  - Reassessment

Scene Size-Up

- Scene size-up
  - Ensure the scene is safe for you, your partner, your patient, and bystanders.
  - Determine the necessary standard precautions and whether you will need additional resources.
  - Observe the scene and patient for clues to determine the MOI/NOI.

Primary Assessment (1 of 3)

- Primary assessment
  - Perform a rapid scan.
  - Treat according to the ABCs.
  - Significant bleeding, internal or external, is an immediate life threat.
  - Provide high-flow oxygen to assist in perfusion of damaged tissues.

Primary Assessment (2 of 3)

- 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.
  - Check for a distal pulse.

Primary Assessment (3 of 3)

- Primary assessment (cont'd)
  - A rapid pulse suggests compensated shock.
  - In compensated shock, the skin may be cool, clammy, or ashen.
  - Trauma patients with shock, or a suspicious MOI, generally should go to a trauma center.

History Taking

- History taking
  - Investigate the chief complaint.
  - Obtain a SAMPLE history.

Secondary Assessment

- Secondary assessment
  - Physical examination with a full-body scan
  - Assess the respiratory system, neurologic system, musculoskeletal system, and all anatomic regions.
  - Obtain a complete set of baseline vital signs.
  - Use monitoring devices.

Reassessment

- Reassessment
  - Determine what interventions are needed.
  - Patients who are in decompensated shock will need rapid interventions to restore adequate perfusion.
  - Determine whether your patient is in compensated or decompensated shock.
  - Document these findings.

Emergency Medical Care for Shock

- As soon as you recognize shock, begin treatment.
  - See **Skill Drill 10-1**.
  - 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.

Treating Cardiogenic Shock
(1 of 3)

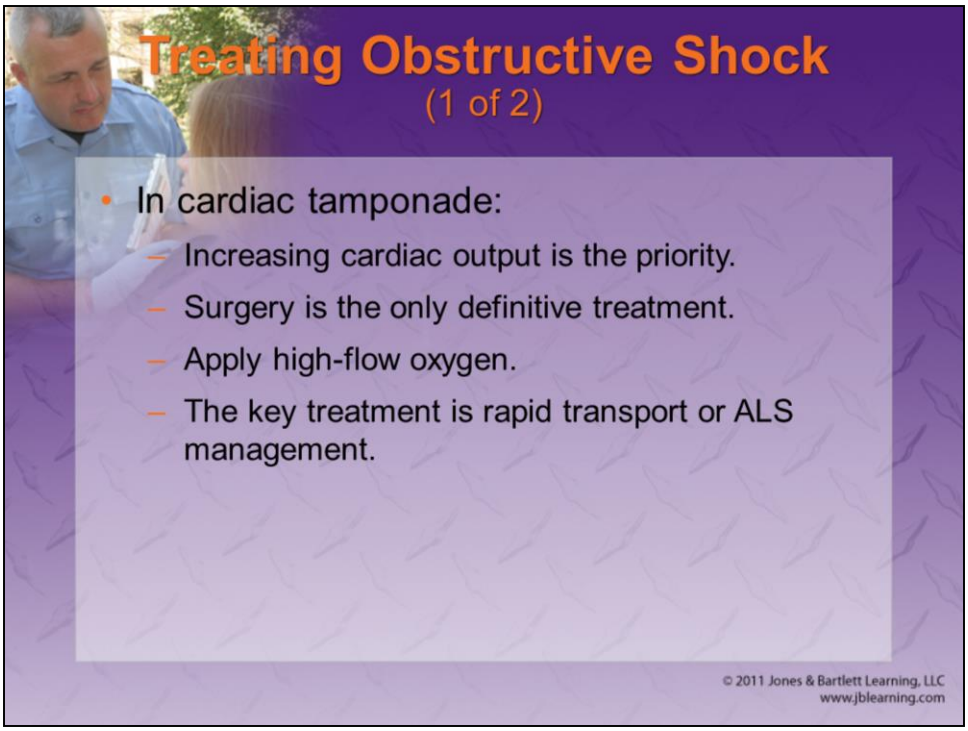
- Patient does not require a transfusion of blood, IV fluids, or elevation of legs.
- Chronic lung disease will aggravate cardiogenic shock.
- Patient is able to breathe better in a sitting or semisitting position.

Treating Cardiogenic Shock
(2 of 3)

- Before administering nitroglycerin, consult with medical control.
- Patients usually have a low blood pressure, weak/irregular pulse, cyanosis, anxiety, and nausea.
- Place the patient in a position that eases breathing as you give high-flow oxygen.

Treating Cardiogenic Shock
(3 of 3)

- Assist ventilations as necessary and have suction nearby in case the patient vomits.
- Provide prompt transport.
- Approach a patient with a suspected heart attack with calm reassurance.


Treating Obstructive Shock
(1 of 2)
• In cardiac tamponade:
– Increasing cardiac output is the priority.
– Surgery is the only definitive treatment.
– Apply high-flow oxygen.
– The key treatment is rapid transport or ALS management.
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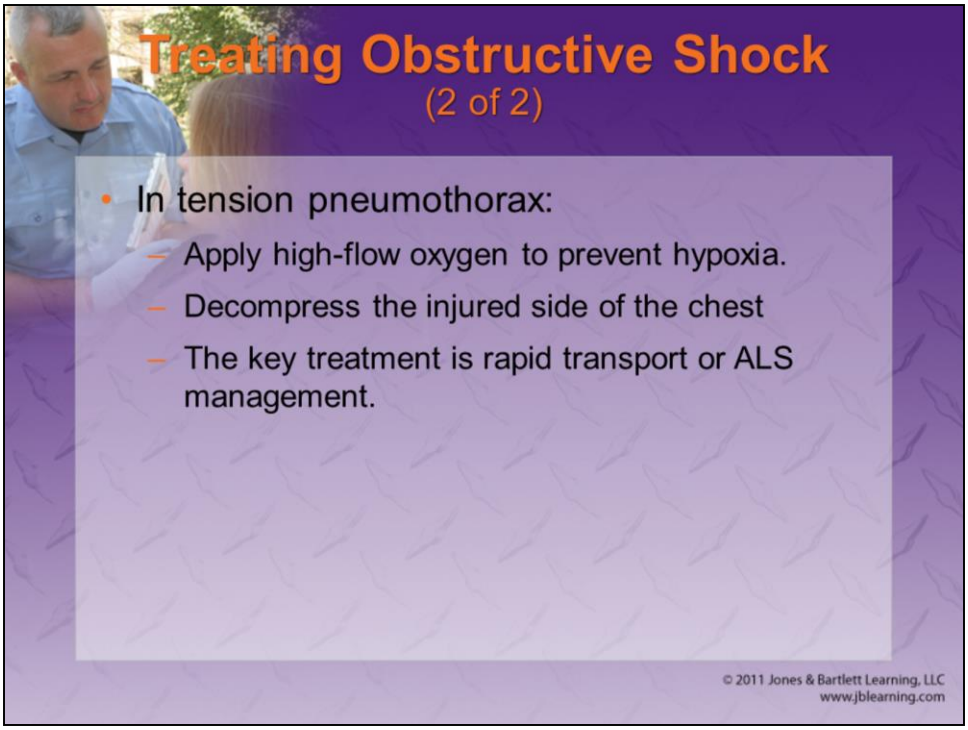
Treating Obstructive Shock
(2 of 2)
• In tension pneumothorax:
– Apply high-flow oxygen to prevent hypoxia.
– Decompress the injured side of the chest
– The key treatment is rapid transport or ALS management.
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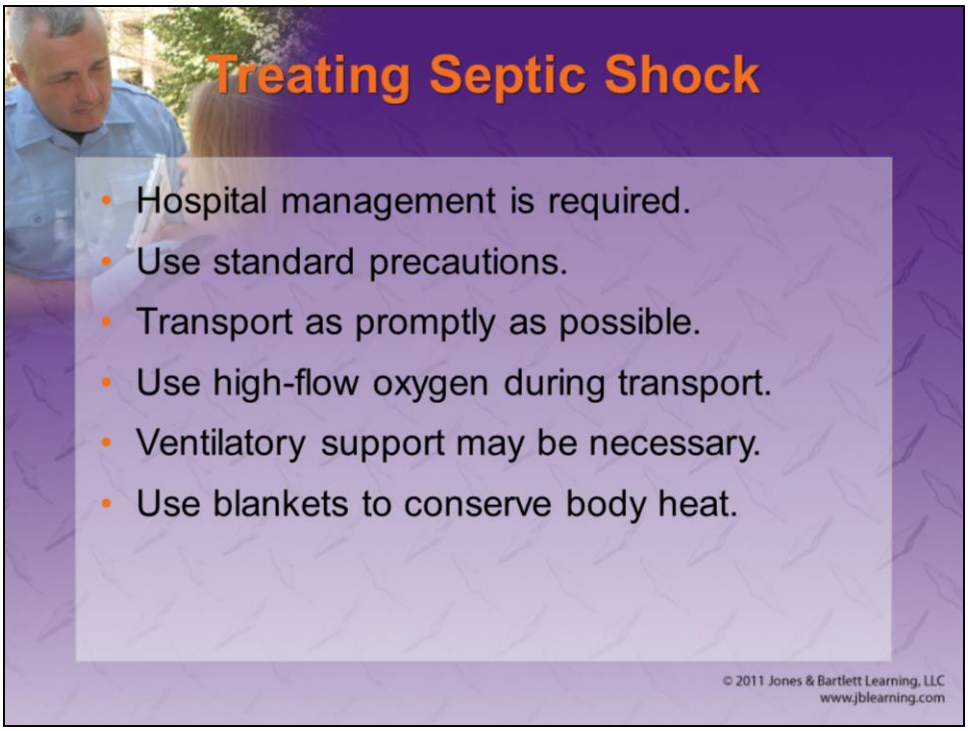
Treating Septic Shock
• Hospital management is required.
• Use standard precautions.
• Transport as promptly as possible.
• Use high-flow oxygen during transport.
• Ventilatory support may be necessary.
• Use blankets to conserve body heat.
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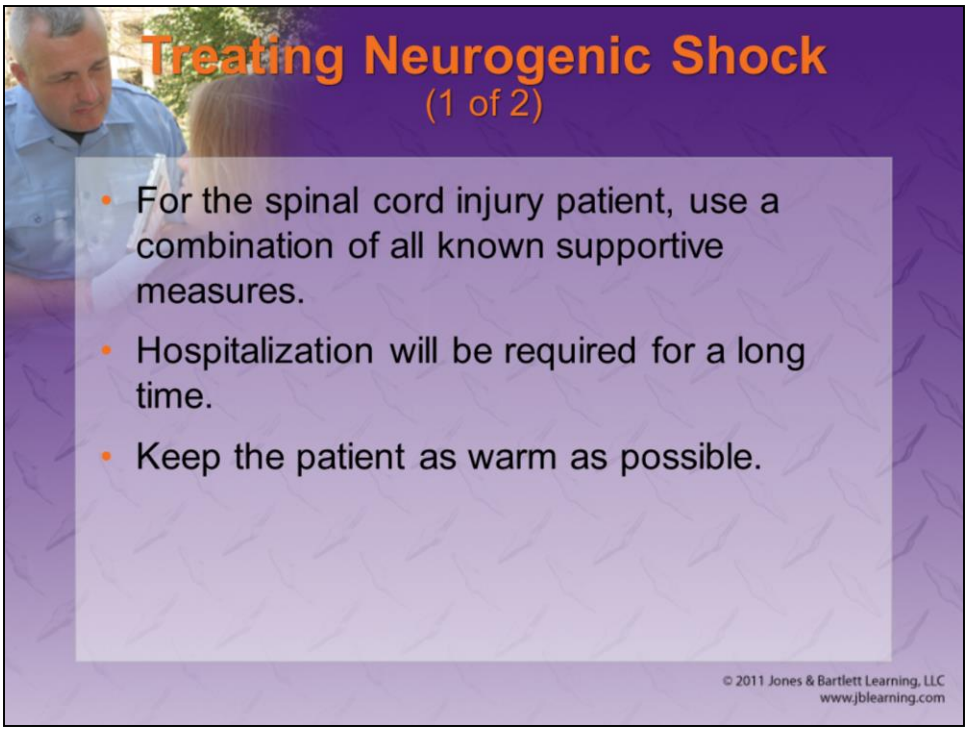
Treating Neurogenic Shock
(1 of 2)
• For the spinal cord injury patient, use a combination of all known supportive measures.
• Hospitalization will be required for a long time.
• Keep the patient as warm as possible.
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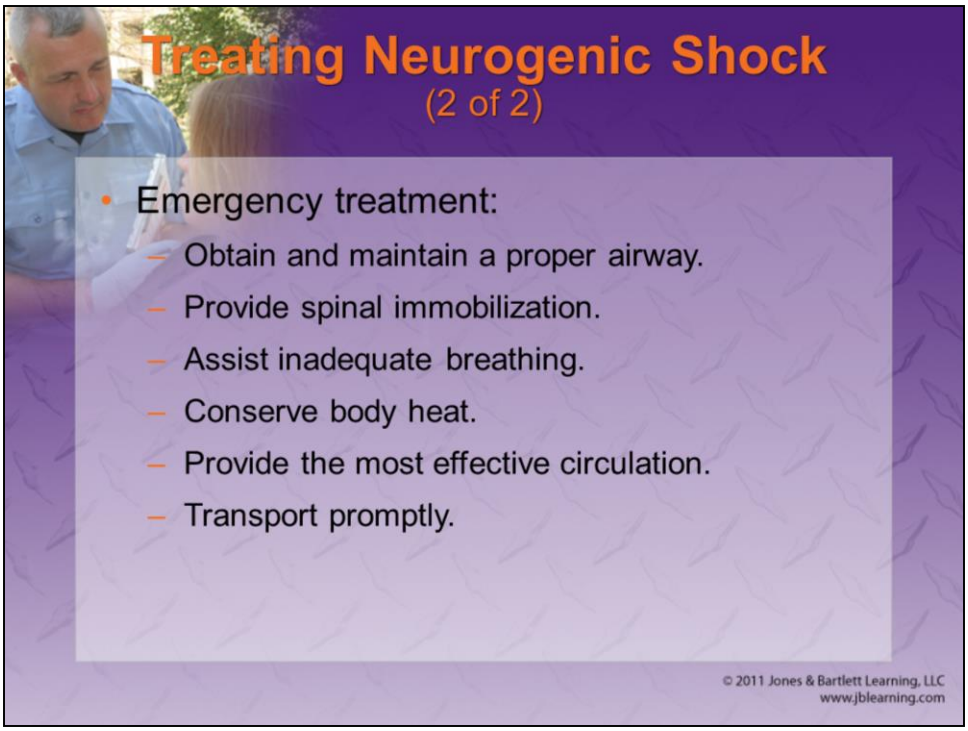
Treating Neurogenic Shock
(2 of 2)
• Emergency treatment:
– Obtain and maintain a proper airway.
– Provide spinal immobilization.
– Assist inadequate breathing.
– Conserve body heat.
– Provide the most effective circulation.
– Transport promptly.
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Treating Anaphylactic Shock

- Administer epinephrine.
- Promptly transport the patient.
- Provide supplemental 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 uncomplicated 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 after regaining consciousness, the patient is unable to walk normally, suspect head injury.
  - Transport the patient promptly.
  - Record all initial observations of vital signs and level of consciousness.

Treating Hypovolemic Shock

- Control all obvious external bleeding.
- Splint any bone and joint injuries.
- 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 bag-mask device.
- Give supplemental oxygen.
- Transport the patient promptly.

Summary (1 of 5)

- Perfusion requires an intact cardiovascular system and a functioning respiratory system.
- Most types of shock are caused by dysfunction in the heart, blood vessels, or volume of blood.

Summary (2 of 5)

- Shock is the collapse and failure of the cardiovascular system, when blood circulation slows and eventually stops.
- Blood is the vehicle for carrying oxygen and nutrients through the vessels to the capillary beds to tissue cells, where these supplies are exchanged for waste products.

Summary (3 of 5)

- Blood contains red blood cells, white blood cells, platelets, and a liquid called plasma.
- The *systolic* pressure is the peak arterial pressure.
- The *diastolic* pressure is the pressure maintained within the arteries while the heart rests between heartbeats.

Summary (4 of 5)

- The various types of shock are cardiogenic, obstructive, septic, neurogenic, anaphylactic, psychogenic, and hypovolemic.
- If there is any question on your part, treat for shock. It is never wrong to treat for shock.

Summary (5 of 5)

- Remember, by the time a drop in blood pressure is detected, shock is usually in an advanced stage.
- Treating a pediatric or geriatric patient in shock is no different than treating any other shock patient.

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.

Review

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.

Review

Answer: A

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.

Review

Answer: D

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.

Review

Answer: C

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.

Review

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.

Review

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.

Review

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.

Review

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

Review

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. Perfusion is the circulation of blood in:
    A. adequate amounts.
    B. inadequate amounts.
    C. excessive amounts.
    D. the brain.

Review

Answer: A

Rationale: Perfusion is the circulation of blood within organs and tissues in adequate amounts to meet the cells' current needs.

Review

10. Perfusion is the circulation of blood in:
    A. adequate amounts.
    Rationale: Correct answer
    B. inadequate amounts.
    Rationale: Perfusion is the circulation of blood in adequate amounts.
    C. excessive amounts.
    Rationale: Perfusion is the circulation of blood in adequate amounts.
    D. the brain.
    Rationale: Perfusion is the circulation of blood in organs and tissues.

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