Chapter 12
Shock

Shock
● Shock: ____________________ perfusion
● State of collapse and failure of the cardiovascular system
● Leads to inadequate circulation
● Without adequate blood flow, cells cannot get rid of metabolic wastes
● Results in ____________________ to cells that causes the organ, then organ systems, to fail
● In the early stages, the body attempts to maintain homeostasis

Shock
Shock can occur because of medical or traumatic events:
● Heart attack
● Severe allergic reaction
● Automobile crash, ____________________, other major trauma

Causes of Shock
“The Perfusion Triangle” (1 of 2)
Heart (Pump Function)
● Damage to the heart by disease or injury.
● It cannot move ____________________ adequately to support perfusion.

Blood Vessels (Container Function)
● If all the vessels dilate at once, the normal amount of blood ____________________ is not enough to fill the system and provide adequate perfusion to the body.

Causes of Shock
“The Perfusion Triangle” (2 of 2)
Blood (Content Function)
● If blood or plasma is lost, the ____________________ in the container is not enough to support the perfusion needs of the body.

Systemic Circulation
The Perfusion Triangle
Causes of Shock (1 of 3)
Causes of Shock (2 of 3)
- Pump Failure
  - _________________ Shock
  - Obstructive Shock
- Poor Vessel Function (Distributive Shock)
  - Septic Shock
  - Neurogenic Shock
  - _________________ Shock
  - Psychogenic Shock

Causes of Shock (3 of 3)
- Low Fluid Volume (Hypovolemic Shock)
  - _________________ Shock
  - Nonhemorrhagic Shock

Blood Pressures
- 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
- Pulse pressure is the difference between the systolic and diastolic pressures.

Blood Flow
- Blood flow through the _________________ 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

Perfusion
- Perfusion requires more than just having a working _________________ system.
Working system.

– Adequate oxygen exchange in the lungs
– Adequate nutrients in the form of ______________________ in the blood
– Adequate waste removal, primarily through the lungs

14 □ Pump Failure Causes of Shock

15 □ Cardiogenic Shock
● Pump failure
● Inadequate function of the heart or pump failure
● Causes a ______________________ of blood into the lungs
● Results in pulmonary edema
● Pulmonary edema leads to impaired ventilation
● Develops when the heart cannot maintain sufficient output to meet the demands of the body

16 □ Obstructive Shock
● Obstructive shock occurs when conditions that cause____________________ obstruction that prevents an adequate volume of blood from filling the heart chambers
● Common examples include cardiac tamponade, tension pneumothorax, and pulmonary embolism.
● These conditions discussed later in course

17 □ Distributive Causes of Shock

18 □ Distributive Shock
● Results when there is widespread ______________________ of the small arterioles, small venules, or both
● Blood volume pools in the expanded vascular beds and perfusion decreases
● Septic shock, neurogenic shock, ______________________ shock, and psychogenic shock

19 □ Septic Shock
● Results from ______________________
● Combined vessel and content failure
● Some patients with severe bacterial infections, toxins, or infected
Some patients with severe bacterial infections, toxins, or infected tissues contract septic shock.

- Toxins damage vessel walls, causing leaking and impairing ability to contract.
- Leads to dilation of vessels and loss of plasma, causing shock.

20 Neurogenic Shock
- Poor vessel function
- Damage to the _______________________ spine may affect control of the size and muscular tone of blood vessels.
- The vascular system increases
- Blood in the body cannot fill the enlarged system

21 Perfusion and Neurogenic Shock

22 Anaphylactic Shock (1 of 2)
- Severe _______________________ Reaction
- 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.

23 Anaphylactic Shock (2 of 2)
- Each subsequent exposure tends to produce a more severe reaction.
- Four categories of common causes:
  - Injections
    - _______________________
  - Ingestion
  - Inhalation

24 Psychogenic Shock
- Caused by sudden reaction of the _______________________ system that produces a temporary, generalized vascular dilation
- Commonly referred to as fainting or syncope
- Can be brought on by serious causes: irregular heartbeat, brain aneurysm
- Can be brought on by causes ranging from fear or bad news to unpleasant sights
Low Fluid Volume Shock

Hypovolemic Shock (1 of 2)
- Content failure
- Results from fluid or________________________loss
- Hemorrhagic Shock is loss of blood
- Nonhemorrhagic shock is loss of body fluids such as diarrhea and vomiting
- Blood is lost through external and internal bleeding.
- Severe thermal burns cause________________________loss.

Hypovolemic Shock (2 of 2)
- Dehydration can cause or aggravate shock.
- Very young and________________________are most susceptible to dehydration
- Dehydration can lead to hypovolemic shock and can lead to death

Respiratory Insufficiency

Respiratory Insufficiency
- AKA Respiratory Shock
- Patient with a severe chest injury or airway obstruction may be unable to breathe in adequate amounts of oxygen.
- Insufficient________________________in the blood will produce shock.
- Multiple medical causes
- Anemia can lead to tissue hypoxia because there are not enough red blood cells to deliver adequate amounts of oxygen to the cells.

Respiratory Insufficiency
- Certain types of poisoning may affect the ability of cells to metabolize or carry oxygen:
  - Carbon monoxide poisoning
  - __________________________poisoning

Progression of Shock
- Compensated shock
  - When the body________________________for blood loss
- Decompensated shock
  - The late stage of shock when blood pressure is falling and the body cannot compensate
- Irreversible shock
  - The terminal stage that results in death

### Progression of Shock
- Blood pressure may be the last measurable factor to change in shock.
  - When a ________________ in blood pressure is evident, shock is well developed.
  - Particularly true in infants and children
- Expect shock in many emergency medical situations

### S/S of Compensated Shock
1. Agitation
2. Anxiety
3. Restlessness
4. Feeling of ________________ doom
5. Altered mental status
6. Weak pulse
7. Clammy skin
8. Pallor
9. Shallow, rapid breathing
10. Shortness of breath
11. ________________ or vomiting
12. Delayed capillary refill
13. Marked thirst

### S/S of Decompensated Shock
1. Falling blood ________________ (systolic <90mmHg in adults)
2. Labored, irregular breathing
3. Ashen, mottled, cyanotic skin
4. Thready or absent pulse
5. Dull eyes, dilated pupils
6. Poor urinary output
35 S/S of Irreversible Shock
- This is the terminal stage of shock.
- A transfusion of any type will not be enough to save a patient’s life.

36 When to Expect Shock
- Multiple severe fractures
- ______________________ or chest injuries
- Spinal injuries
- Severe infection
- Major heart attack
- Anaphylaxis

37 General Emergency Care (1 of 2)
- Make certain patient has open airway.
- Keep patient supine.
- Control ______________________ bleeding.
- Splint any broken bones or joint injuries.

38 General Emergency Care (2 of 2)
- Always provide oxygen.
- Splint any broken bones or joint injuries
- Place ______________________ under and over patient.
- Do not give the patient anything by mouth.

39 Treating Cardiogenic Shock
- The heart cannot pump blood throughout the circulatory system.
- Chronic lung disease will aggravate cardiogenic shock.
- Patients in cardiogenic shock should not receive_________________; they are hypotensive

40 Treating Cardiogenic Shock
- Patient may breathe better in a sitting or semi-sitting position.
- Administer high-flow oxygen.
- Assist ______________________ as necessary.
- Have suction nearby in case the patient vomits.
- Transport promptly.
41  **Treating Obstructive Shock**
   - For cardiac tamponade:
     - Increasing cardiac output is the priority.
     - Apply high-flow oxygen.
     - Surgery is the only definitive treatment.

42  **Treating Obstructive Shock**
   - For tension pneumothorax:
     - Apply high-flow oxygen to prevent hypoxia.
     - Chest __________________________ is required.
     - Ask for ALS early in call if available, but do not delay transport.

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

44  **Treating Neurogenic Shock**
   - Emergency treatment:
     - Obtain and maintain a proper airway.
     - Provide __________________________ immobilization.
     - Assist inadequate breathing.
     - Conserve body heat.
     - Ensure the most effective circulation possible.
     - Transport promptly.
   - Neurogenic shock victims will have skin that is warm and dry

45  **Treating Anaphylactic Shock**
   - Administer __________________________.
   - Promptly transport the patient.
   - Provide high-flow oxygen and ventilatory assistance en route.
   - A mild reaction may worsen suddenly or over time.
Consider requesting ALS backup, if available.

Treating Psychogenic Shock
- It is usually self-resolving.
- Assess patient for ________________ from fall.
- If patient has difficulties after regaining consciousness, suspect another problem.
  - Transport the patient promptly
  - All patients with loss of consciousness should be transported for evaluation

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

Treating Respiratory Shock
- Secure and support the airway.
- Clear airway of any obstructions.
- Ventilate if needed with a BVM device.
- Administer oxygen.
- Transport promptly.

Treating Shock in Older Patients
- Older patients have more serious complications than do younger ones.
- Illness is not just a part of aging.
- Many older patients take __________________ that mask or mimic signs of shock.
- Treating an older patient in shock is no different than treating any other shock patient.

Key Points to Remember
- Agitation, restlessness, and anxiety are normally the first signs of
Agitation, restlessness, and anxiety are normally the first signs of shock. A falling BP is a ____________ sign of shock. Some types of shock have no blood loss. Not all shock produces diaphoresis and rapid heart rate (ex: Neurogenic Shock).