Patient Care

Medical Radiologic Technology Program

Definition of Shock

- Shock is a general term used to describe a failure of circulation in which blood pressure is inadequate to support the oxygen perfusion of vital tissues and is unable to remove the by-products of metabolism.

- Shock is a dangerous, potentially fatal condition.

Different Types of Shock

1. Hypovolemic
2. Septic
3. Neurogenic
4. Cardiogenic
5. Allergic or Anaphylactic

Hypovolemic Shock(Low Volume)

- Occurs when a large amount of blood or plasma has been lost, leaving an insufficient amount of fluid in the circulatory system.

- Caused by:
  - External hemorrhage
  - Lacerations
  - Plasma loss from burns
  - Internal bleeding from trauma or perforated gastric ulcer

Hypovolemic Shock (cont'd)

- Also can be caused by severe dehydration from vomiting, diarrhea or extreme diuresis.

- Treatment options include:
  - Fluid replacement for low-volume shock (i.e., saline or blood)
  - Administration of oxygen
  - Medication to promote vasoconstriction

Septic Shock

- When a massive infection occurs in the body.

- Gram-negative bacteria is the most common causative organisms to cause septic shock. However, gram positive bacteria and viruses can be the cause. The body begins the immune response by releasing chemicals that increase capillary permeability and vasodilation.

- There are two phases of clinical manifestations of septic shock:

1) First phase and 2) Second phase.

Septic shock continued

Signs and symptoms of First phase include:

-Hot, dry and flushed skin
-Increase in hear rate and respiratory rate
-Fever, but possibly not in the elderly patient
-Nausea, vomiting and diarrhea
-Normal to excessive urine output
-Possible confusion

Signs and Symptoms of Second Phase include:

-Cool, pale skin

-Normal temperature

-Drop in BP

-Rapid heart rate and respiratory rate

-Anuria

-Seizures and organ failure

Radiographers will encounter Septic shock in ICU or in ER department. A portable x-ray will be performed.

Neurogenic Shock

- The failure of arterial resistance, causing a pooling of blood in peripheral vessels.

- Causes include:
  - Injury to the nervous system
  - Reaction to medication

- It's an acute situation that demands immediate intervention.

Neurogenic Shock (cont'd)

- Patients with spinal and head injuries are the most common with this type of shock.

- Signs and symptoms include:
  - Warm, dry skin
  - Bradycardia
  - Hypotension
  - Diminishing peripheral pulses, cool extremities

- Monitor pulse, respiration and BP every 5 minutes. With head/spinal injuries monitor BP closely looking for changes.

Cardiogenic Shock

- Results from cardiac failure of heart to pump an adequate amount of blood to the vital organs.

- The onset may occur over a period, or it may be sudden. The most vulnerable patients include those with: *myocardial infarction, dysrhythmias or other cardiac pathology.*

Cardiogenic Shock

Clinical Manifestations include:

- Compliant of chest pain that may radiate to jaws and arms
- Dizziness and respiratory distress
- Cyanosis
- Restlessness and anxiety
- Rapid change in LOC
- Pulse may be irregular and slow; may have tachycardia and tachypnea
- Decreasing BP
- Decreasing urinary output
- Cool, clammy skin

Allergic or Anaphylactic Shock

- The most common causes of anaphylaxis are *medications, iodinated contrast media and insect venoms.*
- Signs and symptoms will depend whether it's a mild/moderate or severe reaction.
- Usually, the more abrupt the onset of anaphylaxis, the more severe the reaction will be. Example-large bolus injection of contrast media.

Anaphylactic Shock

- Most frequently seen type of shock in radiographic imaging.

- Anaphylactic shock is the result of an exaggerated hypersensitivity reaction. When this occurs, histamine and bradykinin are released, causing widespread vasodilatation, which results in peripheral pooling of blood.
- This response is accompanied by contraction of nonvascular smooth muscles, particularly the smooth muscles of the respiratory tract

Allergic Shock (cont'd)

Mild to moderate contrast media reactions include:

- Itchy skin (rash)
- Urticaria (hives)
- Nasal congestion, sneezing, watery eyes
- Coughing with possible laryngeal swelling
- Peripheral tingling
- Tachycardia (> 100 beats/min) or Bradycardia (< 60 beats/min)
- Hypotension
- Feeling of fullness or tightness of chest, mouth or throat
- Feeling of anxiety or nervousness

Allergic Shock (cont'd)

Severe contrast media reactions include:

- Abrupt onset of symptoms
- Bradycardia (< 50 beats/min)
- Hypotension (decrease in BP—systolic BP < 80mm Hg)
- Severe dyspnea
- Cardiac arrhythmias
- Laryngeal swelling
- Possible convulsions/seizures
- Loss of consciousness
- Respiratory arrest or cardiac arrest

Response to anaphylactic shock

1. Do not leave the patient, Stop any infusion or injection of contrast immediately, however you MUST maintain the IV line for medication access.
2. Notify the radiologist or ER physician (check site's protocol)
3. If patient complains of respiratory distress or has any of the symptoms listed in the severe reaction section- call the Code Team
4. Place patient in semi-Fowler position or sitting position to facilitate respiration if possible

Response continued

5. Monitor pulse, respiration and blood pressure every 5 minutes until Code team arrives or the physicians orders state otherwise.

6. Prepare oxygen, intravenous fluids and medication administration (drug box or crash cart)

7. Always keep track of the time and sequence of events in order to document.

Preventing Shock

- Avoid sudden changes in temperature—keep patient warm.
- Reduce pain and stress. Handle patients gently and with care.
- Reduce anxiety. Work in a calm, confident manner. Reassure the patient. Listen to their concerns and answer questions.

Recognizing Shock

- Sense of apprehension
- May be restless
- Change in ability to think
- Change in skin appearance/colour
- Pallor accompanied by weakness
- Increased pulse rate
- A drop in BP of 30 mm HG below the baseline systolic pressure
- Decrease in urination
- Increased and shallow respirations

Technologist's Responsibility

If your patient is going into shock what should you do?

1. Stop the procedure. Assist the patient to a dorsal recumbent position to avoid a fall.
2. Elevate feet to increase blood flow to brain.
3. Obtain help. If in doubt, call a code. It's better to be mistaken than to have patient die because of inadequate treatment.
4. Check BP and assist the dyspneic (breathless, air-hungry) patient with O_2.
5. Be ready to assist code team and document events.