

# MANAGE SHOCK CASUALTIES



# OVERVIEW



- Cardiovascular System Terminology
- Anatomy Cardiovascular System
- Types of Shock
  - Signs & Symptoms
  - Treatment



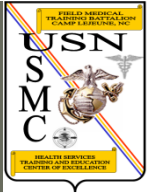
# LEARNING OBJECTIVES

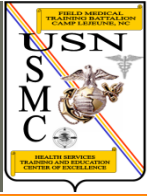
Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives





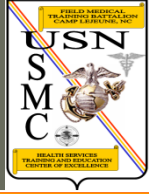
# TERMINOLOGY



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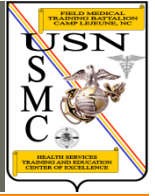


- Overview
- Shock is regarded as a state of generalized cellular hypoperfusion in which delivery of oxygen to the cells is inadequate to meet metabolic needs.
- There is no laboratory test to diagnose shock.
- The initial step is to recognize its presence.
- By far, the most common cause of shock in the trauma casualty is hemorrhage.



# TERMINOLOGY

- Systolic Blood Pressure
  - force of the blood against vessels produced by ventricular contraction
  - Normal Systolic BP = 120 –140 mmHg
- Diastolic Blood Pressure
  - pressure in vessels while the heart is at rest
  - Normal Diastolic BP = 60 – 80 mmHg



# MEDICAL TERMINOLOGY

- Preload
  - amount of blood returning into the heart from the systemic circulatory system
- Afterload
  - resistance to blood flow the heart must overcome to pump blood
- Stroke Volume
  - amount of blood pumped by the heart with each contraction
- Capillary Refill Test
  - Indicative of tissue perfusion



# TERMINOLOGY



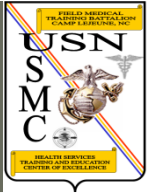
- Nervous System (2 components)
  - Sympathetic
    - Fight or flight response
    - Goal is to maintain sufficient amount of oxygenated blood to critical areas
  - Parasympathetic
    - Rest and digest
    - Maintains normal body functions



# TERMINOLOGY

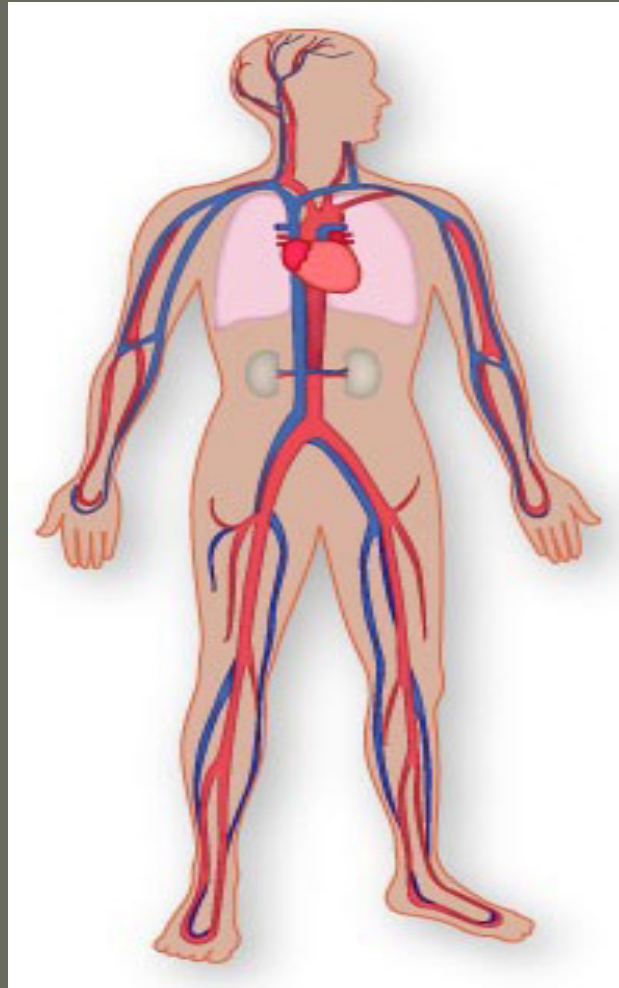
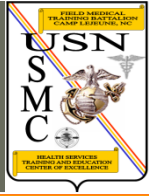


- Metabolism
  - Aerobic Metabolism
    - Body's principle energy process
    - Uses oxygen as power source
  - Anaerobic Metabolism
    - Back-up power system
    - Uses stored body fat
    - \*\*Ultimate cause of death in shock casualties\*\*



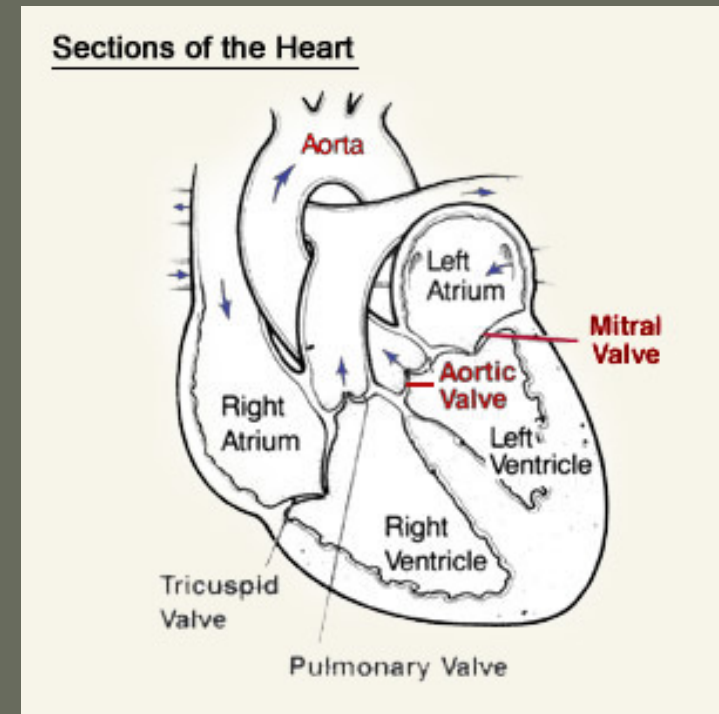


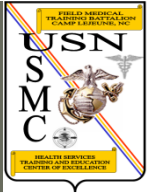
# CARDIOVASCULAR ANATOMY



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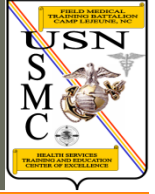
- Shock occurs from failure of any one or more of the cardiovascular components:
  - Pump: Heart
  - Fluid: RBC, WBC, Platelets
  - Container: Arteries, Veins, and Capillaries







# TYPES OF SHOCK

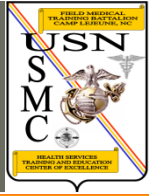


## 3 Types of Shock

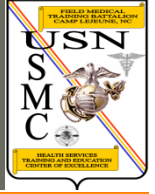
- 1- Hypovolemic
- 2- Distributive
- 3- Cardiogenic



# HYPOVOLEMIC SHOCK



- Definition: Loss of body fluids from dehydration, burns, or hemorrhage. The container has retained its normal size but the fluid volume is decreased.
- Hemorrhagic shock is the most common form of hypovolemic shock in a tactical situation.
- On the battlefield, assume all shock, until proven otherwise, is hemorrhagic shock.



# HYPOVOLEMIC SHOCK

- Signs and Symptoms
  - Signs and symptoms of hemorrhagic shock are linked to the amount of blood lost and the body's reaction to it.
  - **DO NOT rely on B/P as the primary indicator**
  - To accurately assess for shock, pay close attention to:
    - Mental status of casualty
    - Quality of distal pulses
    - Heart rate



# HYPOVOLEMIC SHOCK



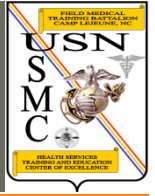
Hemorrhagic shock can be divided into four classes:

## Class I Shock

Minimal affects, no significant clinical findings



# HYPOVOLEMIC SHOCK



- Class II Shock
  - Casualty getting worse
  - Breathing faster, heart beating faster
  - Compensatory mechanisms are able to maintain B/P and perfusion



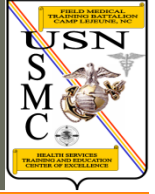
# HYPOVOLEMIC SHOCK



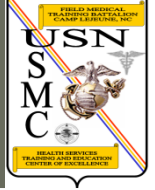
- Class III Shock
  - Unfavorable signs begin to appear
  - The body can not maintain adequate perfusion
  - Casualty is in significant trouble



# HYPOVOLEMIC SHOCK

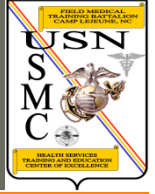


- Class IV Shock
  - Severe stage of shock
  - Even though blood volume may be restored and vital signs stabilized, death is imminent.
  - Survival depends on immediate hemorrhage control and aggressive resuscitation. May not be able to do in tactical situation.



# HYPOVOLEMIC SHOCK

- Treatment
  - STOP THE BLEEDING !!!!
    - LIFE THREATENING extremity hemorrhage, use tourniquet and/or hemostatic agents
    - LIFE THREATENING non-extremity hemorrhage, use direct pressure
  - Consider IV and fluid resuscitation
    - Remember- only  $\frac{1}{4}$ - $\frac{1}{3}$  of an isotonic crystalloid remains in the intravascular space 30-60 minutes after infusion.



# DISTRIBUTIVE SHOCK

- Definition: Shock that occurs when blood vessels enlarge without an increase in fluid volume.
- Causes: Spinal cord trauma, fainting, severe infections, and allergic reactions.

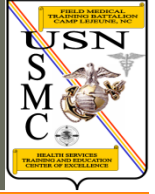


# DISTRIBUTIVE SHOCK



3 different types:

- **Septic**
- Neurogenic
- Psychogenic

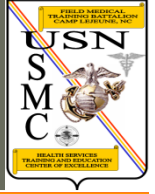


# SEPTIC SHOCK

- Cause
  - Severe, life threatening bacterial infection
  - Toxins cause blood vessels to dilate and plasma is lost through vessel walls, causing a loss in volume
  - Usually seen 5 – 7 days after initial trauma, so your focus is on prevention rather than treatment



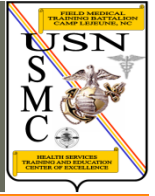
# SEPTIC SHOCK



- Signs and Symptoms
  - Hypotension
  - Fever
  - Cold, clammy skin
  - Pale, mottled skin color
  - Altered LOC
  - Slowed CAP refill



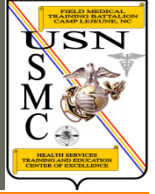
# SEPTIC SHOCK



- Treatment
  - Usually performed at higher level of care
  - Priority should be on TACEVAC
  - IV fluid therapy
  - IV antibiotic therapy (directed by MO)



# DISTRIBUTIVE SHOCK

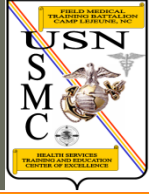


3 different types:

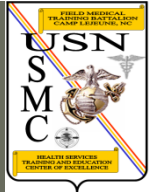
- Septic
- **Neurogenic**
- Psychogenic



# NEUROGENIC SHOCK



- Definition: Failure of the nervous system to control blood vessel diameter. Results in significant dilation of peripheral arteries.



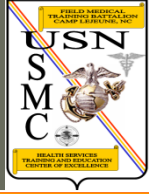
# NEUROGENIC SHOCK

- Causes
  - Brain or spinal cord injuries

- Signs & Symptoms

- Slow Heart Rate
  - Dry and warm skin
  - Hypotension
  - Injuries consistent with spinal injury

Bradycardia and hypotension not usually seen together so use this as a red flag!

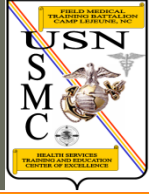


# NEUROGENIC SHOCK

- Treatment
  - Maintain ABC's
  - Spinal Immobilization
  - O2 therapy (if available)
  - Fluid resuscitation
  - Trendelenburg position
  - Keep patient warm
  - TACEVAC



# DISTRIBUTIVE SHOCK



3 different types:

- Septic
- Neurogenic
- **Psychogenic**



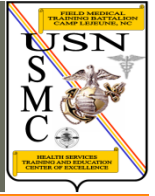
# PSYCHOGENIC SHOCK



- Sudden rapid dilation of blood vessels causing immediate drop in blood pressure and decreased perfusion to the brain
- AKA – vasovagal syncope or fainting
- Condition is considered temporary and self-correcting



# PSYCHOGENIC SHOCK



- Causes
  - Fear
  - Bad or upsetting news
  - Sight of blood or trauma



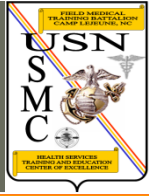
# PSYCHOGENIC SHOCK



- Signs and Symptoms
  - Fainting
  - Cool, clammy skin
  - Weakness
  - Altered LOC
  - Hypotension (briefly)



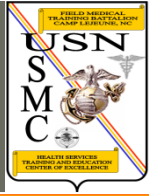
# PSYCHOGENIC SHOCK



- Treatment
  - Usually self limiting condition
  - Place patient in a horizontal position



# CARDIOGENIC SHOCK



- Shock caused by failure of heart to pump blood throughout the body. There is enough fluid (blood) filling the pump but there is something wrong with the pump.
- Causes may be:
  - Intrinsic (internal causes)
  - Extrinsic (external causes)



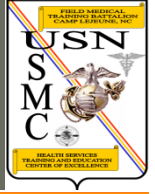
# CARDIOGENIC SHOCK



- Intrinsic Causes
  - Myocardial Infarction
  - Blunt injury to the heart



# CARDIOGENIC SHOCK



- Signs and Symptoms
  - Abnormal pulse rate/rhythm
  - Chest pain
  - Shortness of Breath
  - Nausea and Vomiting



# CARDIOGENIC SHOCK



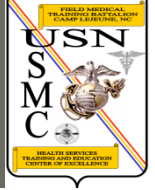
- Treatment
  - Maintain ABC's
  - Obtain IV access
  - Oxygen therapy (if available)
  - TACEVAC



# CARDIOGENIC SHOCK

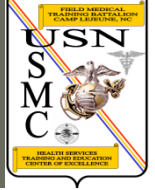


- Extrinsic Causes
  - Tension Pneumothorax
  - Cardiac Tamponade



# CARDIOGENIC SHOCK

- Tension Pneumothorax signs and symptoms
  - Obvious chest trauma
  - SOB
  - Tachycardia
  - Cyanosis
  - Absent lung sounds on affected side
  - JVD/Tracheal deviation (late sign)

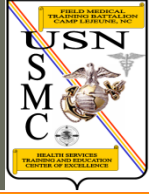


# CARDIOGENIC SHOCK

- Cardiac Tamponade signs and symptoms
  - Chest trauma
  - SOB/Dyspnea
  - Tachycardia
  - Cyanosis
  - Distant heart tones
  - Narrowing pulse pressure



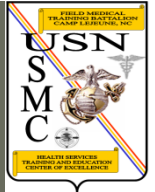
# CARDIOGENIC SHOCK



- Treatment
  - Maintain ABC's
  - O2, if available
  - TACEVAC
  - Needle Thoracentesis (for tension pneumothorax)



# VOLUME RESUSCITATION



Beneficial when three conditions exist:

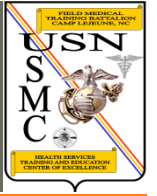
1. The casualty is bleeding at a rate of 25-100ml/ min.
2. The fluid administration rate is equal to the bleeding rate.
3. The scene time and transport time exceed 30 minutes
  - NEVER delay transport to start an IV



# VOLUME RESUSCITATION



You will receive training on the type of vascular access to start and the type of fluids to give in the lesson on Tactical Fluid Resuscitation





# MANAGE SHOCK CASUALTIES