Shock Part 1

- Medical Practice Improvement
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- Trauma Medical Director

Disclosures

- I have no disclosures

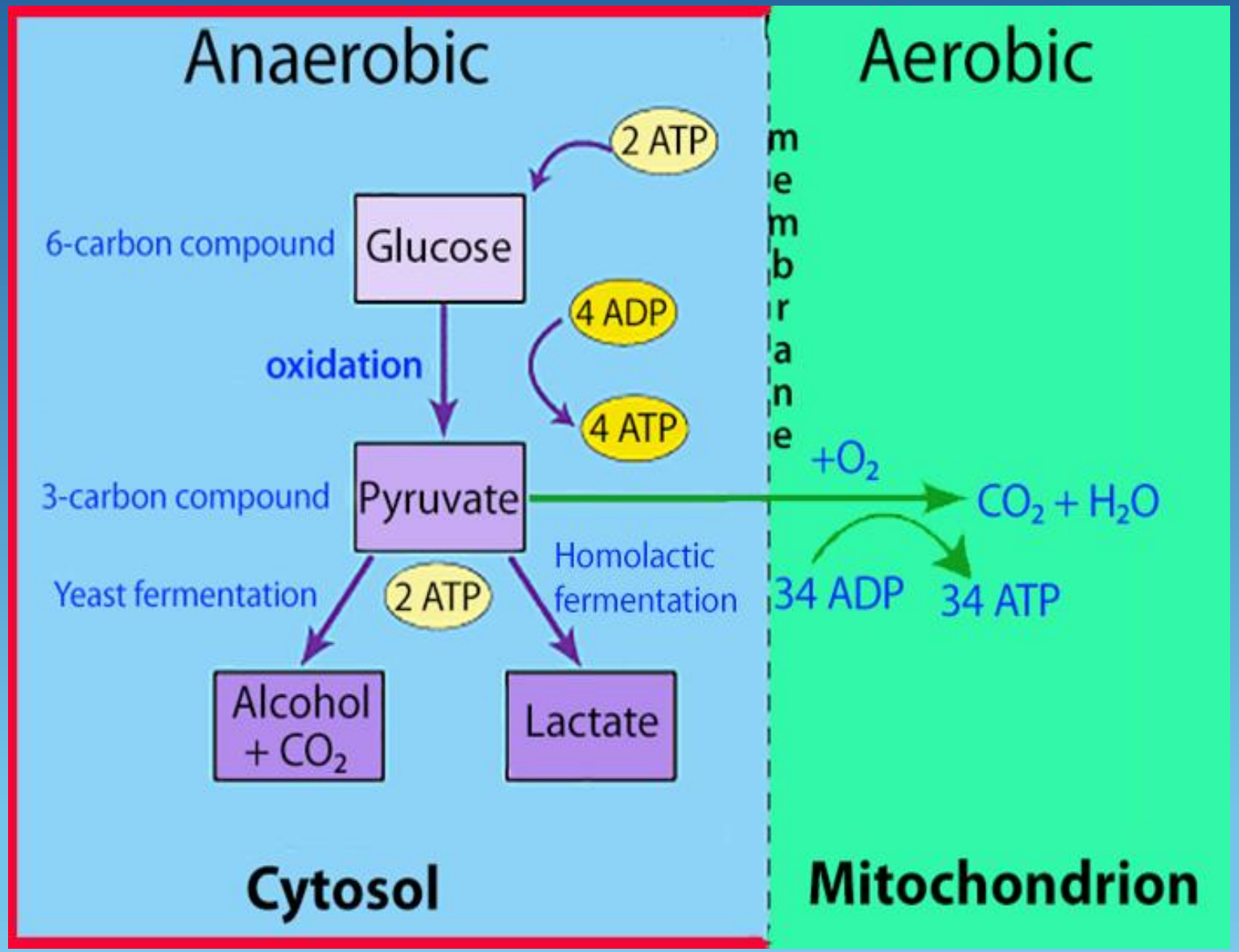
Learning Objectives

- 1. Introduction to shock
- 2. Introduction to monitoring devices
  - Arterial Line
  - CVP
  - Swan- Gantz catheter
  - Flo- Trac
- 3. Discuss the Classes of Shock

What is Shock?

- Defined as the lack of perfusion to one cell
  - Disruption of cellular respiration
  - No oxygen delivery
  - Then no Krebs cycle
  - Then you get Lactate and a proton H+ as waste product net 2 ATP
  - If there is oxygen, then it goes to Krebs cycle and the waste products are CO2 and H2O and 36 ATP

Anaerobic metabolism



What is the Point of Resuscitation?

- Restore Oxygen delivery to the tissues
  - Lactate washout
  - Lactate may go up initially once perfusion restored
    - Metabolized in liver
    - Takes 4-6 hours to metabolize
  - Base deficit will correct in real time
    - Protons are used up in the Krebs cycle and electron transport chain to make H2O

There are Only 5 Causes for Hypotension

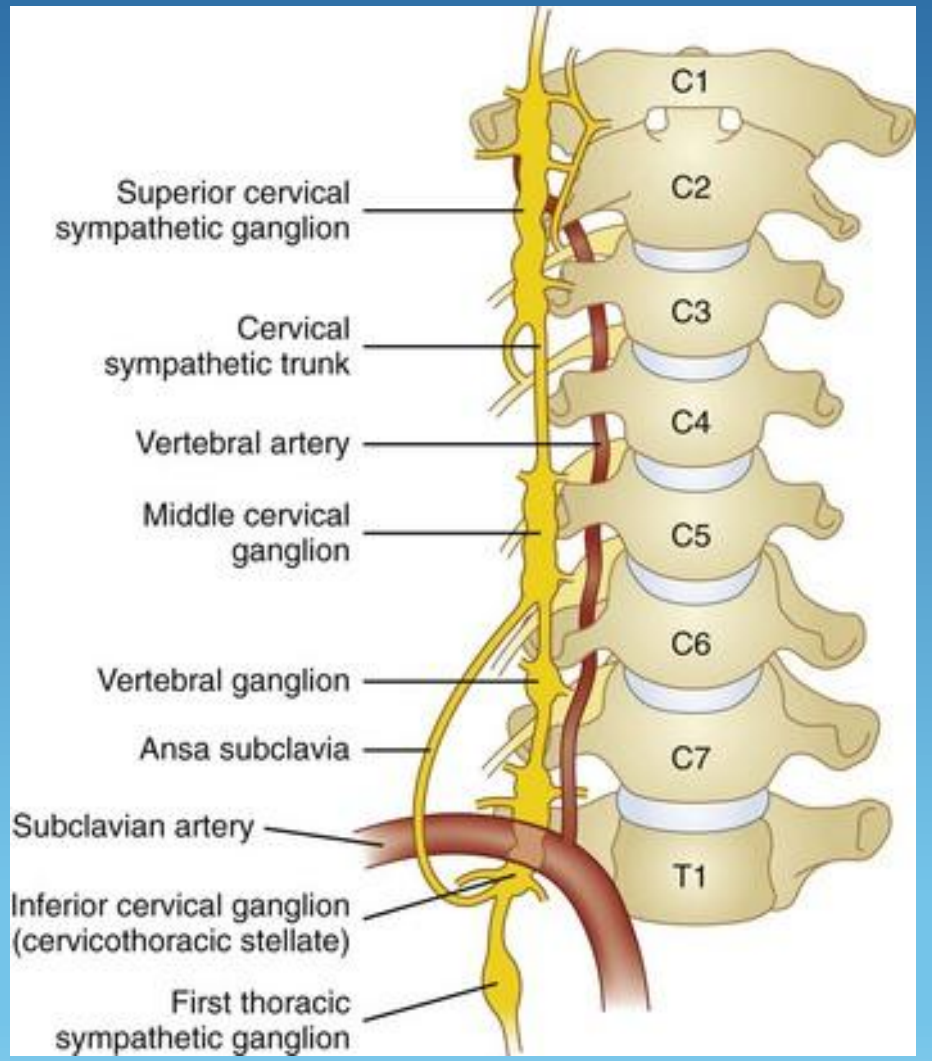
- Classes of Shock
  - Neurogenic Shock
  - Cardiogenic Shock
  - Obstructive Shock
  - Distributive Shock
    - Anaphylactic
    - Endocrine → adrenal insufficiency
  - Hypovolemic
    - Hemorrhagic

Neurogenic Shock

- Loss of Sympathetic tone from spinal cord injury above the level of T2

Symptoms

- Loss of sympathetic chain ganglion
- Hypotension and Bradycardia
- Paralysis
- Loss of sympathetic tone



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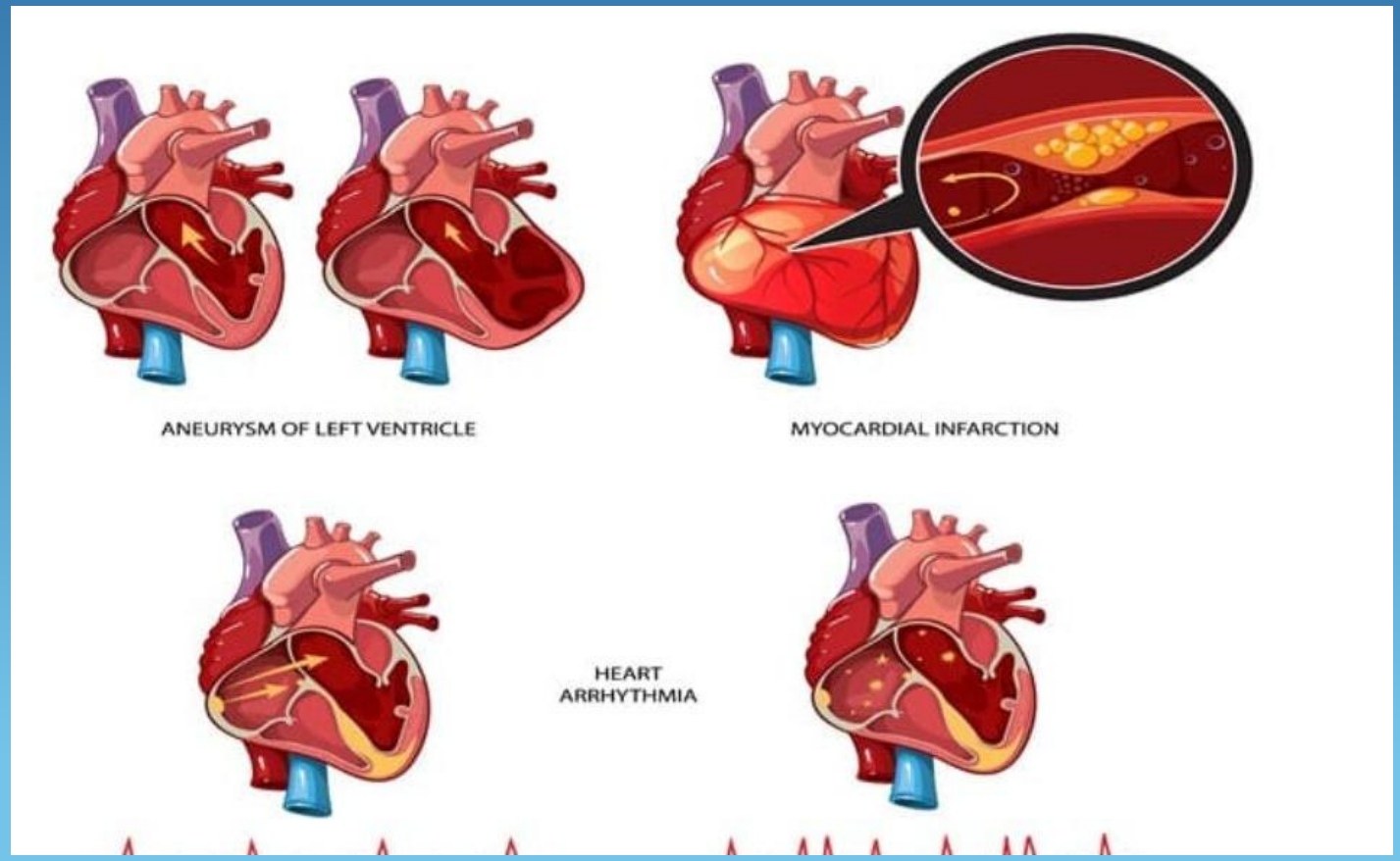
Cardiogenic Shock

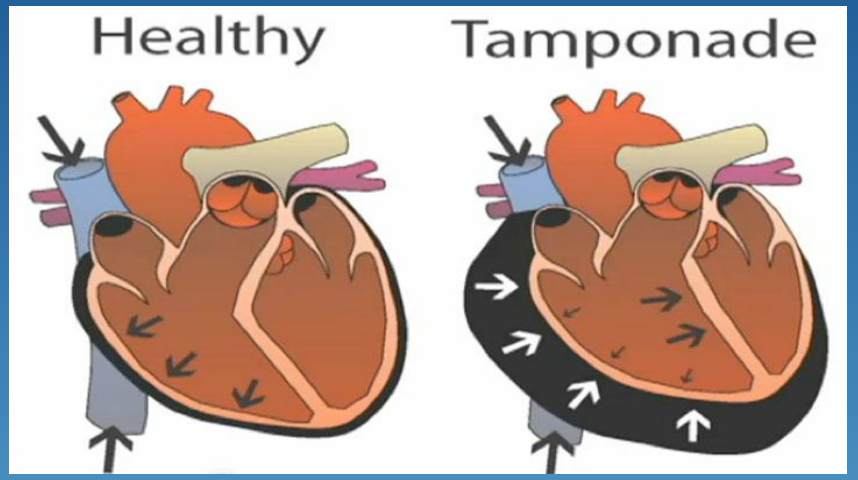
- Loss of cardiac function
- MI, ruptured Cordi tenanea, cardiac failure
- Hypotension
- Tachycardia
- Hypoxia

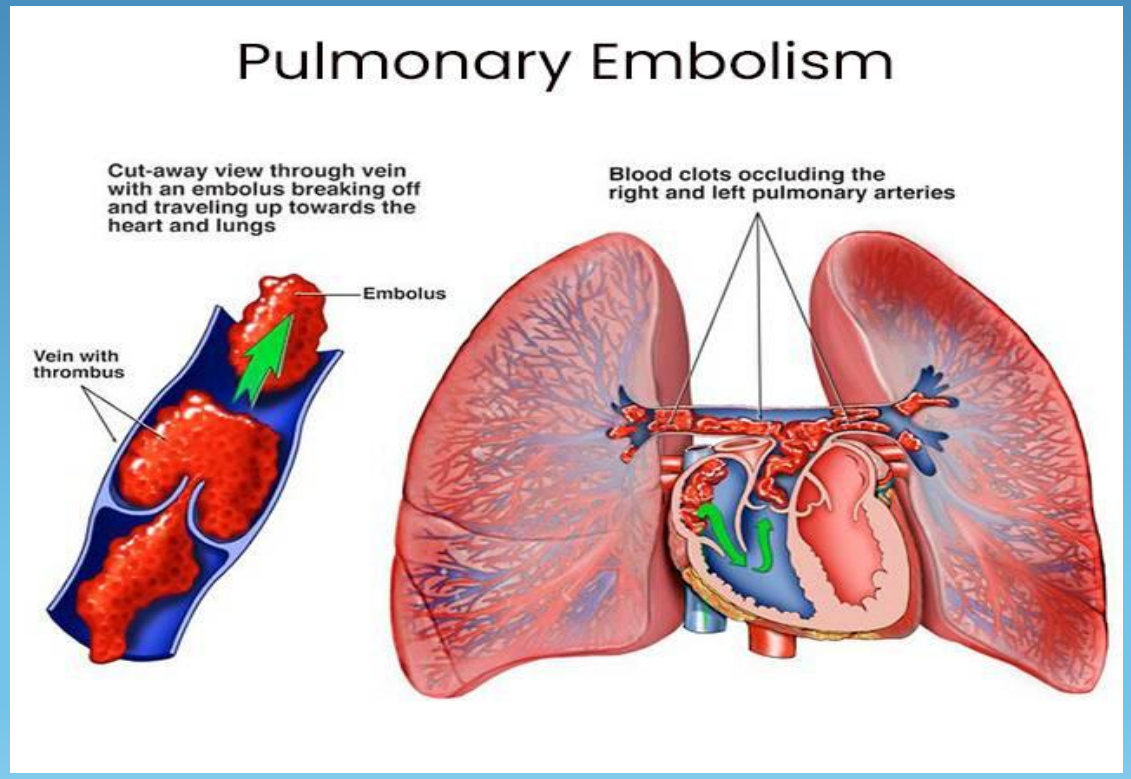


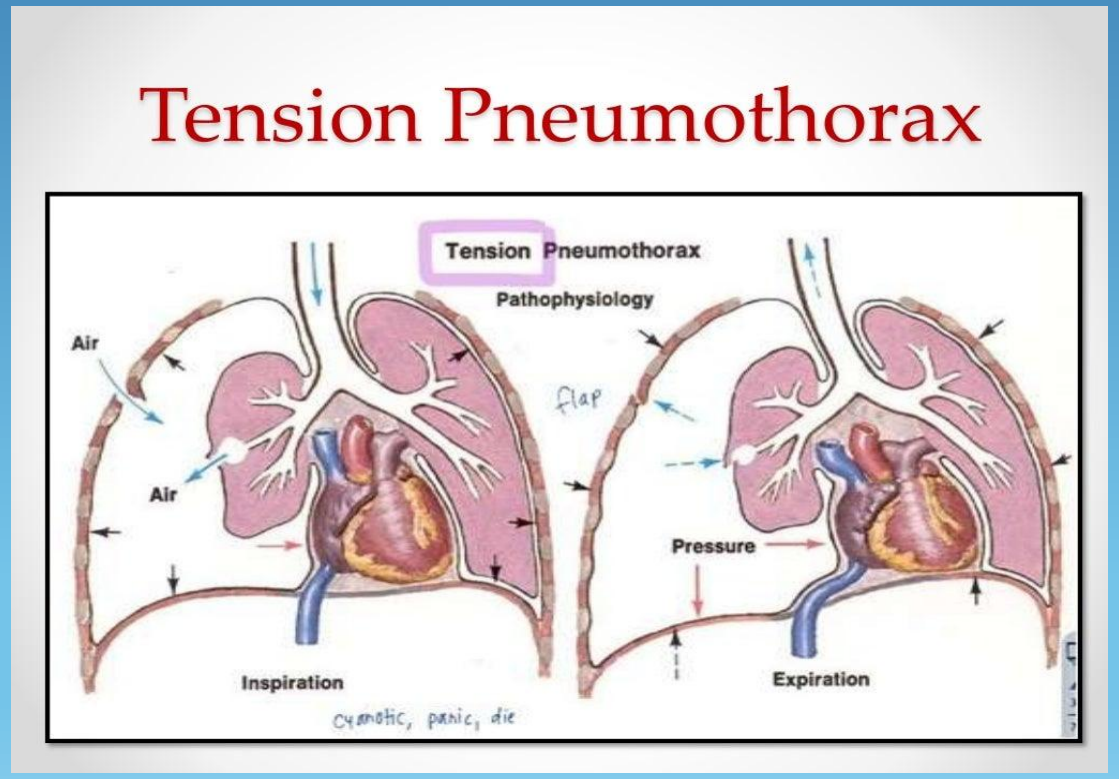
Obstructive Shock

- Failure of cardiac Filling. No Pre-load
- Tension PTX, Cardiac tamponade, Pulmonary embolism

Obstructive Shock







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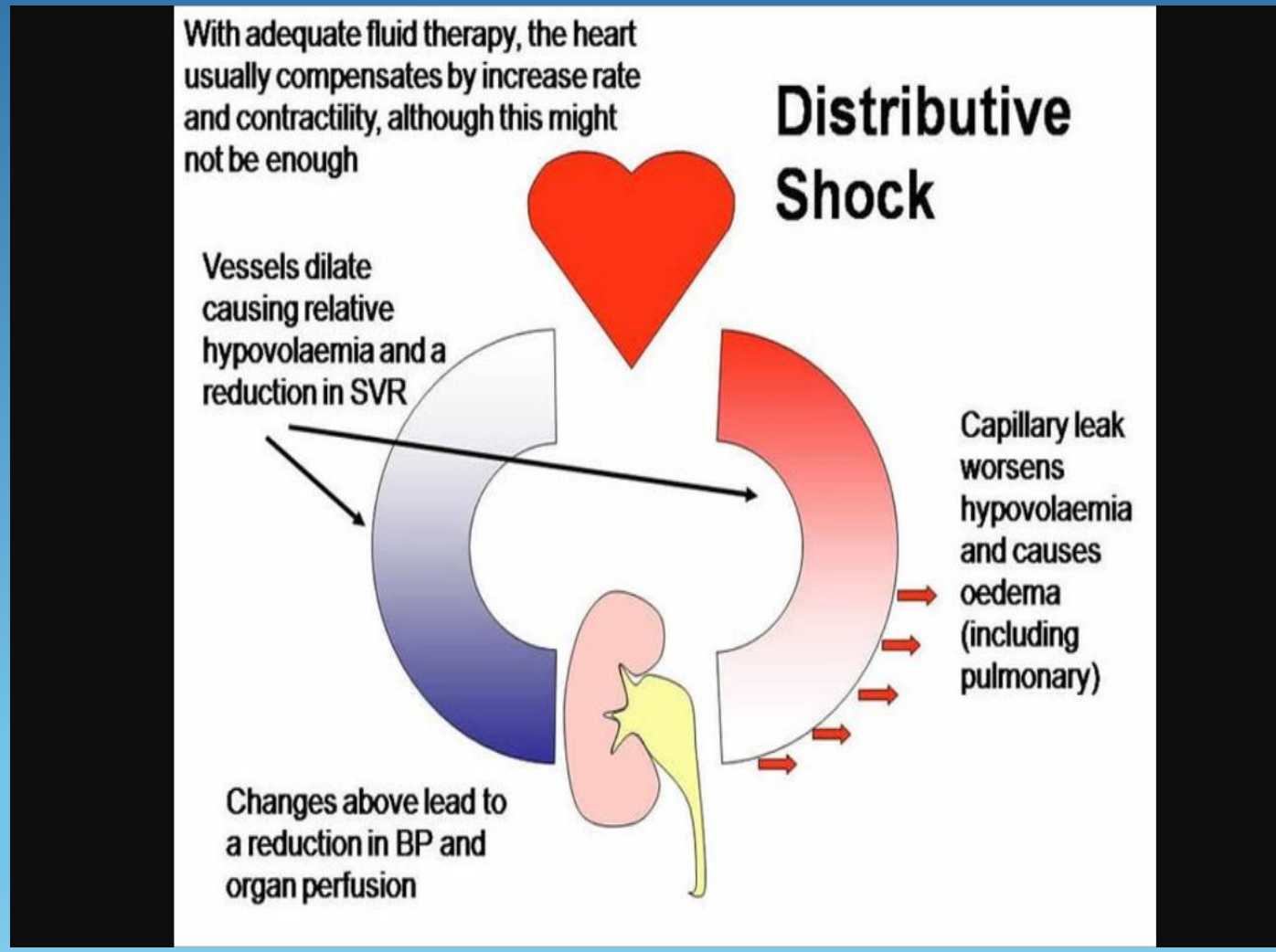
Distributive Shock

- Anaphylactic shock→ hemodynamic collapse.
  - Hypotension
  - Tachycardia
  - Hypoxia
  - From an offending agent

  Endocrine → adrenal insufficiency

  Distributive shock→ “Septic shock”
  From infection
  Hypotension and tachycardia
  Capillary Leak



Hypovolemic Shock

- Lack of volume
- Decreased cardiac filling
- Tachycardia
- Hypotension
- Subcategory
  - Hemorrhagic

Hypovolemic Shock

Classes of Hypovolemic Shock

	Class I	Class II	Class III	Class IV
Blood Loss	< 750	750-1500	1500-2000	> 2000
% Blood Vol.	< 15%	15 – 30%	30 – 40%	> 40%
Pulse	< 100	**> 100**	> 120	> 140
Blood Pressure	Normal	Normal	**Decreased**	**Decreased**
Pulse Pressure	Normal	**Decreased**	**Decreased**	**Decreased**
Resp. Rate	14 – 20	**20 – 30**	**30 – 40**	**> 40**
UOP	> 30	**20 – 30**	**5 – 15**	**negligible**
Mental Status	sl. Anxious	mildly anx	**confused**	**lethargic**
Fluid	crystalloid	crystalloid	**blood**	**blood**

Treatment of shock

Recognize what type of shock you are treating	Categorize it
Remember :	Patients may have more than one type of shock
Three steps to treating shock	Resuscitation Identify the cause Reverse the underlying physiology

Concludes Part I of shock

Part 2 will discuss treatment of the classes of shock

Part 3 will look at monitoring and advance ICU treatment for Shock

Work Cited

- glycolysis with inadequate oxygen delivery waste products - Search Images
- sympathetic chain ganglion - Search Images
- cardiogenic shock - Search Images
- tension pneumothorax - Search Images
- cardiac tamponade - Search Images
- pulmonary embolism - Search Images
- distributive shock - Search Images
- hypovolemic shock - Search Images

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