**Pathophysiology of Shock**

**Definition:** Severe ↓ of blood flow to body tissue. A hypotension state that results in tissue hypoxia.

### Types of Shock
- **Hypovolemic:** Loss of blood, plasma or extracellular fluid.
- **Cardiogenic:** Myocardial damage, Arrhythmias, Valve issues.
- **Obstructive:** Obstruction to inflow or outflow.
- **Distributive**
  - **Neurogenic:** Loss of SNS tone.
  - **Anaphylactic:** Immunologic onset of vasodilation (histamine).
  - **Septic Shock:** Immunologic onset, Inflammatory substances.

### Stages of Shock
- **Compensatory:** Physiological mechanisms kick in to counter the hypotensive state.
- **Progressive (Decompensation):** Compensation is failing and the hypotensive state is worsening.
- **Refractory:** Organ failure and irreversible.

**Cardiogenic or Obstructive Shock**

- **Myocardial Failure**
- **Fluid Loss**
- **Vasodilation**
- **↓ SNS**

- **↓ EDV**
- **↓ Periph Resist**

- **↓ CO**

- **↓ MAP**

- **↓ Stim Baro Receptors**

- **CNS Ischemic Response**

- **Medullary Vasomotor Centers**

- **↓ PNS**

- **↑ SNS**

- **↑ HR and Contractility**

- **↑ Venous and Arterial Tone**

- **↑ Fluid Absorption**

- **↑ Cardiac Output**

- **↑ Mean Arterial Pressure**

- **↓ Organ Blood Perfusion**

**Additional Compensatory Mechanisms**

- **Breathing Rapid**
  - ↑ Venous return.

- **Renin Release**
  - SNS on beta receptors.
  - Because of low BP in Kidney.
  - Causes Ang II (Vasoconstriction and Aldosterone).
  - Aldosterone causes Na+ retention... water follows.

- **Adrenaline Release**
  - Increased vasoconstriction.

- **Thirst Centers Activated**
  - Increase water intake.

- **ADH Release**
  - Because of low BP.
  - Causes water retention.

- **Liver Glycogenolysis**
  - Adrenaline will cause this.
  - Blood osmolality ↑.
  - Shifts fluid towards capillaries.

- **Spleen and liver contraction**
  - Adds some blood cells and blood volume to circulation.

**Shock Decompensation Mechanisms**

- **↓ MAP**

- **↑ SNS; vasoconstriction**

- **↓ Organ Blood Flow**

- **Heart**

- **GI**

- **Kidney**

- **Other Organs**

- **↑ Toxins**

- **Electrolyte Imbalance**

- **Acidosis**

- **Vasodilators**

- **Myocardial Failure**

- **Venous Tone**

- **Arteriole Tone**

- **↑ Capillary Pressure**

- **↓ PR**