

An Approach to Shock

What is shock?

A pathophysiologic state characterized by a **systemic impairment in oxygen delivery** as a result of reduced tissue perfusion, almost universally mediated by **low blood pressure**.

Signs of shock:

- **Low blood pressure**
- **Tachycardia**
- **Tachypnea**
- **Hypoxemia**
- **Weak peripheral pulses**
- **Altered mental status**
- **Cool extremities**
- **Peripheral cyanosis**
- **Low urine output**
- **Elevated creatinine**
- **Elevated lactate**
- **Acidemia**

Diagnostic Framework

Hypovolemic (Intravascular volume depletion)	Distributive (Vasodilation)	Cardiogenic (Decreased contractility)	Obstructive (Mechanical obstruction to blood flow)
Hemorrhagic <ul style="list-style-type: none">• Trauma• GI hemorrhage• Ruptured aortic aneurysm• Retroperitoneal bleed Non-hemorrhagic <ul style="list-style-type: none">• Severe diarrhea• Intractable vomiting	Sepsis Anaphylaxis Spinal cord trauma (a.k.a. neurogenic shock)	Acute MI Severe heart failure exacerbation (any cause) Myocarditis	Massive pulmonary embolism Pericardial tamponade Tension pneumothorax

	Hypovolemic	Distributive	Cardiogenic	Obstructive
JVP	Low	Low	High	High
Temperature of extremities	Cold	Usually warm	Cold	Cold
Effect of passive leg raise on pulse pressure	Increased	Increased	No effect	No effect
IVC on ultrasound	Non-dilated Collapsing with respiration	Non-dilated Collapsing with respiration	Dilated Non-collapsing with respiration	Dilated Non-collapsing with respiration
LV function on ultrasound	Hyperdynamic	Usually hyperdynamic	Decreased	Usually normal
Other findings	<p>History of bleeding or dehydration</p> <p>Low Hemoglobin → Hemorrhagic (can be misleadingly normal early)</p> <p>High hemoglobin → Non-hemorrhagic (hemoconcentration)</p>	<p>Infectious symptoms → Sepsis</p> <p>Fever, high or low WBC, new focal opacities on CXR → Sepsis</p> <p>New medication or food → Anaphylaxis</p>	<p>History of cardiac disease and/or CV risk factors</p> <p>S3 on exam</p> <p>Elevated BNP, troponin</p> <p>Signs of ischemia on ECG</p> <p>(Blood pressure is occasionally normal In cardiogenic shock)</p>	<p>History of malignancy or DVT risk factors</p> <p>DVT on exam → Massive PE</p> <p>Soft heart sounds, pulsus paradoxus, pericardial effusion on ultrasound or CXR → Tamponade</p> <p>Unilateral absence of breath sounds, pneumothorax on CXR → Tension pneumothorax</p>



Diagnostic next steps:

General mechanism usually obvious

GI bleed → EGD and/or colonoscopy

If hemorrhagic, but not GI/trauma → Consider CT abdomen

If septic shock suspected → Blood, urine, +/- sputum cultures

Consider Abdominal CT

Formal echocardiogram

Serial troponins and ECGs

If acute MI likely → Cardiac cath

If PE suspected → CTA thorax

If tamponade suspected → Echo