

Undifferentiated Shock



1. Is this person in SHOCK?

SHOCK has many manifestations; the diagnosis is a clinical gestalt:

- **HYPOTENSION** is one of many indicators of shock, however not everyone with a low BP is in shock & shock is possible with a normal BP (e.g. **CRYPTIC SHOCK**)
- **ALTERED MENTATION**
- **CARDIAC ISCHEMIA** (elevated troponin, EKG changes)
- **ACUTE KIDNEY INJURY** (low UOP, rising creatinine)
- **SHOCK LIVER** (elevated transaminases, coagulopathy)
- **POOR SKIN PERFUSION** (prolonged capillary refill)
- **LACTATE PRODUCTION** (lactic acidosis)

SHOCK is a state of inadequate oxygen delivery to meet the persons metabolic demands. Shock, if untreated, will rapidly lead to organ failure and death.

CRYPTIC SHOCK is when someone is in a shocked state but with a "normal" blood pressure. Also called compensated shock, this is often an early manifestation.

UNDIFFERENTIATED SHOCK is when the etiology of shock is unknown.

2. What category of SHOCK?

Using history, physical exam, & POCUS you can (often) determine what category of shock is present. This allows simultaneous diagnosis and initiation of specific therapy.

MIXED SHOCK states are when features of multiple types of shock are present. For example: severe metabolic derangements (hypothermia, severe acidosis), endocrinopathies, or overlapping problems (GI bleed in someone with heart failure)

See ICU OnePager for a more detailed discussion



PUMP

PIPES

TANK

Low CO from an *intrinsic* cardiac problem

Low CO from an *extrinsic* cardiac problem

Low SVR

Low preload

CARDIOGENIC

- **RATE/RHYTHM** (brady, VT, etc)
- **RV FAILURE** (MI, PHTN)
- **LV FAILURE** (MI, myocarditis, etc)
- **VALVULOPATHY** (wide open MR, cordae rupture, etc)
- **TOXINS** (CCB or BB overdose, BRASH syndrome, etc)
- **TRAUMA** (myocardial contusion)

OBSTRUCTIVE

- **TENSION PNEUMOTHORAX**
- **PERICARDIAL TAMPONADE**
- **PULMONARY EMBOLISM**
- **OUTFLOW OBSTRUCTION** (critical AS, dynamic LVOT obstruction)
- **DYNAMIC HYPERINFLATION** (high auto-PEEP)

DISTRIBUTIVE

- **SEPTIC SHOCK**
- **ANAPHYLAXIS**
- **INFLAMMATORY** (pancreatitis, post cardiac arrest, cytokine release syndrome, amniotic/fat embolism)
- **NEUROGENIC** (spinal cord injury, severe TBI, high neuraxial anesthesia)
- **LIVER FAILURE**
- **ENDOCRINOPATHY** (hypothyroid, adrenal insufficiency)
- **MEDICATIONS** (anesthesia, sedation)

HYPOVOLEMIC

- **HEMORRHAGE** (traumatic, post-surgical, GI bleed, etc)
- **SKIN LOSSES** (burns, heat stroke, etc)
- **GI LOSSES** (diarrhea, vomiting, etc)
- **3rd SPACE LOSSES** (pancreatitis, low albumin states, trauma, etc)
- **RENAL LOSSES** (diuretics, osmotic diuresis [DKA], hypoaldo, salt wasting)
- **LOW PO INTAKE**

Specific etiologies

Physical Exam

POCUS

Skin: **COOL, DELAYED CAP REFILL**
 Neck veins: **DISTENDED**
 Pulses: **WEAK PULSES w/ NARROW PULSE PRESSURE**
 Other: CANNON A WAVES (AV dissociation), NEW LOUD HEART MURMUR (valvulopathy)

Skin: **COOL, DELAYED CAP REFILL**
 Neck veins: **DISTENDED**
 Pulses: **WEAK PULSES w/ NARROW PULSE PRESSURE**
 Other: HEART & LUNG SOUNDS are poor indicators of PTX or tamponade. UNILATERAL EDEMA may suggest PE.

Skin: **WARM, FLUSHED, BRISK CAP REFILL** (initially)
 Neck veins: **VARIABLE**
 Pulses: **"BOUNDED" w/ WIDE PULSE PRESSURE & LOW DBP**
 Other: SIGNS of LIVER DISEASE (palmar erythema, spider angioma) or signs of fat emboli (petechiae)

Skin: **COOL, DELAYED CAP REFILL**
 Neck veins: **FLAT**
 Pulses: **WEAK "THREADY" PULSES w/ HIGH DIASTOLIC BLOOD PRESSURE**
 Other: **CONJUNCTIVAL PALLOR** (hemorrhage), **AXILLARY DRYNESS**

Heart: **DECREASED SYSTOLIC FXN**, may have specific **REGIONAL WALL MOTION ABNORMALITIES** or **VALVULOPATHIES**
 Lungs: **B-LINE PATTERN, ± PLEURAL EFFUSIONS** (LV failure)
 IVC: **DILATED IVC** (usually) ± **REVERSAL OF FLOW** in HEPATIC VEIN
 Other:

Heart: **DECREASED SYSTOLIC FXN, DILATED RV** (PE), **SEPTAL D SIGN** (p/v overload), **PERICARDIAL EFFUSION w/ RA/RV COLLAPSE** (tamponade)
 Lungs: **ABSENT LUNG SLIDING ± LUNG POINT** (PTX)
 IVC: **DILATED IVC ± REVERSAL OF FLOW** in HEPATIC VEIN
 Other: **McCONNEL'S SIGN** (PE), **DVT** (PE), **INCREASED LVOT GRADIENT w/ DAGGER SHAPE** (LVOT)

Heart: **HYPERDYNAMIC LV** (usually, may develop CV dysfunction in late sepsis)
 Lungs: **A-LINE PATTERN** (usually) ± **SIGNS OF PNEUMONIA** (sepsis)
 IVC: **VARIABLE IVC**
 Other: **SIGNS OF INFECTION** (lung, endocarditis, gallbladder, etc), **CIRRHOISIS ± ASCITES**

Heart: **HYPERDYNAMIC LV ± SIGNS of UNDERFILLED LV**
 Lungs: **A-LINE PATTERN**
 IVC: **SMALL, COLLAPSING IVC ± PHASIC RESPIRATORY VARIATION**
 Other: **POSITIVE FAST EXAM** (blood in chest, abdomen), **AORTIC DISEASE, ECTOPIC PREGNANCY**, etc

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 Infographic by Nick Mark, MD

