مؤسسة مستشفى سرطان الأطفال-مصر
Children's Cancer Hospital Foundation - Egypt
57357


# Mohammad Yahia Zahw

جمعية أصدقاء المبادرة القومية ضد السرطان
Association of Friends of the National Cancer-free Initiative
AFNCI

Egypt Cancer Network USA
57357

Egypt Cancer Network Canada
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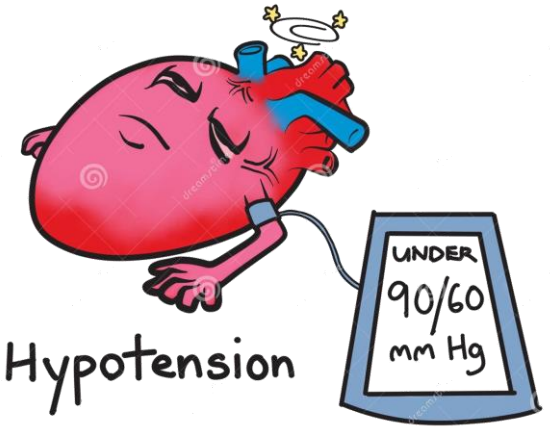
# This Lecture

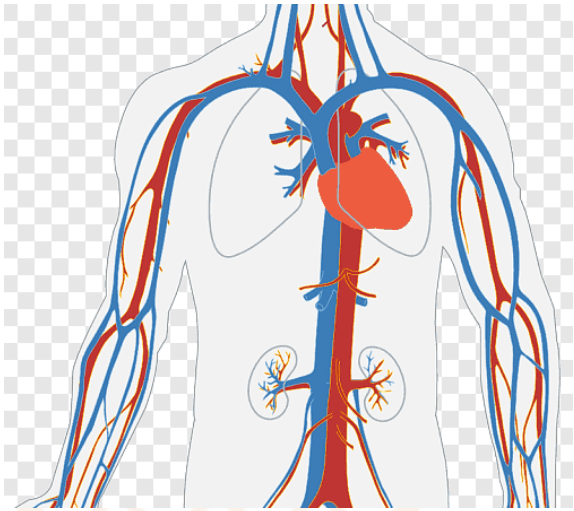
- Definition
- Complications
- Phases
- Organs Response
- Types of Shock

# Definition




- Shock is a state of Systemic Hypotension (↓BP)
- ↓BP happens either due to ↓CO or ↓Blood Volume

- Shock is a state of circulatory dysfunction that results in insufficient O2 delivery & other substrate to meet tissue metabolic demands.



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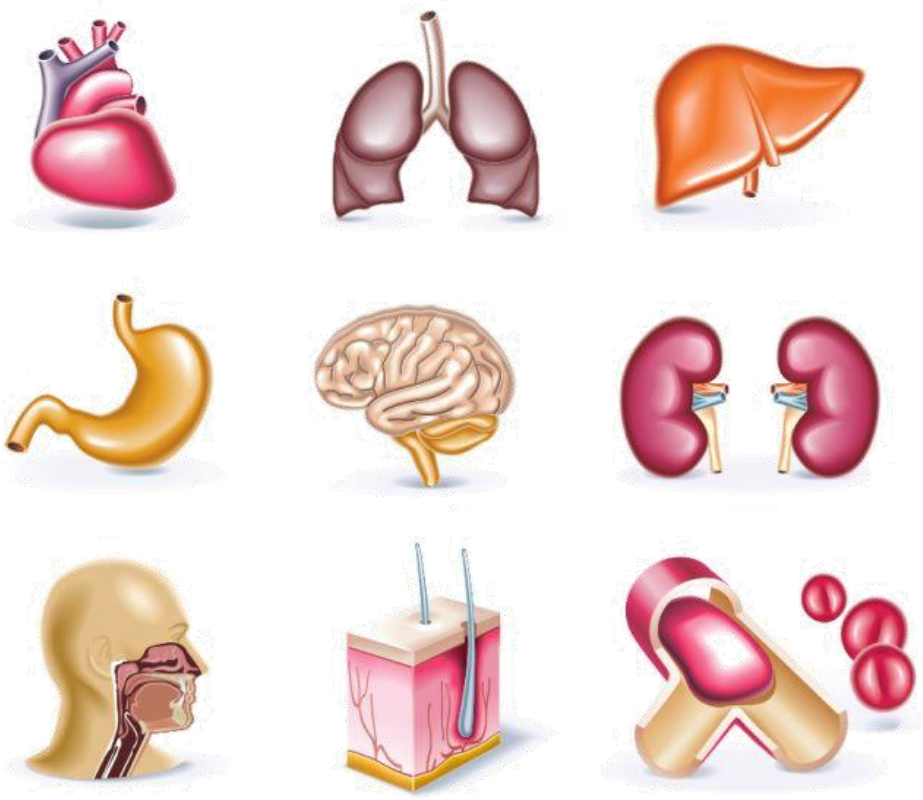
# Definition



- Shock leads to Anaerobic Metabolism resulting in Lactate production and metabolic acidosis.

- If this state persists, it can lead to multiple organ dysfunction and DEATH.

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# Phases of Shock

## Compensated

Homeostasis is maintained by body's compensatory mechanisms:

- ❑ ↑ SVR & ↑ CO
- ❑ ↑ HR (tachycardia)
- ❑ ↓ O2 delivery to GIT
- ❑ ↑ O2 consumption at Heart, Brain and Kidneys
- ❑ ↑ O2 consumption → ↑ CO2 production (therefore ↑ RR)

## Uncompensated

- ❑ Imbalance between O2 delivery and O2 consumption
- ❑ Deterioration in cellular metabolism and organs functions
- ❑ ↑ Lactate production → Acidosis
- ❑ Hypotension

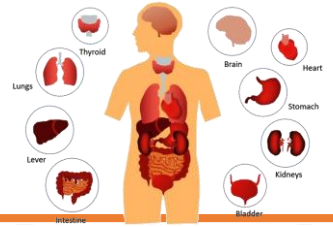
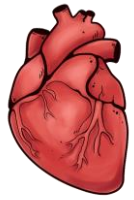
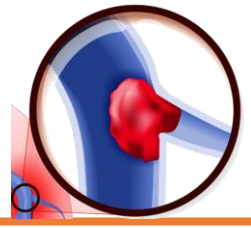
## Irreversible

- ❑ Also called: Terminal
- ❑ Damage to key organs
- ❑ Death is common

# Organs Response in Shock

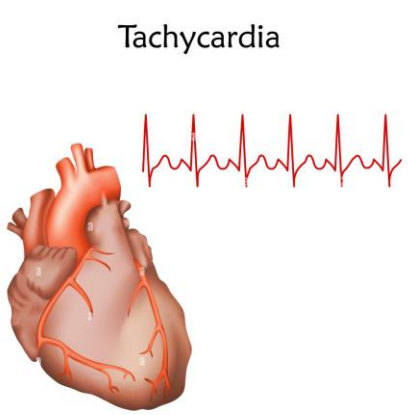
| System | Compensated Shock | Uncompensated Shock |
|---|---|---|
| CNS | Restless, Lethargy, Anxiety | Agitated, Confused, Coma |
| Respiratory | ↑ Ventilation | ↑↑↑ Ventilation |
| CVS | Tachycardia<br>Normotension or mild HTN<br>Delayed or Bounding pulses | Tachycardia or Bradycardia<br>Diminished to absent peripheral pulses |
| Metabolism | Compensated metabolic Acidemia | Uncompensated metabolic acidemia |
| GIT | Impaired motility | Ileus |
| Kidneys | Oliguria | Oliguria / Anuria |
| Skin | Cool extremities, delayed capillary refill | Cyanosis |

# Types of Shock

| Type of Shock | Primary derangement | Common Causes | |
|---|---|---|---|
| Hypovolemic  | Decreased circulating blood volume due to internal or external losses | • Hemorrhage<br>• Fluid losses: GI, renal capillary leak<br>• Burn | |
| Distributive   | VD, venous pooling | • Anaphylaxis<br>• Neurogenic<br>• Drug toxicity | • Sepsis |
| Cardiogenic  | Decreased myocardial contractility and cardiac pump failure | CHD, Ischemia, Trauma, CHF, Cardiomyopathies (Infections), Drug toxicity | |
| Obstructive  | Mechanical Obstruction of ventricular outflow | Massive pulmonary embolus, Tension pneumothorax | |
| Dissociative  | O2 not released from Hg | Carbon monoxide poisoning | |

# Presentation of a shocked patient

Pale & Sweating

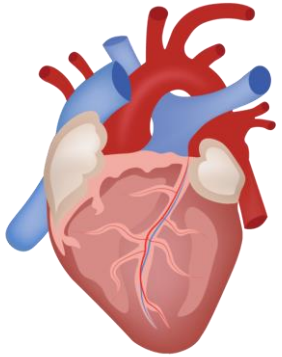



Tachycardia and Tachypnea


Hypotension

Altered Mental Status

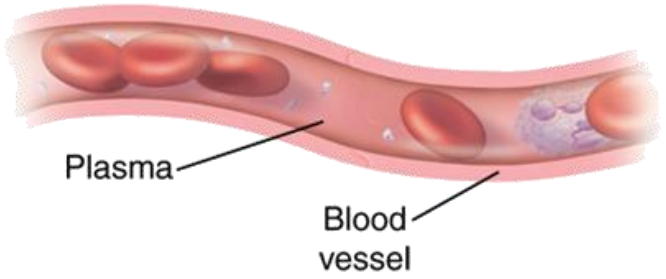
# How to manage?



## Cardiogenic

↓

Inotropes




## Hypovolemic

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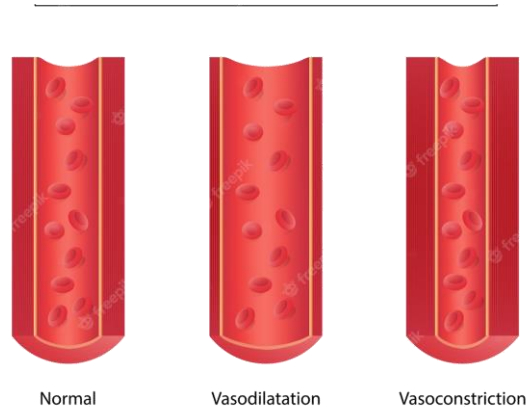
Fluid Replacement




## Septic

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- Antibiotics
- Anti-inflammatory

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# How to manage?

## Fluid Replacement

➢ **Shock Therapy:**

- NS or Ringer
- Bolus
- 20 ml/kg
- x3 times

**Blood Pressure ??**

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# How to manage?

## Antibiotics


- Collect blood culture
- Start empirical antibiotics:
  - Meropenem: 20 mg/kg Q8
  - Amikacin 7.5 mg/kg Q12
  - Vancomycin 15 mg/kg Q6 hrs


- Dose Modification
- Drug Interactions
- TDM

- History of Blood Cultures ?

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THANK YOU
PHARMACIST