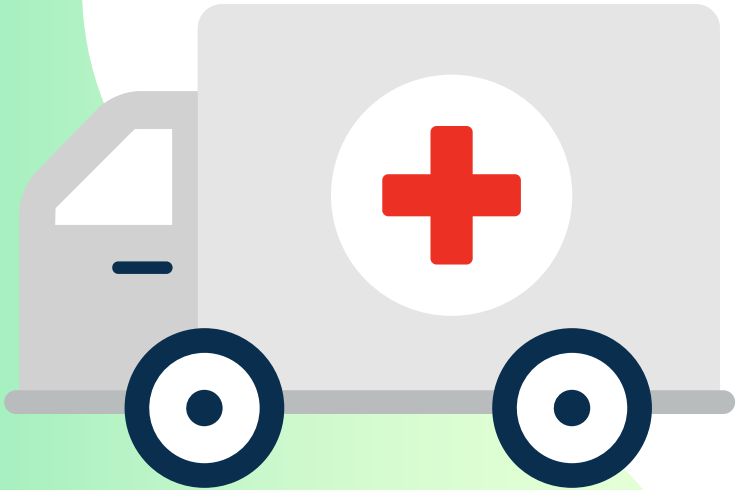
Major Consequences of Hypothermia in Trauma Patients

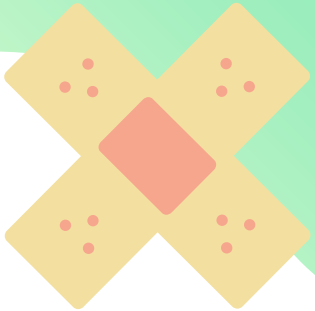
Reminder!!

It does not need to be cold to create a hypothermic environment.

- **Causations**
  - fluid resuscitation- irregular amounts of cool isotonic solutions (NS)
  - Exposure to cooler ambient temperatures
  - Large burns- weepy fluids
  - Medications (), alcohol
  - Shock- hypoperfusion causes temperature regulation to fail
  - Temp < 35.5

Caution





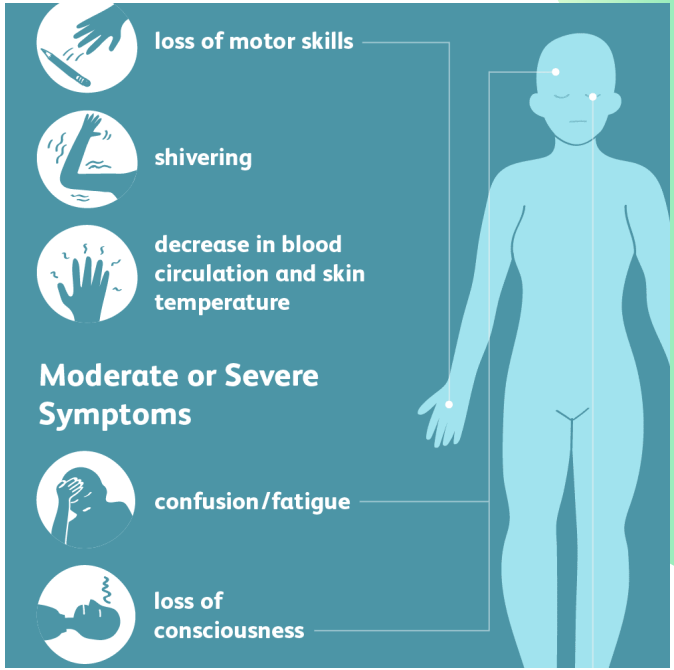
**Attempting to rewarm a hypothermic trauma patient may cause serious problems as the blood pooled in the periphery of the body returns to its central core – brings along high amounts of waste and acidosis.

Signs and Symptoms

Nonpalpable pulses due to vasoconstriction

Tachypnea initially, leading to apnea

Shivering: signals beginning of hypothermia. Increases O2 consumption by muscle cells as much as 400%



Consequences of hypothermia- overview

01
Cardiovascular complications

02
Bleeding

03
Infection

04
Acid-Base Imbalances

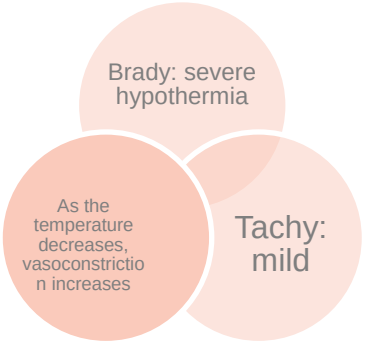
05
Renal complications

Cardio Complications

⇩ Cardiac output

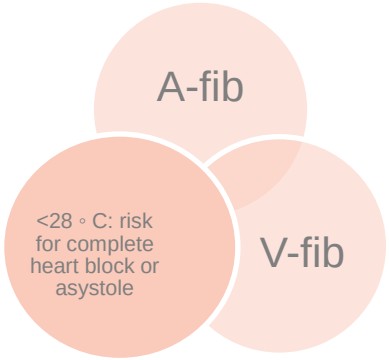
Leads to myocardial ischemia

Bradycardia or tachycardia



Impaired tissue O2 delivery

Arrythmias

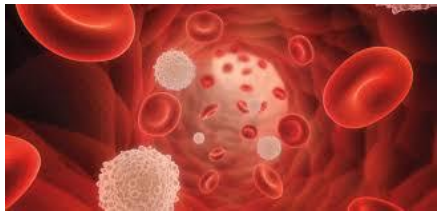


⇩ Response to catecholamines

Epinephrine

Bleeding

Thrombocytopenia



Due to sequestration of platelets → Complicated by abnormal platelet function → Cannot form clot to stop hemorrhage → Prolonged bleeding times

PT > 14.7

APTT > 45 secs

Infection

↓ amount and function of WBCs

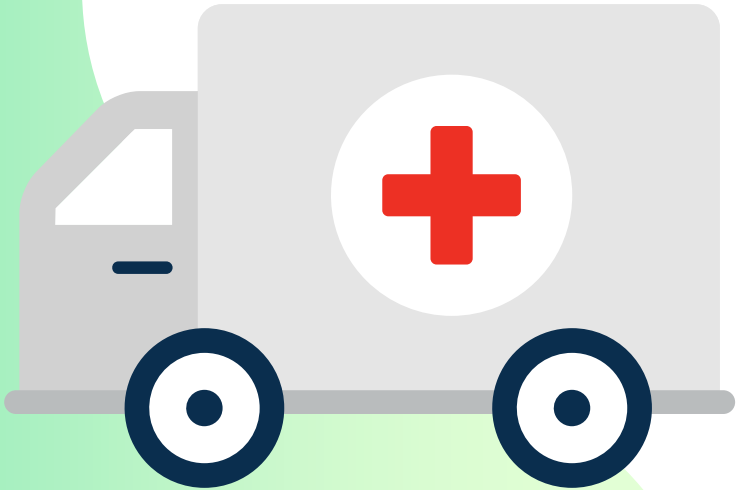
↑ Risk of wound infection, pneumonia, and sepsis

Acidosis

- Circulatory insufficiency
- Tissue anoxia
- Aneorobic metabolism – excessive lactic acid production
- Liver cannot metabolize = metabolic acidosis PH <7.25
- Decreased metabolism and ventilation = accumulation of CO2 = respiratory acidosis

Rosenfeld, J. B. (1963). Acid-base and electrolyte disturbances in hypothermia. *The American Journal of Cardiology*, *12*(5), 678–682. https://doi.org/10.1016/0002-9149(63)90259-5

Renal Complications



Hypothermia ↓ ability of kidney to reabsorb fluids and electrolytes

Causes initial inappropriate cold diuresis

Temp continues to ↓ = urine output ↓

Increases risk for hypotension