Shock

**Definition** - widespread inadequate tissue perfusion

Caused by state of collapse and failure of the cardiovascular system
Compensatory Mechanisms

- tachycardia
- vasoconstriction
- increased respiratory rate & depth
- decreased urine production
Shock

4 major categories of shock

- hypovolemic
- cardiogenic
- obstructive
- distributive
hypovolemic shock

inadequate blood / fluid volume

- trauma
- hemorrhage
- burns
- dehydration
Cardiogenic shock

- Pump failure - Heart lacks power to force blood through the circulatory system
  - Basically, CHF that is out of control

- Onset may be immediate or not apparent for 24 hours after AMI

- Can also be caused by Dysrhythmias
Obstructive shock

Physical obstruction of blood flow

- tension pneumothorax
- cardiac tamponade
- pulmonary embolus
- dissecting aortic aneurysm
Distributive shock

widespread reduction of blood vessel tone (vasodilation)

- neurogenic (spinal cord trauma)
- Sepsis – see dehydration
- anaphylaxis
- drugs/ overdose
- psychogenic
Shock

Early Signs (compensated)

- Pale, cool, moist skin**
- Tachycardia
- Delayed capillary refill
- Tachypnea
- Agitation/anxiety/restlessness
- ALOC**
- Nausea/Vomiting
- Marked thirst
Shock
Late signs (decompensated)

- Early signs PLUS
- Hypotension
- Labored irregular breathing
- Ashen, mottled, cyanotic skin
- Thready or absent peripheral pulses
- Dilated pupils
- Poor urinary output
When to Expect Shock

- Multiple severe fractures
- Abdominal or chest injuries
- Spinal injuries
- Severe infection
- Major heart attack
- Anaphylaxis
treatment for shock

Treatment does not vary with type of shock
TX for shock

- Maintain airway
- Control external bleeding
- Shock position
- High flow oxygen
- Rapid transport
- Keep warm
- Do not give the patient anything by mouth
ALS Considerations

- IV Fluid “challenges” (hypovolemic)
- Medications (cardiogenic / distributive)
- MAST- Medical Anti Shock Trousers (not used in California)
Dehydration

History of:
- nausea
- vomiting
- exertion
- diarrhea
Dehydration

Signs

dry mucus membranes
sunken eyes
decreased urination
poor skin turgor

note: fontenelles for pediatrics
what is Blood pressure?

\[ BP = CO \times PVR \]
Cardiac Output (CO)

- the amount of blood pumped by the left ventricle over 1 minute

- $CO = \text{Stroke volume} \times \text{BPM (beats per minute)}$
Stroke Volume

the amount of blood pumped by the left ventricle in one contraction
Peripheral Vascular Resistance

- the force against which the heart has to beat.
- partially determined by the size of the blood vessels
- AKA PVR