Effective Arterial Blood Volume (EABV)

- The part of the intravascular volume (IV) that is in the arterial system and effectively perfusing tissues (Usually 700ml/70kg in men)
- A indirect reflection of the pressure perfusing the kidneys
- Stretch -sensitive baroreceptors on the carotid sinuses and glomerular afferent arterioles sense this arterial pressure

Factors affecting EABV

Normal State

- Change in posture
  - i.e. standing up
  - Gravity pulls blood to feet/legs
  - Legs hyper-perfused, brain under-perfused (low EABV)
  - Carotid sinus baroreceptor activation ↑ sympathetic tone
  - Vasoconstriction of vessels in feet restores cerebral perfusion

- Change in diet (ingested Na+)
  - Na+ gain: ↑ EABV, Urine Na+ > 40
  - Na+ loss: ↓ EABV, urine Na+ <20

Diseased state

- Hypotension (Shock)
  - ↑ salt+water in blood, ↑ salt+water leaking into ISF
  - High EABV (Hypertension, edema, high urine Na+: >40)
  - Compensation: ↓ RAAS, ↑ tubular Na+ reabsorption

- Conditions causing pitting edema
  - Overfill (pathologic kidney retention of Na+/water)
  - Underfill (pathologically low EABV for other reasons)

EABV can be predicted by Urine [Na+]

- High EABV
  - ↑ filtration of NaCl + water by kidneys
  - ↑ urine Na+ (>40)

- Low EABV
  - ↓ filtration of NaCl + water by kidneys
  - ↓ urine Na+ (< 20)

2 exceptions: urine Na+ can be high with low EABV when:
1. Pt is on lasix: prevents Na+ reabsorption in loop of Henle.
2. Pt has diseased tubule cells (preventing Na+ reabsorption)

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