Objectives

To present the homeostasis mechanism of water balance and water replacement.

To explore the regulatory mechanisms that govern water balance.

Water Balance

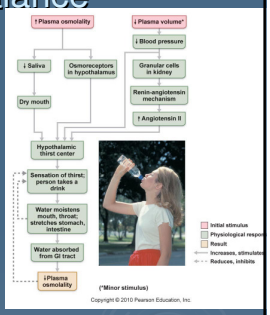
Intake must equal loss

Intake

> Mouth (food and water)

> Cellular metabolism

→ 2500 ml/day



Loss

→ 2500 ml/day (majority lost via urine)

Thirst Mechanism

Registered in the ***hypothalamus***

- A region called the thirst center responds when plasma osmolality increases only 2-3%. **Main stimulus** for thirst.
- When Blood Volume decreases (10-15% required change) this stimulates the same response perception i.e. the need to ingest water.

Regulation of Water Intake

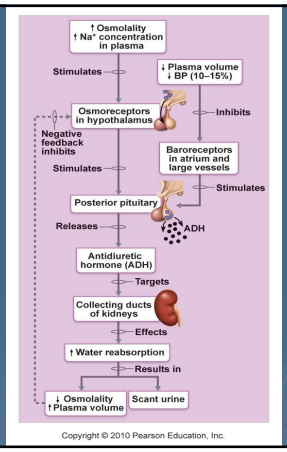
Importance of regulation:

- to maintain Blood Pressure
- to maintain intracellular solute conc.

Endocrine regulation:

ADH – Retaining water for ^ BP

Aldosterone - ^ BV



Factors triggering ADH release

- Reduced blood volume
- Prolonged fever
- Excessive sweating
- Vomiting
- Diarrhea
- Severe blood loss
- Traumatic burns

Disorders of Water Balance

I. Dehydration Pg 8
   - Water output exceeds intake.
   - Negative fluid balance.

II. Hypotonic Hydration/Over-hydration
   - Excessive electrolyte dilution
   - Leads to severe metabolic disturbances

III. Edema

Edema
Revisited

Atypical accumulation of fluid in the (IF)

Factors:
- Increased BP
- Inflammatory response
- Hypoproteinemia
- Increased capillary permeability
- Increased hydrostatic pressure in the capillaries:
  - Incompetent venous valves
  - Localized blood vessel blockage
  - Congestive heart failure
  - High blood volume

Electrolytes

Electrolyte balance specifically refers to the balance of salts in the body.

> Intake – food and drink
> Outflow – Perspiration, feces and urine

Kidneys play a key role in controlling excretion of electrolytes
i.e Reabsorption & Secretion

Assignment

Matrix table for
- Electrolyte importance
- Characteristics
- Name of Disorders
  - Symptoms of Disorders

Find on Instructor Website – fill out as per assigned topic for Wed.