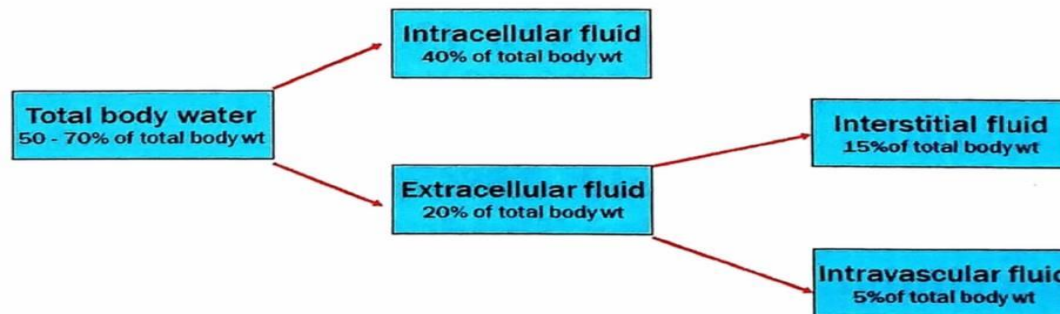
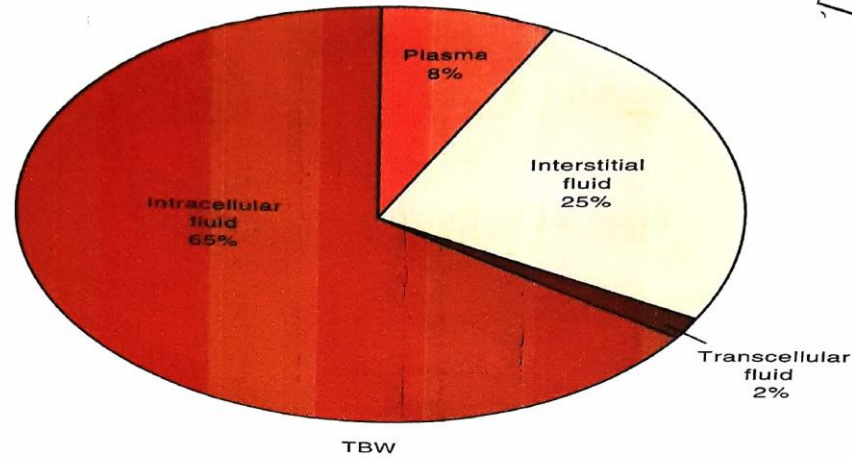


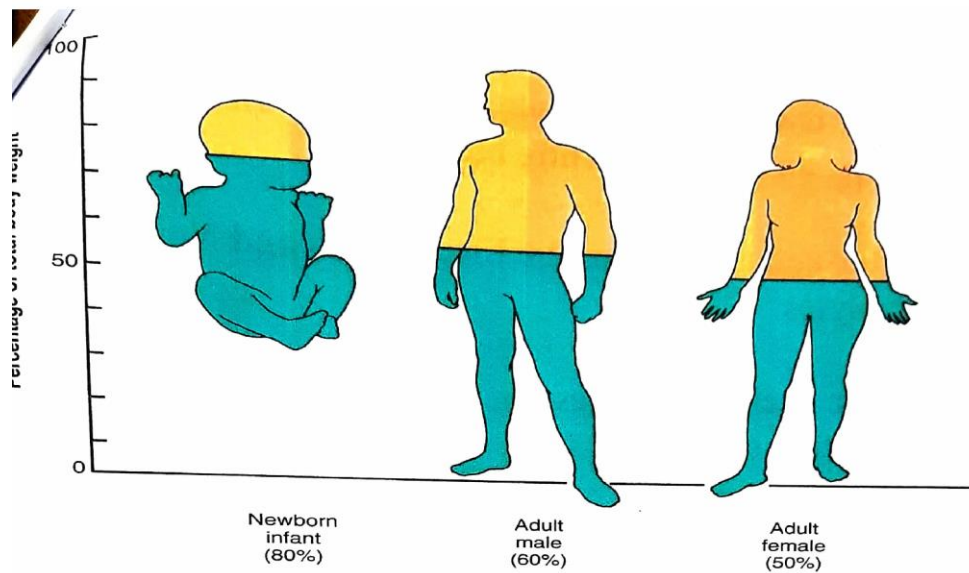
Fluid & Electrolytes Balance
General Chemistry
Lec 8





In an adult of 70 kg body

- **Total Body Water 60- 70% (36-49 L)**
- **Intracellular Fluid -65 % (35 L)**
- **Extracellular Fluid -35% (14 L)**
- **Interstitial Tissue Fluid -25% (11L)**
- **Plasma /Intra Vascular Fluid -8% (3L)**
- **Transcellular Fluid- 2%**



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Functions Of Body Water

- **1-Involved in Biochemical reactions:**
Water act as reactant in many hydration Hydrolytic reactions of metabolic pathways.
- **2-Transporting media of body:**
Transportation of nutrients and waste metabolites through aqueous media of blood and tissue floods.
- **3-Regulates body temperature**

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4-Water transports **Hormones, Enzymes, blood platelets**, and red and white blood cells

5-Water act as a solvent for **Electrolytes and Non electrolytes**

6-Water Facilitates **Digestion** and promoting **Elimination of ingested food**

7-Water serve as a tissue **Lubricant**

Body Water Input and Output

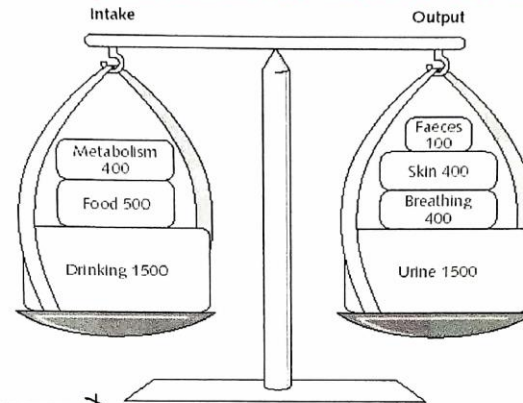
 **Body can gain water by:**

- 1-**Ingestion** of liquids and moist foods (2300mL/day)
- 2-**Metabolic** synthesis of water during cellular respiration (200mL/day)

 **Body losses water through:**

- 1-**Kidneys** (1500mL/day)
- 2-**Evaporation from Skin** (600mL/day)
- 3-**Exhalation from Lungs** (300mL/day)
- 4-**Feces** (100mL/day)

A healthy body tries to regulate the body water
Proportionately distribute the water in ICF and ECF



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Electrolytes

Substance when dissolved in solution dissociates into ions

These ions are able to carry an electrical current

Salts like **NaCl** and **KCl** in aqueous solutions gets dissociated to

Charged ions Na^+ and Cl^- called as Electrolytes.

The **concentration of these Electrolytes is expressed as mEq/L.**

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Types Of Electrolytes

- **CATION** - Positively charged Electrolyte
- **ANION** - Negatively charged Electrolyte

ELECTROLYTES IN BODY FLUID COMPARTMENTS

INTRACELLULAR Electrolytes	EXTRACELLULAR Electrolytes
POTASSIUM	SODIUM
MAGNESIUM	CHLORIDE
PHOSPHOROUS	BICARBONATE

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To Maintain Electrical Neutrality In Each Fluid Compartments

- **Number Cations = Number Anions**

ECF Cations	ECF Anions
Na ⁺ (140 mEq/L)	Cl ⁻ (103 mEq/L)
K ⁺	HCO ₃ ⁻
Ca ⁺	HPO ₄ ⁻
Mg ⁺	SO ₄ ⁻
Total Cations 155 mEq/L	Total Anions 155 mEq/L

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Functions Of Body Electrolytes

1-Electrolytes are well distributed in the body compartments.

2-Electrolytes in the medium/compartments **produce osmotic pressure.**

This osmotic pressure **helps in maintaining water balance.**

3-**Na⁺**: Most abundant electrolyte in the ECF.

4-**K⁺**: Essential for normal membrane excitability for nerve impulse

5-**Cl⁻**: Regulates osmotic pressure and assists in regulating acid-base balance

6-**Ca²⁺**: Promotes nerve impulse and muscle contraction/relaxation

7-**Mg²⁺**: Plays role in carbohydrate and protein metabolism, storage and use of intracellular energy and **neural transmission. Important in the functioning of the heart, nerves, and muscles**

- **Filtration**: transfer of water and solutes through a membrane (From a **region of high pressure to a region of low pressure**)
- **Diffusion**: the random movement of particles in all directions through a solution
- **Osmosis**: movement of water across a membrane from a less concentrated solution to a more concentrated solution
- **Osmolarity**: The number of moles **per liter of solution**
- **Active transport**: Movement of solutes across membranes; **Requires transporters and expenditure of energy**
Movement of particles **is up a concentration gradient**

THANK YOU!

!! ANY QUESTIONS
PLEASE ASK