



SNS COLLEGE OF NURSING
Saravanampatti (po), Coimbatore.

DEPARTMENT OF NURSING
COURSE NAME : BSC (NURSING) I YEAR
SUBJECT : NUTRITION
UNIT: IX: WATER METABOLISM AND ELECTROLYTE
TOPIC : WATER METABOLISM



INTRODUCTION



Body composed of 60 – 70% of body fluids.

Distribution of Water in different body water compartments depends on the solute content of each compartment





BODY WATER COMPARTMENTS



Total body water (42L) 60% of Body weight

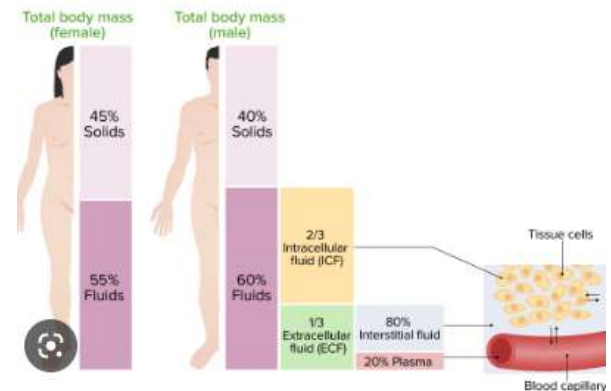
1) Intracellular (28L) – 40% of Body Weight

2) Extra cellular (14L) – 20% of Body Weight

- Intra vascular (2.8L) – 4% of Body Weight

- Extra Vascular (11.2L) – 16% of Body

Weight





WATER INTAKE



EXOGENOUS:

SOURCE: Ingested water, Beverages

WATER INTAKE RANGE: 1 – 5 L

Ingestion of water mainly controlled by a
THIRST CENTER located in **HYPOTHALAMUS**





WATER INTAKE



ENDOGENOUS:

SOURCE: Metabolic water produced within the body due to Oxidation of food stuffs

WATER FROM OXIDATION OF FOOD STUFFS:
300 ml – 350 ml/ day

intake of 1000 Kcal – 125ml water





IMPORTANCE OF WATER



- It provides a medium for Transporting nutrients to cells
- Water facilitates cellular metabolism and proper cellular chemical functioning
- Water acts as a solvent for electrolytes and nonelectrolytes.

IMPORTANCE OF WATER





IMPORTANCE OF WATER



- Helps to maintain normal body temperature
- Facilitates digestion and promotes elimination \
- Acts as a tissue lubricant
- Component in all body cavities

Why
water is
important
to life?



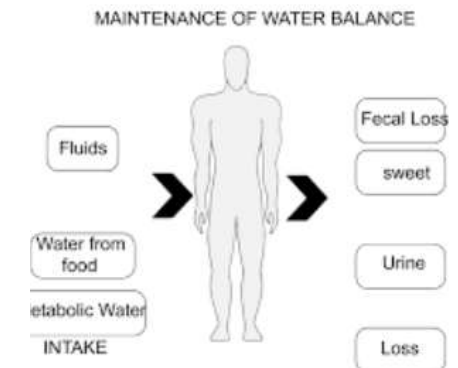


WATER OUTPUT



Four distinct routes for the elimination water from body

- 1) Urine- Water loss through kidneys, 1 - 2 L/day
- 2) Skin - water loss through body surface by Perspiration, 500mg/day
- 3) Lungs- Loss during Respiration, 700ml/ day
- 4) Feces – 50ml/day



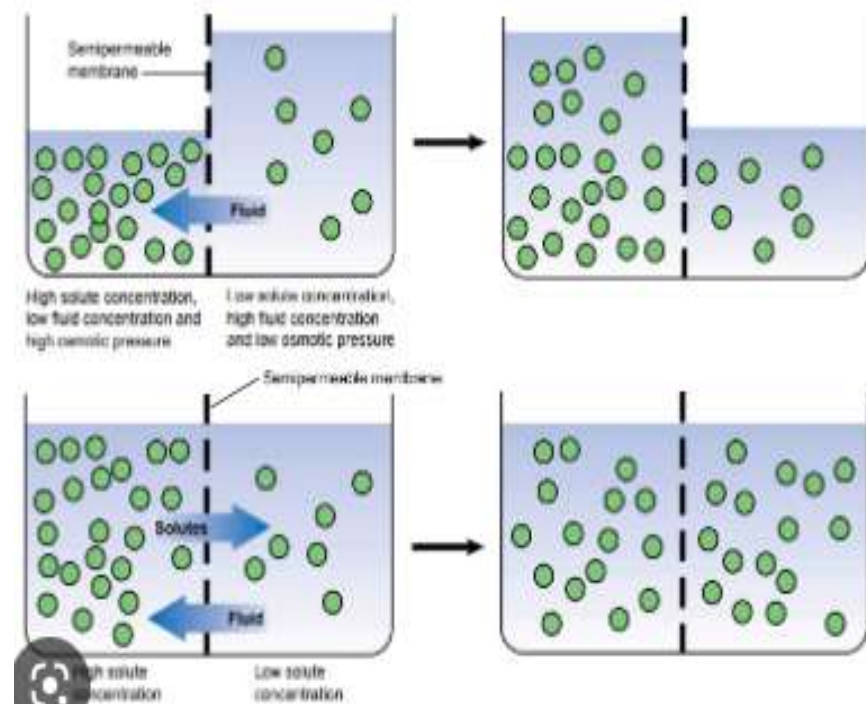


REGULATION OF BODY FLUID COMPARTMENTS



Body fluid compartments regulated by following mechanisms

- 1) Diffusion
- 2) Osmosis
- 3) Active transport
- 4) Filtration

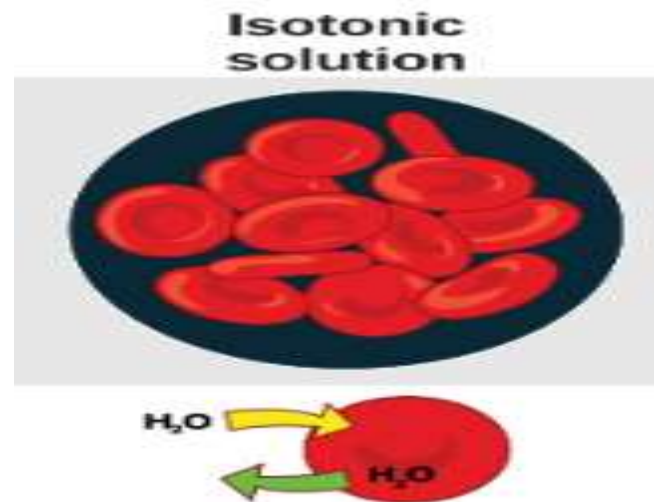




ISOTONIC



Solute concentration inside the cell is equal to the solution outside the cell.





HYPOTONIC



< Concentration of solutes as plasma,
causes H₂O to move into cells and Swells
(Hemolysis)

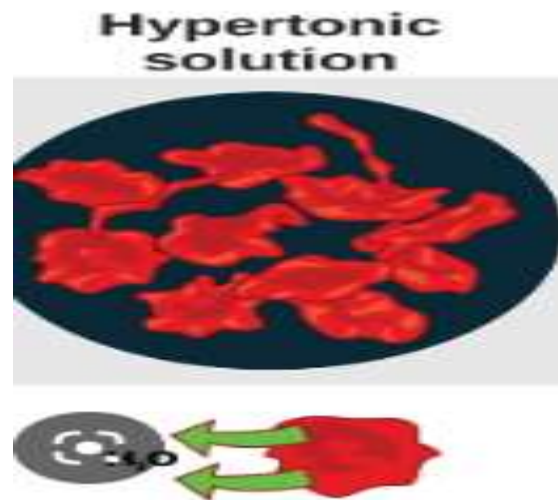




HYPERTONIC



> Concentration of solutes as plasma,
causes H₂O to draw out of cell (Shrink)





WATER REGULATION



An increase in osmolality of plasma



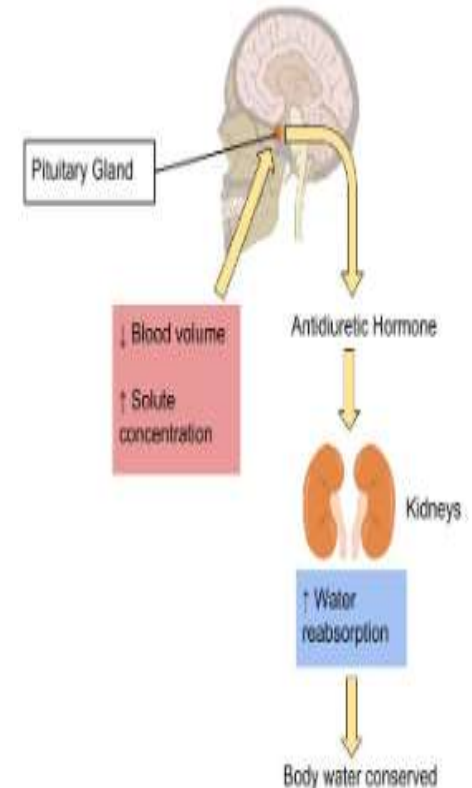
Produces ADH Secretion



Increased Water reabsorption from renal Tubules



Decreases urine output





WATER REGULATION



Decrease in Osmolality



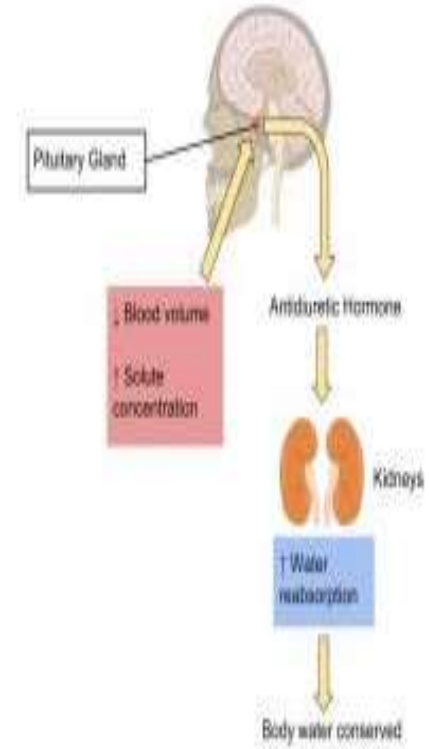
Produces decreased ADH Secretion



Decreased water reabsorption



Increases urine output





CONCLUSION



Distribution of body Water between intracellular and Interstitial compartment is determined by the osmotic pressure of interstitial fluid.





ASSESSMENT



- 1) Enlist importance of water.
- 2) Describe about regulation of water.
- 3) Define hypotonic and isotonic.





REFERENCE



- Darshan sohi, “ A comprehensive textbook of applied Nutrition and dietetics” , 3rd edition, published by Jaypee publication.
- Shella John, Jasmine devaselvam, “Essentials of Nutrition and dietetics for nursing”, 2nd edition, published by Wolters Kluwer.

