

FLUIDS, ELECTROLYTES & IV THERAPY

Composed of largely
fluid

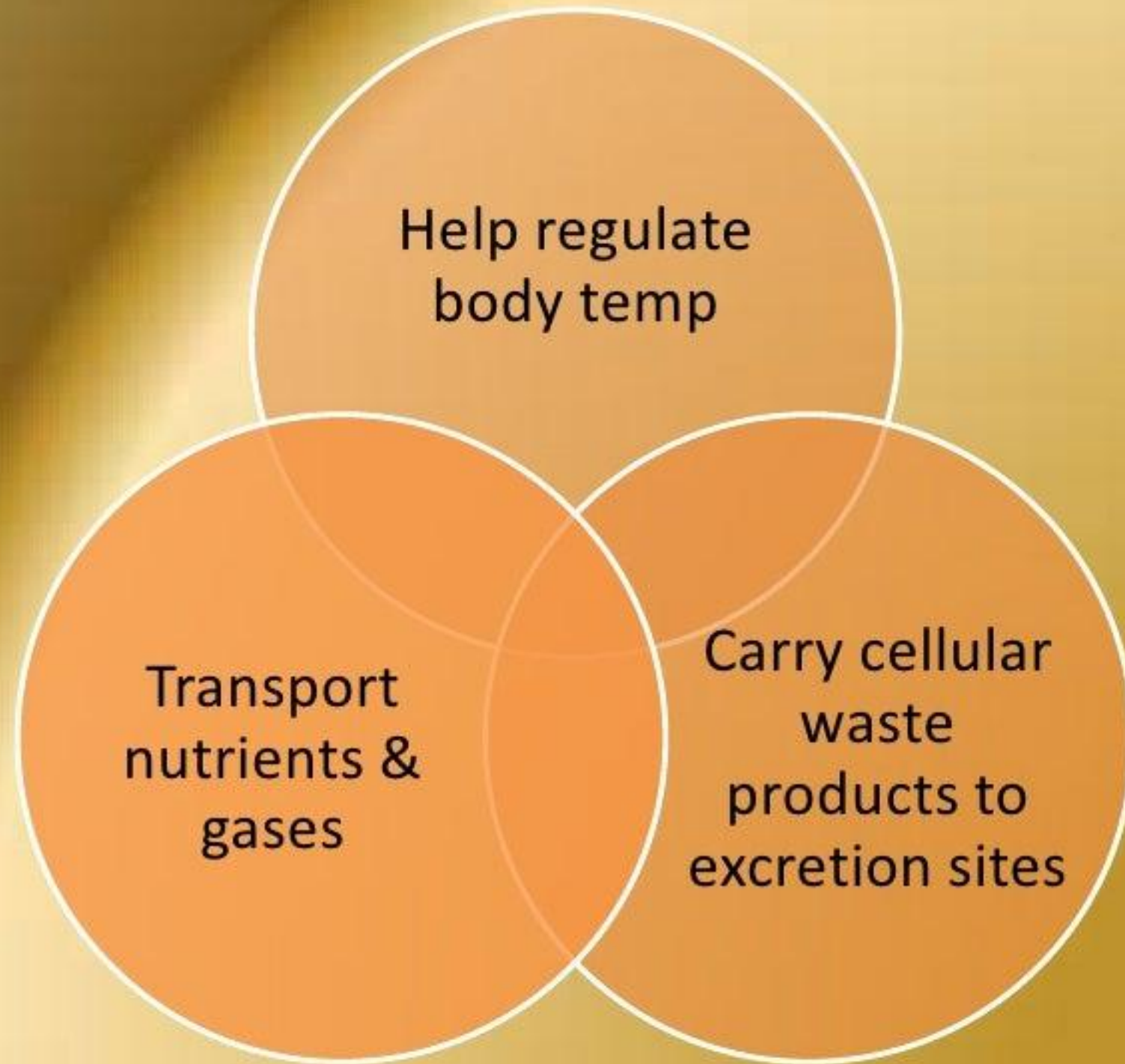
80% total body
weight = infant

Human
body

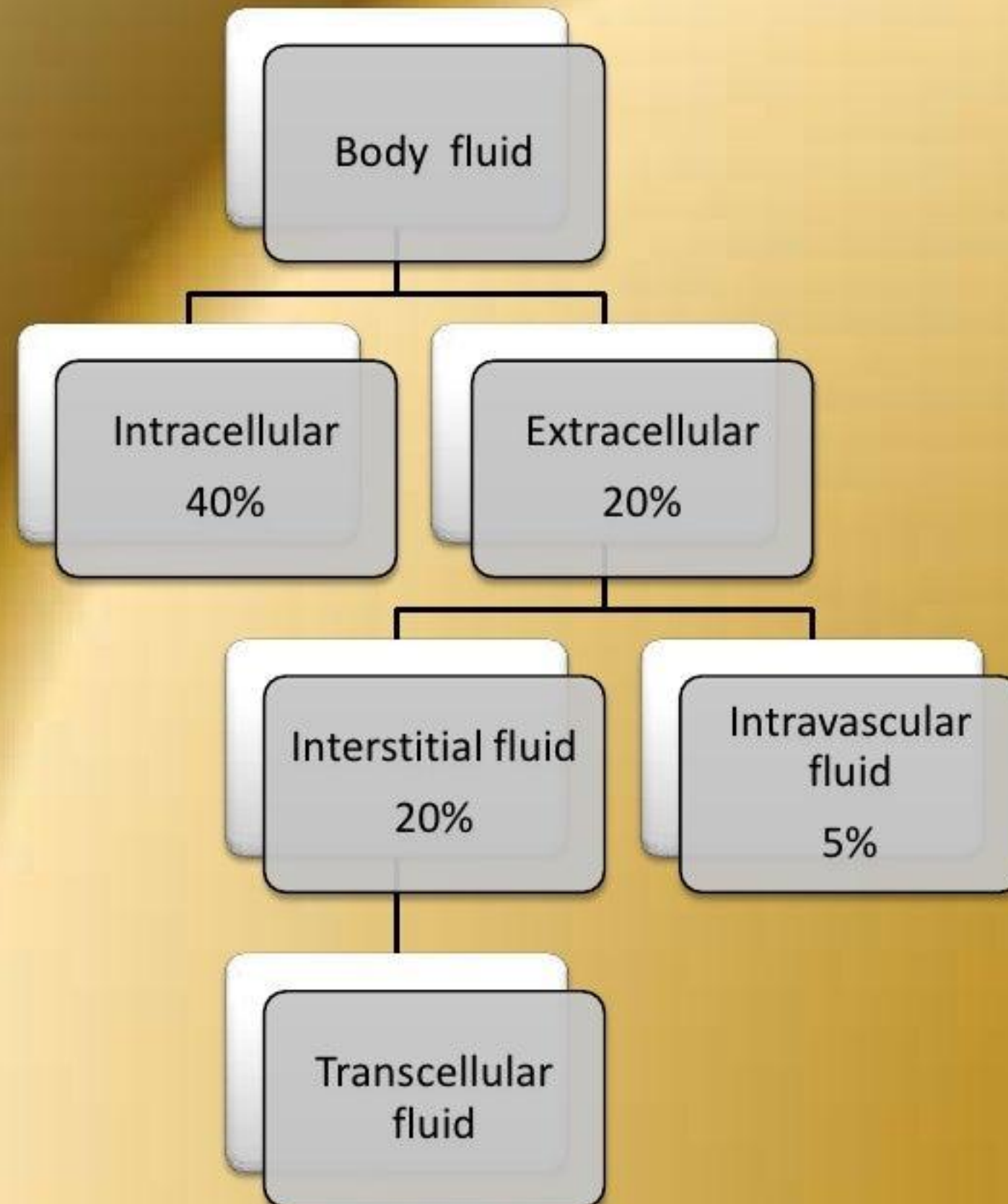
60% total body
weight = 155lbs
(70.3kg)

Body Fluids
= solutes & solvents

FLUID FUNCTIONS



Understanding body fluid distribution



Fluid Balance

kidneys

heart

liver

adrenal
&
pituitary
glands

nervous
system

Balance act

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graph LR; A[Balance act] --- B[Fluid volume]; A --- C[Distribution of fluids in the body]; A --- D[Concentration of solutes in the fluid];
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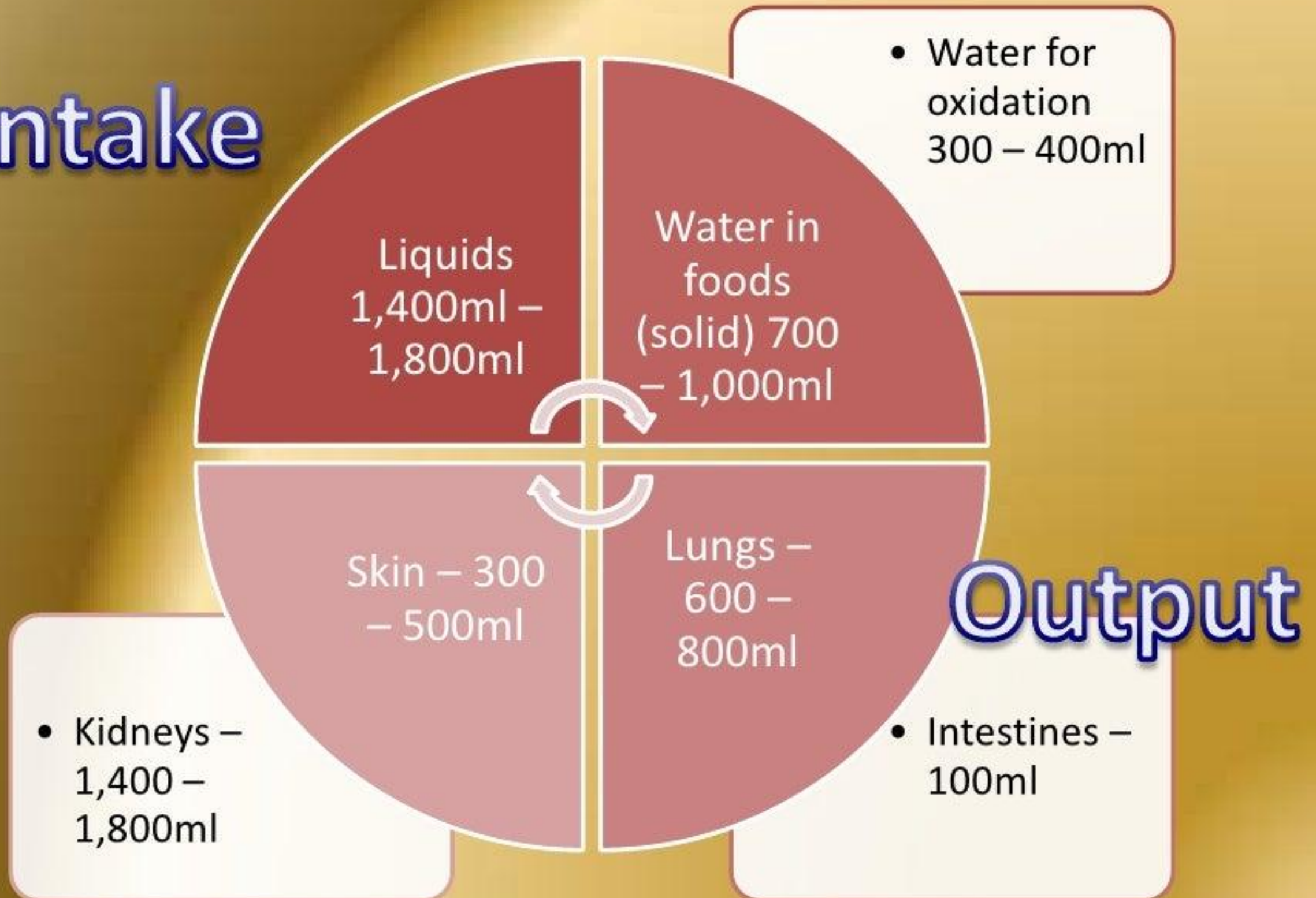
Fluid volume

Distribution of
fluids in the body

Concentration of
solutes in the
fluid

Daily Total Intake & Output 2,400 – 3,200ml

Intake

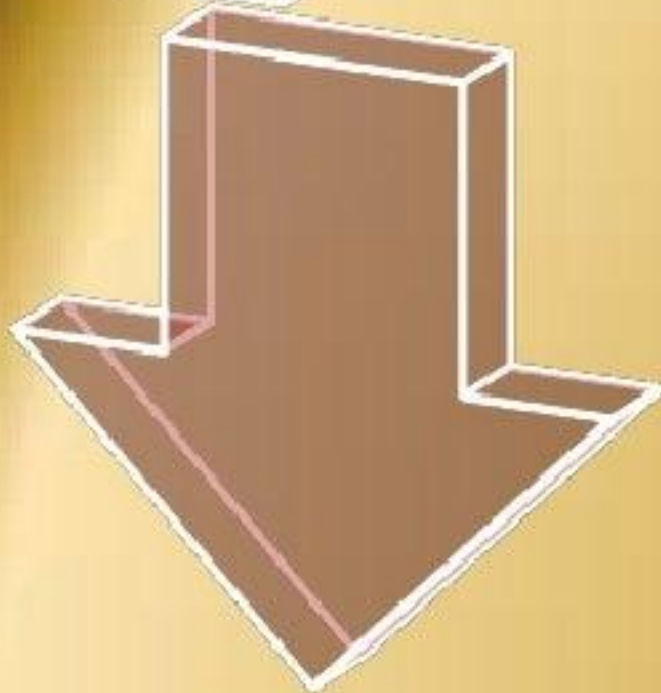




Aldosterone



Potassium



Sodium

Fluid imbalances

Deficit

Weight loss

Thready PR

Sunken eyes, dry
conjunctivae

Poor capillary refill

Excess

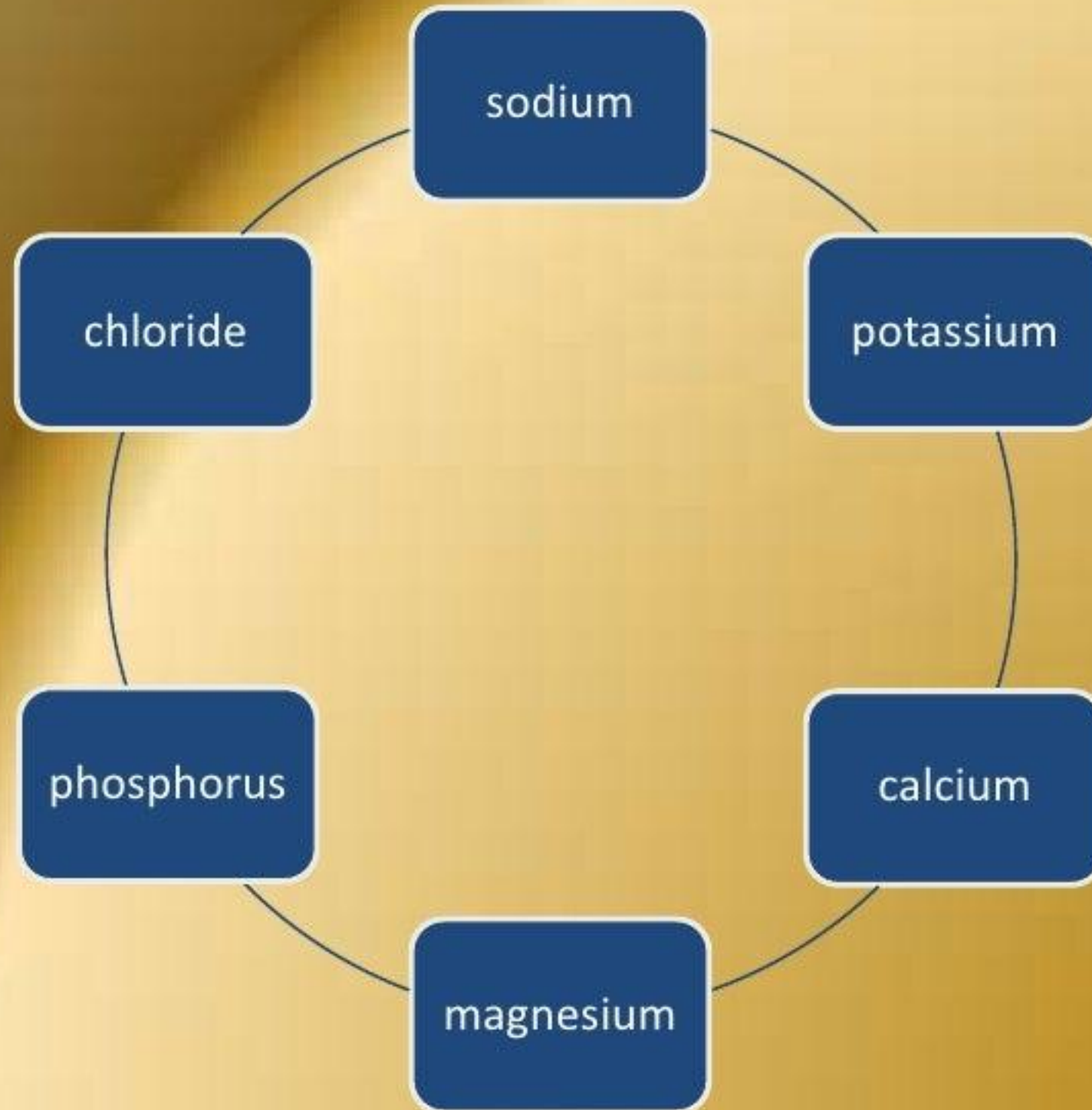
Weight gain

Elevated BP

Bounding pulse

Jugular vein distention

Electrolytes



ELECTROLYTE BALANCE



potassium

phosphorus

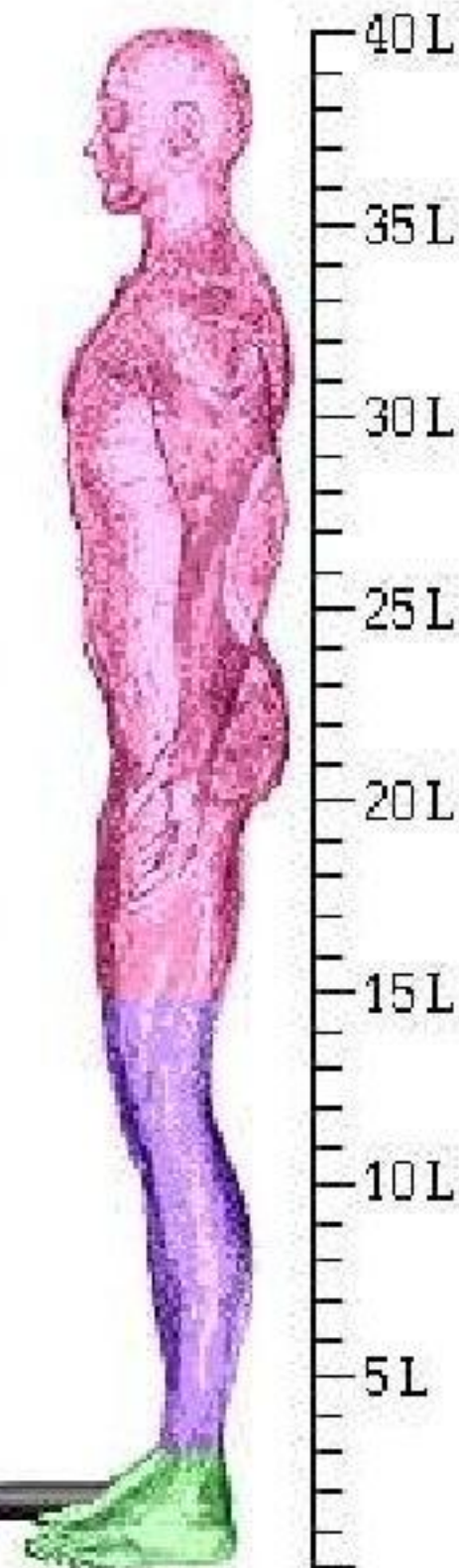
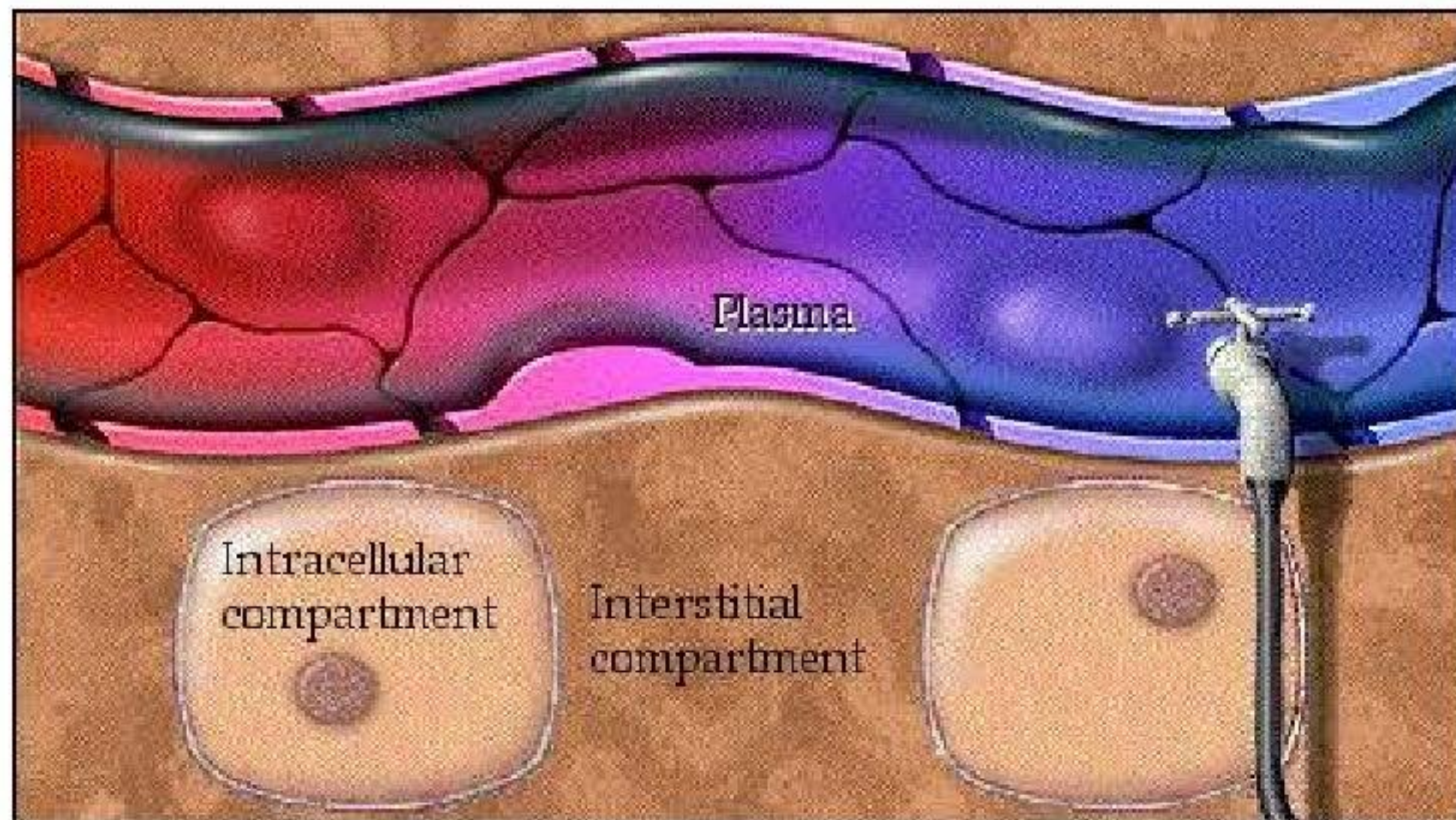


sodium

chloride

FLUID COMPARTMENTS

- Approximately 62% of the body's fluid is intracellular.
- Approximately 30% of the body's fluid is interstitial.
- Approximately 8% of the body's fluid is plasma.



FLUID MOVEMENT

- A mechanism that regulates fluid and electrolyte balance.
- Body fluids are in constant motion.
- Nutrients , waste products, and other substances get into and out of cells, organs, and systems.
- Influenced by membrane permeability and colloid osmotic and hydrostatic pressures.

Solute & fluid molecules

Solutes move
between
compartments

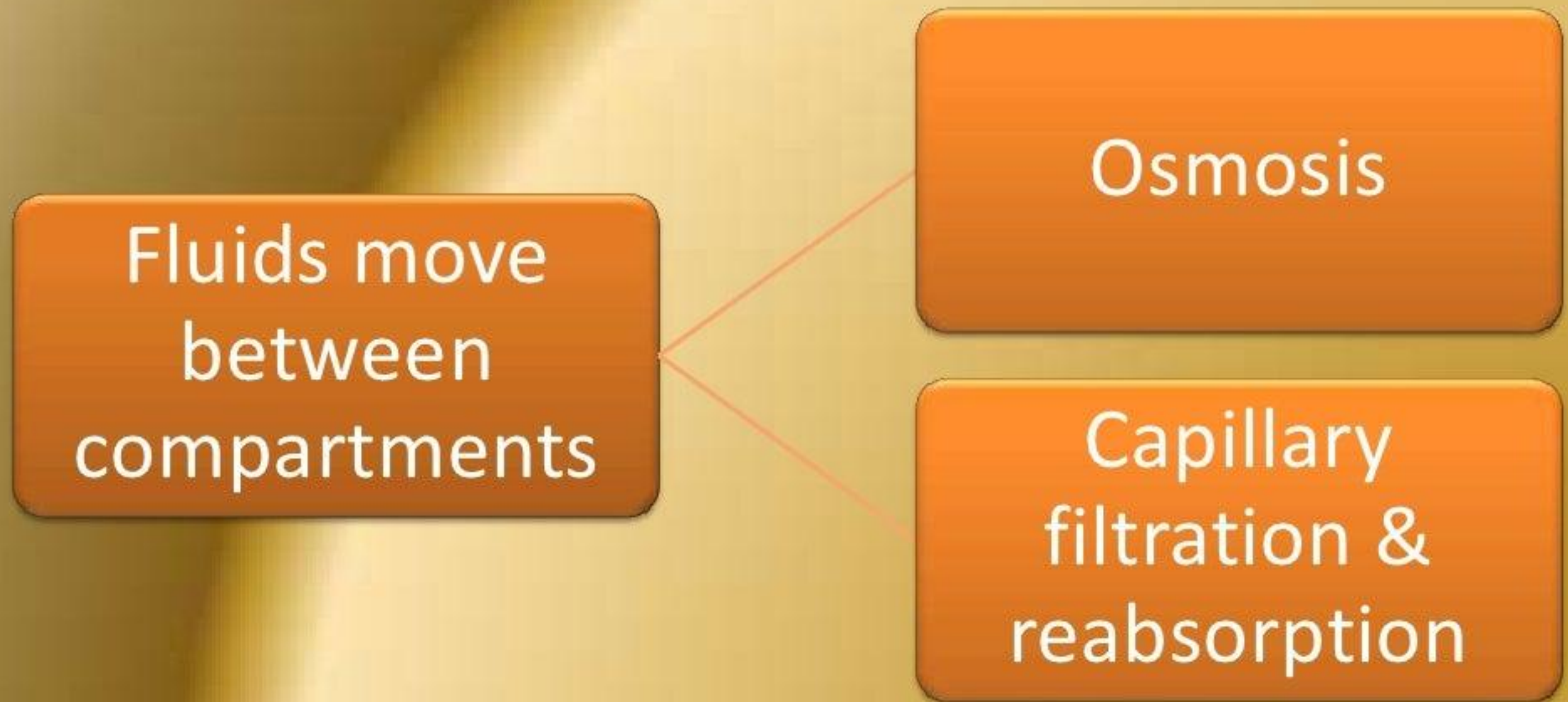


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graph LR; A[Solutes move between compartments] --- B[Diffusion]; A --- C[Active transport]
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Diffusion

Active
transport

Solute & fluid molecules



Areas of high
concentration to
lower concentration

Moving down the
concentration
gradient

Diffusion

Equal distribution of
solute molecules

Passive transport

Areas of lower
concentration to
areas of higher
concentration

Moving against the
concentration
gradient

Active
transport

Requires energy
from adenosine
triphosphate

Moved by
physiologic pumps

Osmosis

- Movement of **water** across a semipemearable membrane from an area of low solute concentration (less concentrated) to an area of high solute concentration (more concentrated).

Capillary filtration and reabsorption

- **Filtration** – movement of substances from an area of high hydrostatic pressure to an area of lower hydrostatic pressure
 - **Hydrostatic pressure** – pressure at any level on water at rest due to weight of the water above it.
 - **Pushes** fluids and solutes through capillary wall pores and into the ISF.
- **Capillary Reabsorption** by the osmotic or pulling force of albumin (**Colloid Osmotic/Oncotic Pressure**)
 - **pulling** force of albumin in the capillaries, attracting water in from the interstitial space