

CH. 25-URINARY SYSTEM

Pages 960-994

Renal A&P

Renal Blood Flow

The Nephron

Urine Formation

Homeostatic Imbalances & Treatment

Analogy of the Urinary System vs. lathered bar of soap

1. The average size of a kidney is equivalent to a bar of soap



2. The kidney filters and 'cleans' the water to be either retained or excreted.



2009- First public case of water intoxication (hyponatremia); Jury awarded her family 16.5 million for wrongful death lawsuit



Water intoxication AKA HYPONATREMIA

The skull has limited room- excess water causes brain swelling → Swollen brain → seizures, coma → respiratory arrest, death

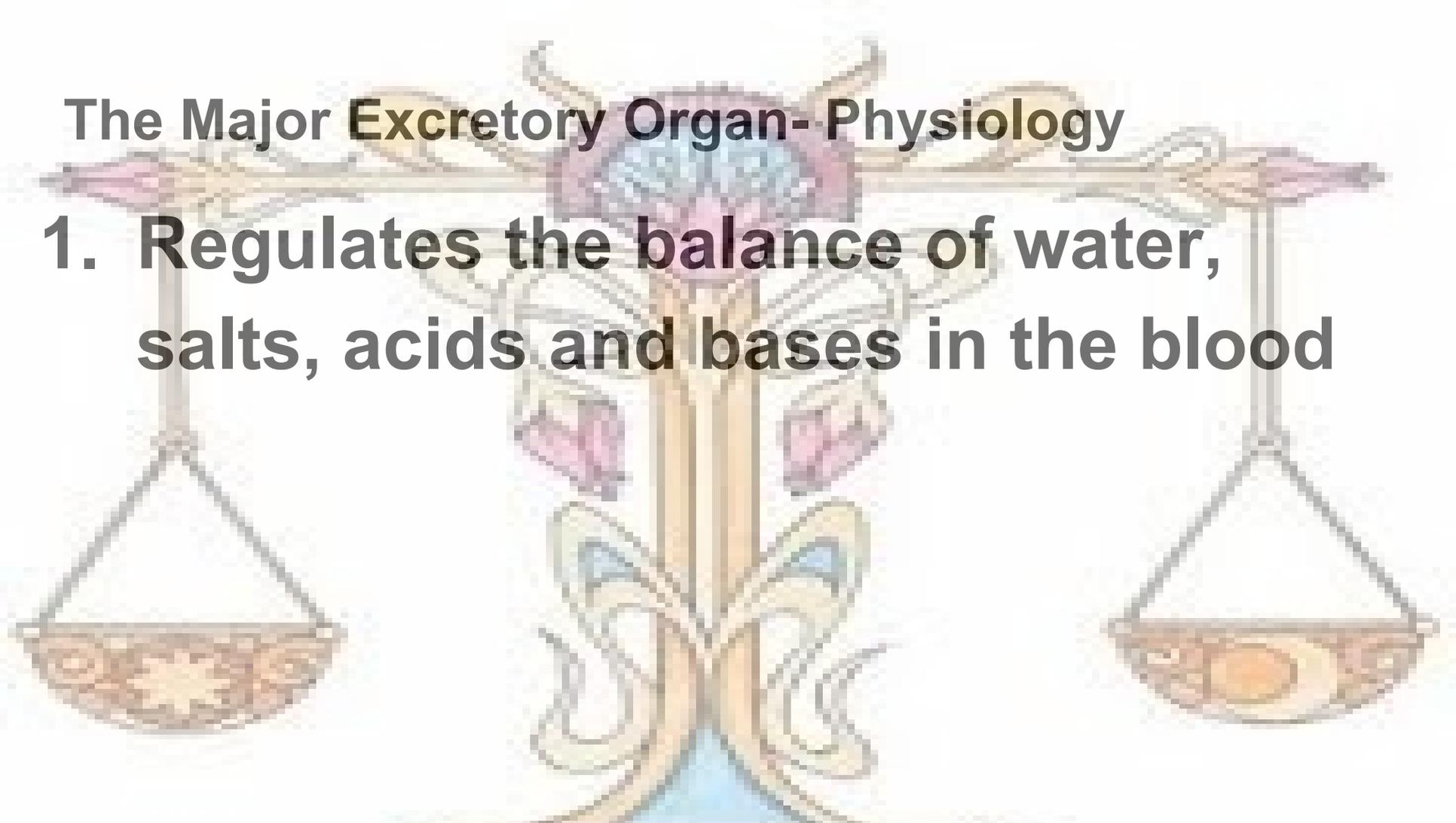
What causes the brain to swell? Too much water and >vasopressin leaves blood and goes into cells

VASOPRESSIN

- *aka ADH (antidiuretic hormone)
- *stimulated by blood volume
- *inhibited by adequate hydration
- *kidneys reabsorb water

The Major Excretory Organ- Physiology

1. **Regulates the balance of water, salts, acids and bases in the blood**



Renal Functions

2. Assists in **GLUCONEOGENESIS**- due to **FASTING**

- **Occurs in the liver**
- **Converts non-glucose molecules into glucose when reserves have been depleted in the blood.**
- **Protects the nervous system from damaging effects of hypoglycemia**

3. HORMONES made by the KIDNEYS

A. Produces RENIN- regulates bp & kidney function

B. Produces ERYTHROPOIETIN- stimulates RBC production

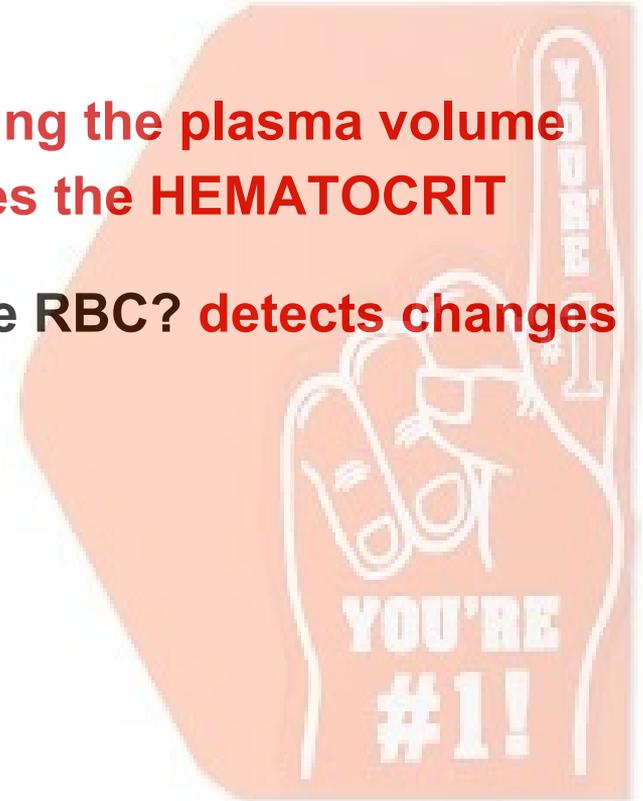
C. Calcitriol- formed in the skin used to strengthen bone by absorbing Ca from food

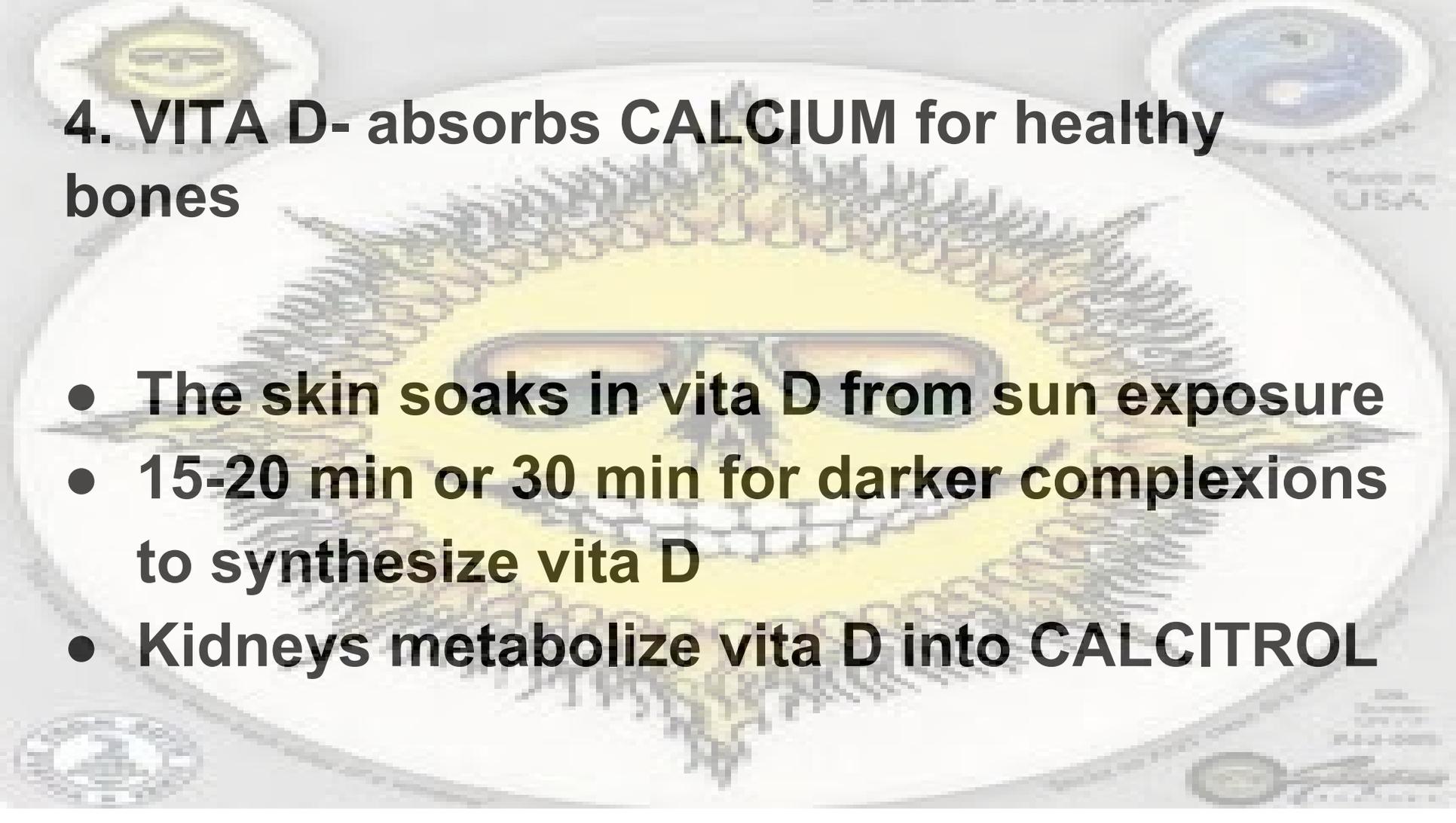
Your hormones

Why are the kidneys an important role in the Circulatory System?

Kidneys regulate blood volume by controlling the plasma volume and in red blood cell mass, which influences the HEMATOCRIT

How are the kidneys signaled to make more RBC? detects changes in tissue oxygen



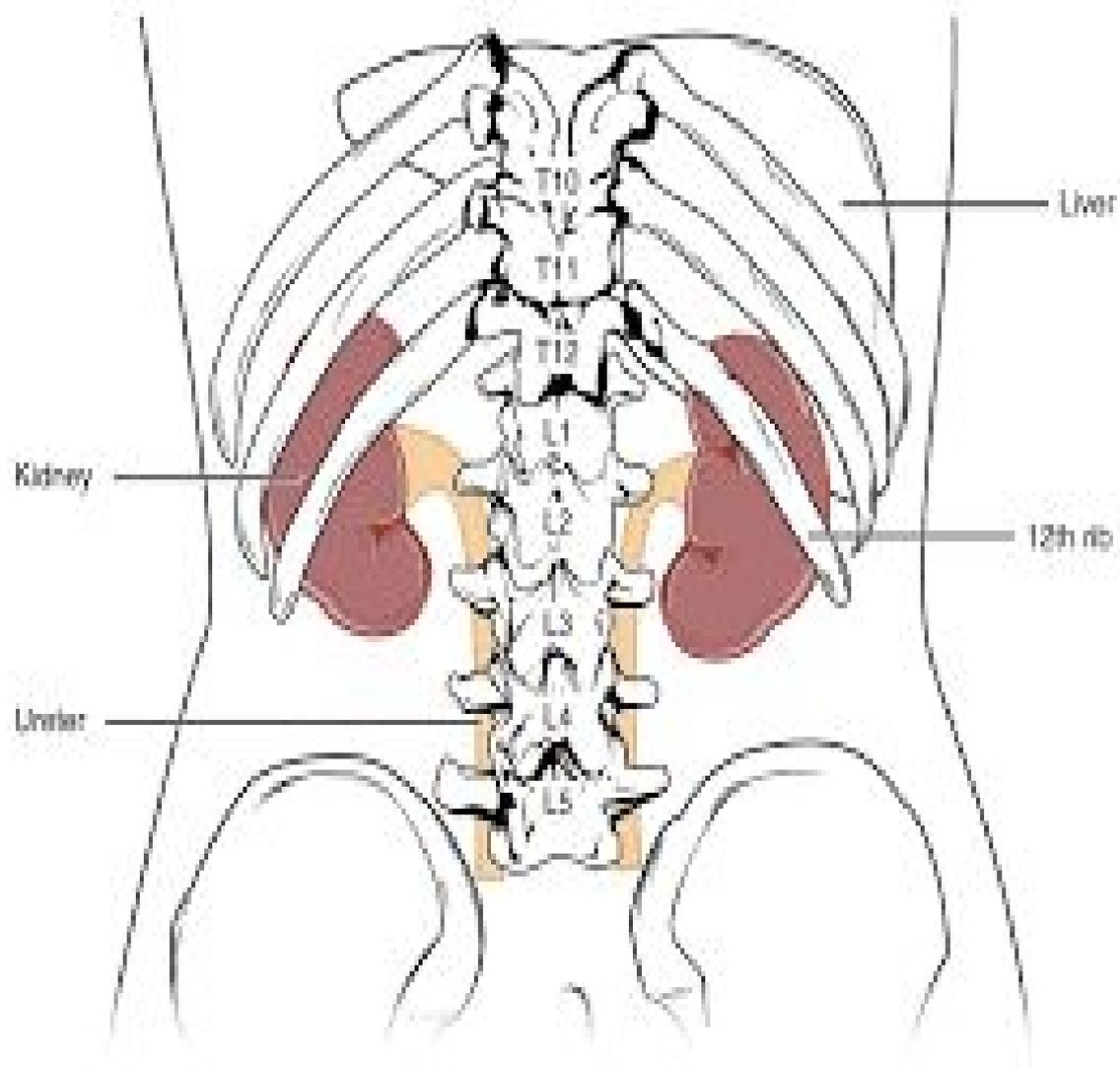


4. VITA D- absorbs CALCIUM for healthy bones

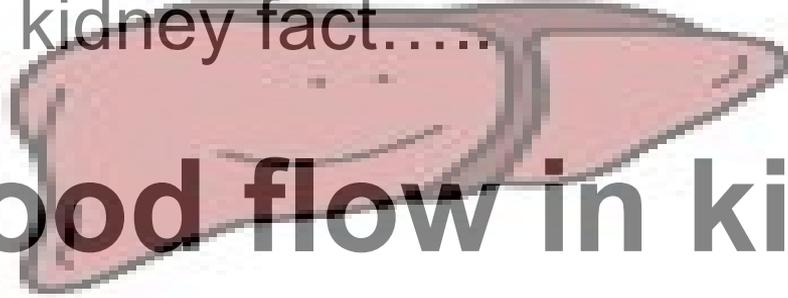
- **The skin soaks in vita D from sun exposure**
- **15-20 min or 30 min for darker complexions to synthesize vita D**
- **Kidneys metabolize vita D into CALCITROL**

POSITION OF THE KIDNEYS

- Superior Lumbar Position
T12 - L3
- Protected by the lower rib cage
- RIGHT kidney is slightly lower than the left
- Adrenal Glands sit on top



Cool kidney fact.....



Blood flow in kidneys is higher than blood flow in the heart, liver and brain

