

# **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**

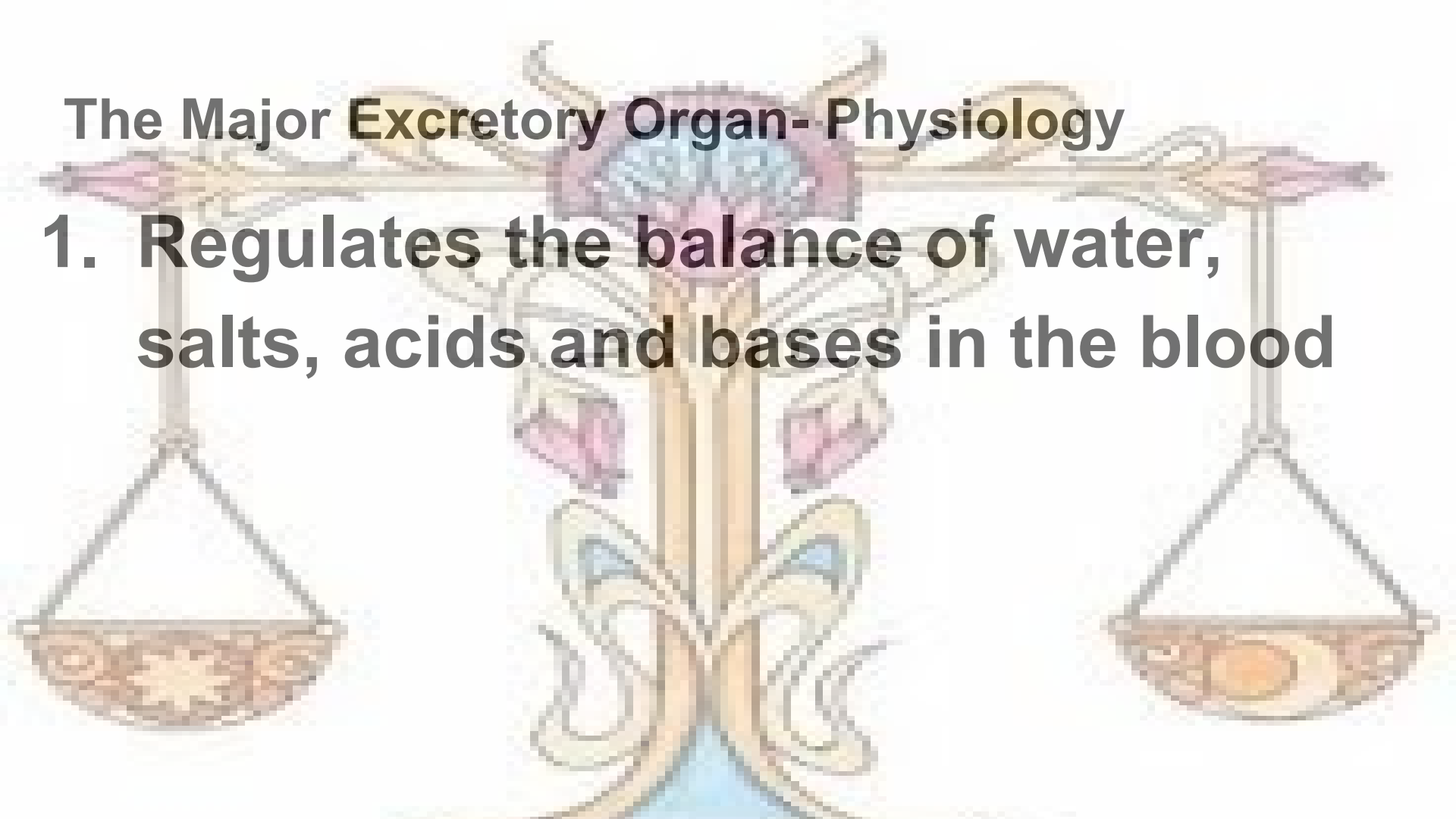
**What causes the brain to swell? Too much water and >vasopressin leaves blood and goes into cells**

# 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

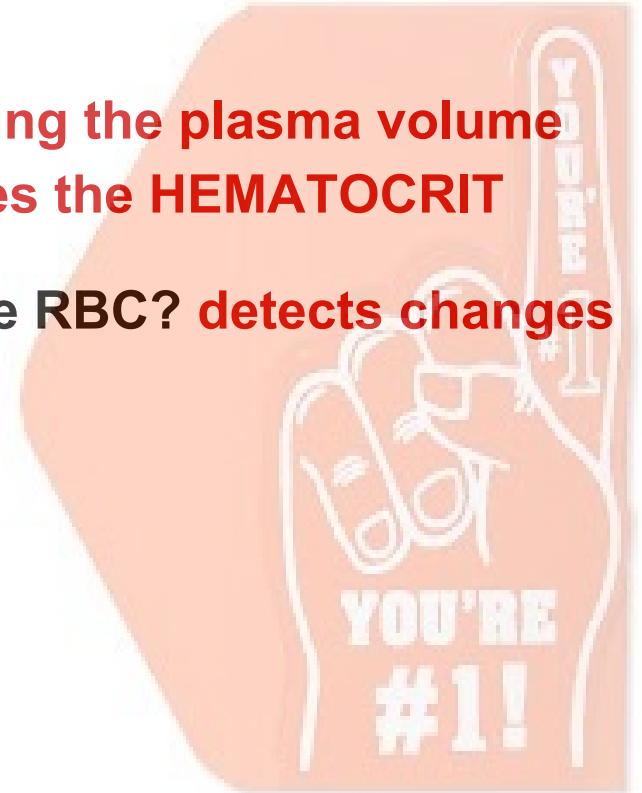
Your hormones



# 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**



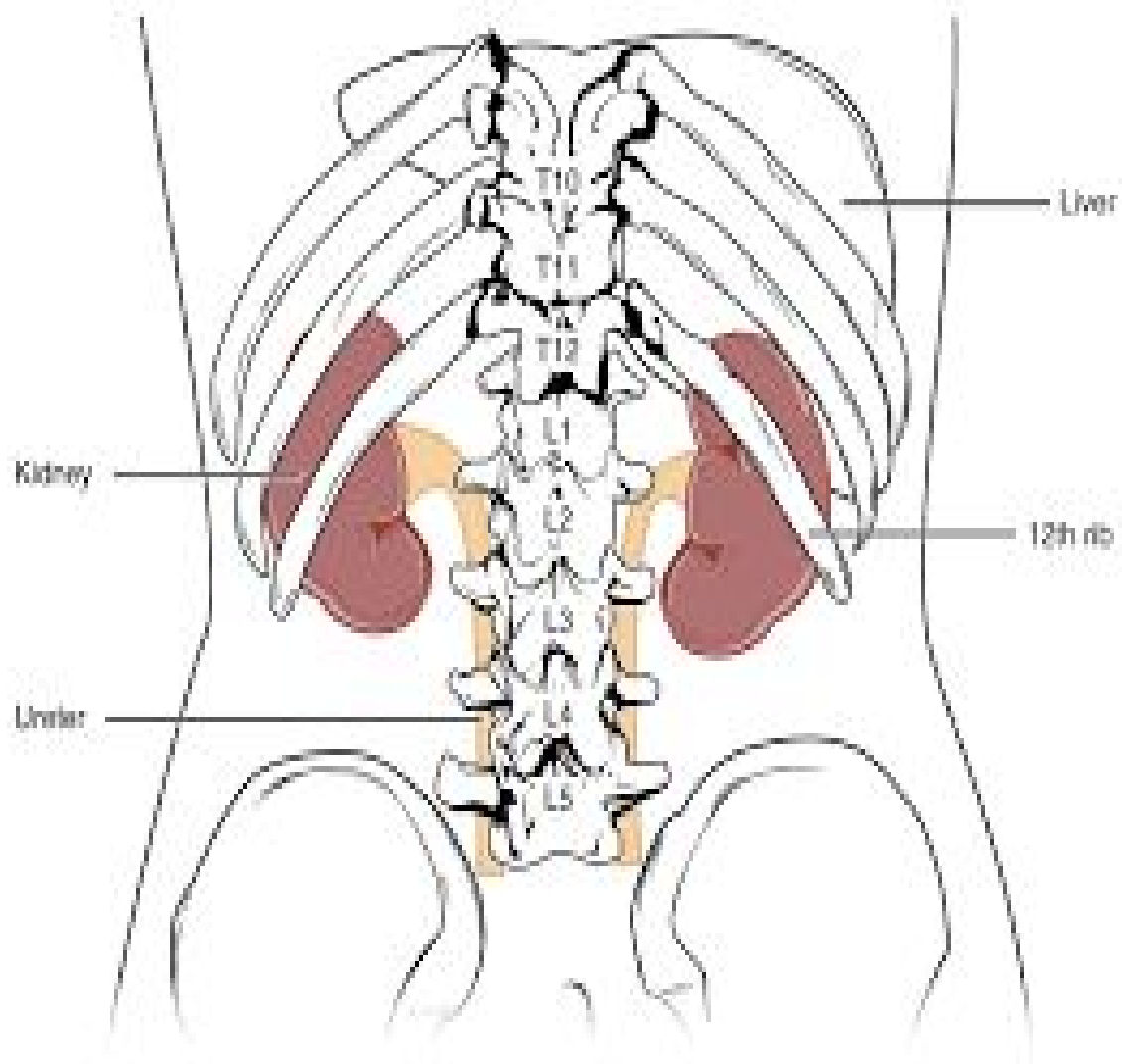


## **4. VITA D- absorbs CALCIUM for healthy bones**

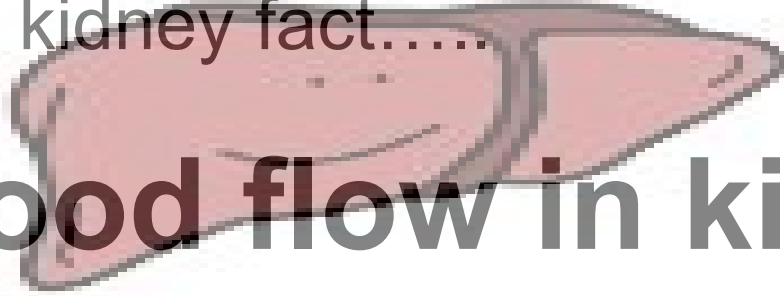
- **The skin soaks in vita D from sun exposure**
- **15-20 min or 30 min for darker complexions to synthesize vita D**
- **Kidneys metabolize vita D into CALCITROL**

# 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**

