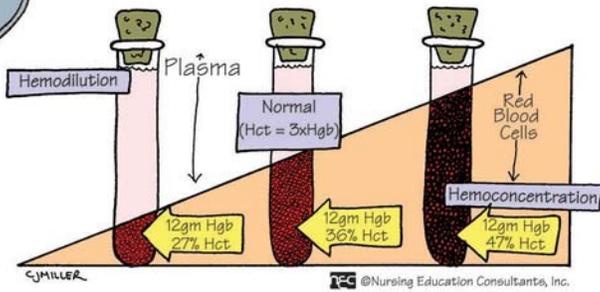
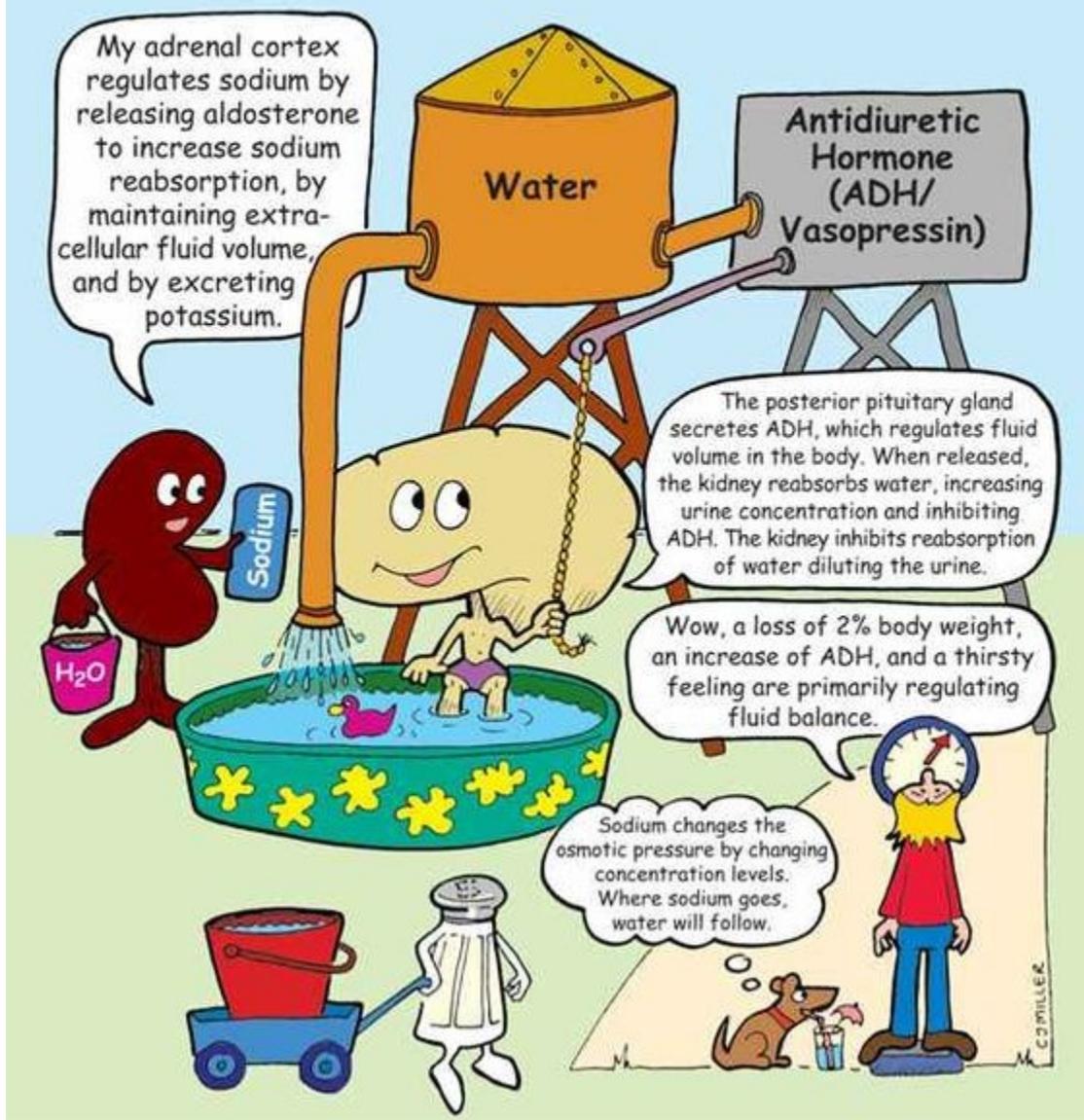


# BASICS OF HYDRATION

USING Hgb & Hct AS A GUIDE TO HYDRATION STATUS



# FLUID BALANCE: A MATTER FOR THE BRAIN AND KIDNEYS



# DEHYDRATION

"NO WATER, NO SALT, OR BOTH"

Vomiting and diarrhea (loss of fluid and electrolytes)

Inadequate fluid intake

Yikes, I'm out of salt and water!

Low-sodium diet or no sodium intake (electrolyte deprivation)

Diabetes insipidus (excessive fluid loss)

Watch for changes in skin turgor, hypovolemia, tachycardia, weak pulse, postural hypotension, and confusion.

Also, watch for thirst, dry skin, sticky or dry mucous membranes, weight loss, and concentrated urine.\*  
\*Except with diabetes insipidus

Dehydration can be caused by sodium or water loss.

Got water? I'm bone dry.

# OVERHYDRATION

## "FLUID VOLUME EXCESS"

Too much fluid going in with failure to eliminate.

### ■ Neurologic

- Changes in LOC
- Confusion
- Headache
- Seizures

### ■ Cardiovascular

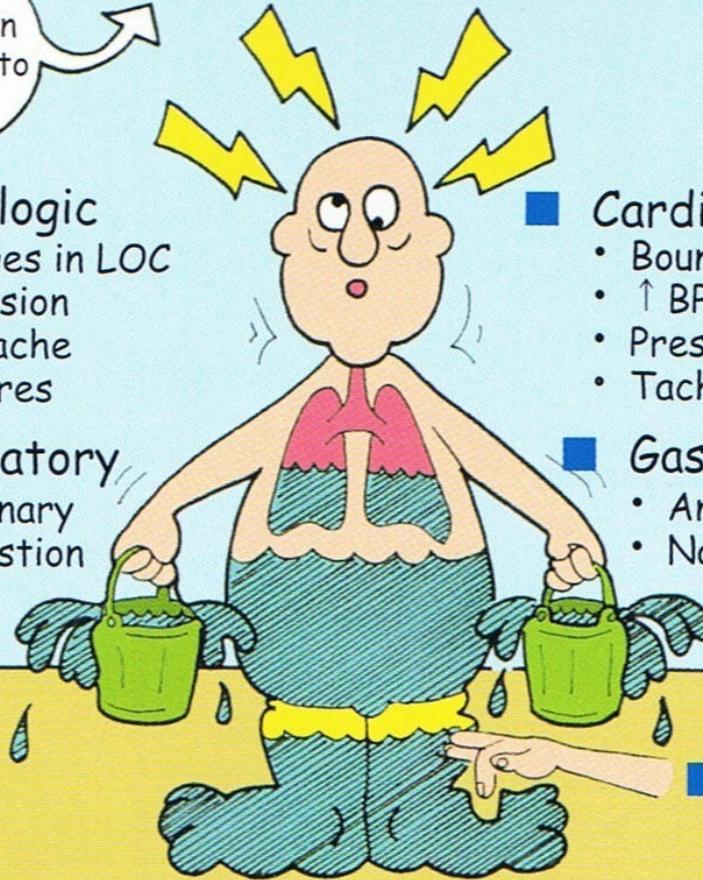
- Bounding pulse
- $\uparrow$  BP  $\uparrow$  JVD
- Presence of S3
- Tachycardia

### ■ Respiratory

- Pulmonary congestion

### ■ Gastrointestinal

- Anorexia
- Nausea



### ■ Edema

- Dependent pitting edema

Sodium concentrations can be decreased, as well as the osmolality, because there is more water than sodium. The hematocrit will be reduced from the dilution of excess water.



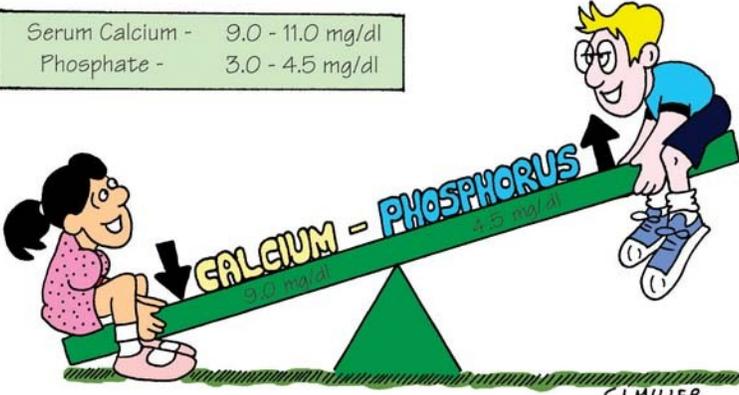
# CALCIUM-PHOSPHORUS

## RELATIONSHIP

- The Ups and Down -

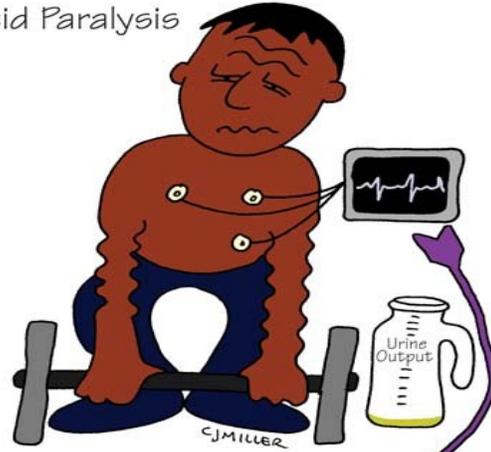


Serum Calcium -	9.0 - 11.0 mg/dl
Phosphate -	3.0 - 4.5 mg/dl



# K<sup>+</sup> ↑ HYPERKALEMIA

- \* Muscle Twitching → Weakness → Flaccid Paralysis
- \* Irritability & Anxiety
- \* ↓ BP
- \* ECG Changes - Tall Peaked T Waves
- \* Dysrhythmias - Irregular Rhythm, Bradycardia
- \* Abdominal Cramping
- \* Diarrhea

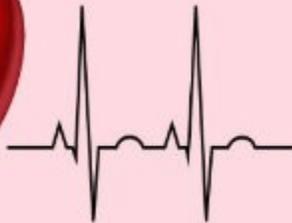


Flat P  
Prolonged P-R  
Wide QRS  
Peaked T

# HYPERKALEMIA SIGNS AND SYMPTOMS

M-U-R-D-E-R

- M-muscle cramps
- U-rine abnormalities
- R-espiratory distress
- D-ecreased cardiac contractility
- E-KG changes
- R-eflexes



[www.nursebuff.com](http://www.nursebuff.com)

**K<sup>+</sup>**  
**POTASSIUM DEFICIT**

- \* **A**lkalosis
- \* **S**hallow Respirations
- \* **I**rritability
- \* **C**onfusion, Drowsiness
- \* **W**eakness, Fatigue
- \* **A**rrhythmias - Irregular rate, Tachycardia
- \* **L**ethargy
- \* **T**hready Pulse
- \* **↓** Intestinal Motility
  - Nausea
  - Vomiting
  - Ileus



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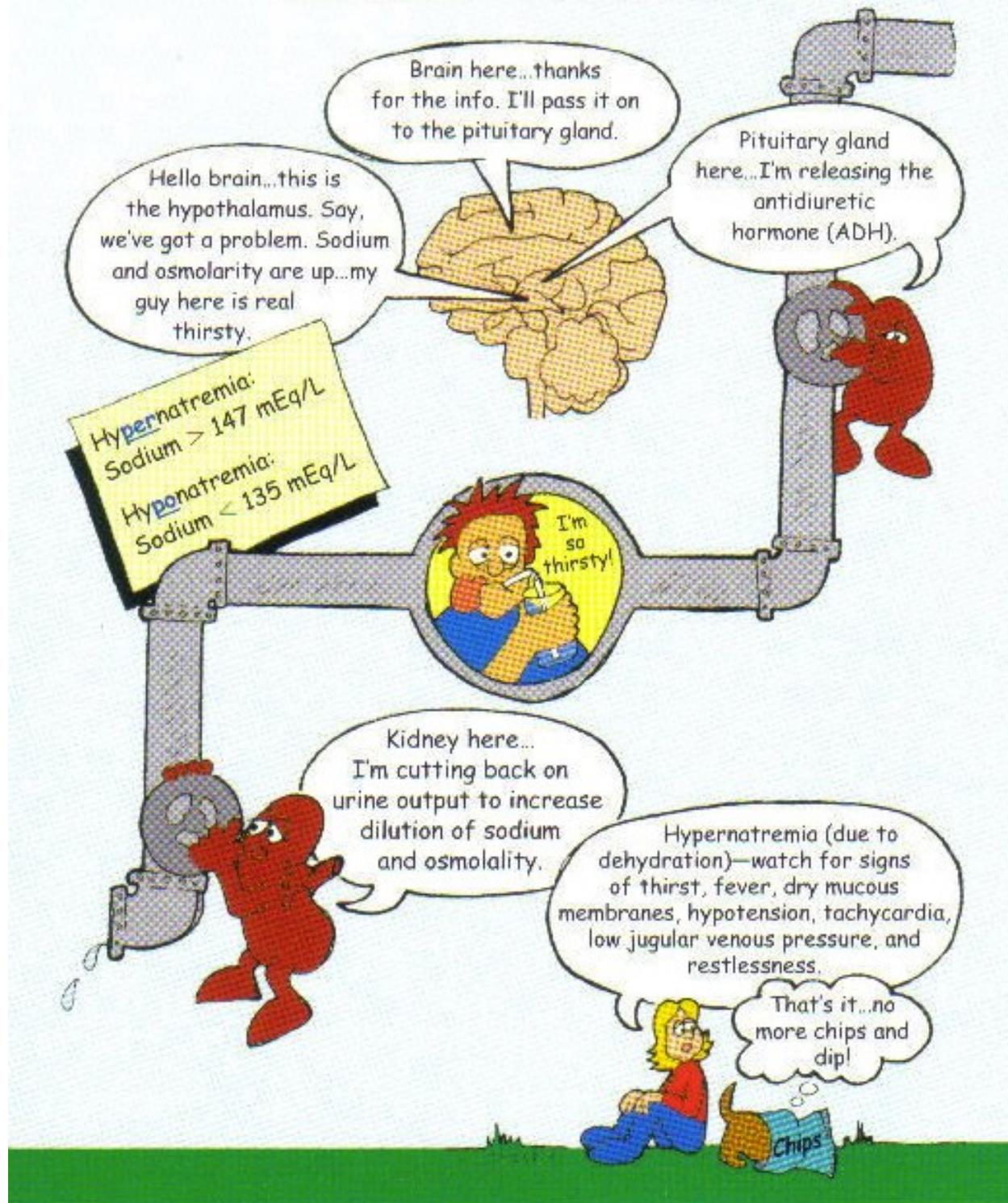
## HYPERNATREMIA

"YOU ARE FRIED"

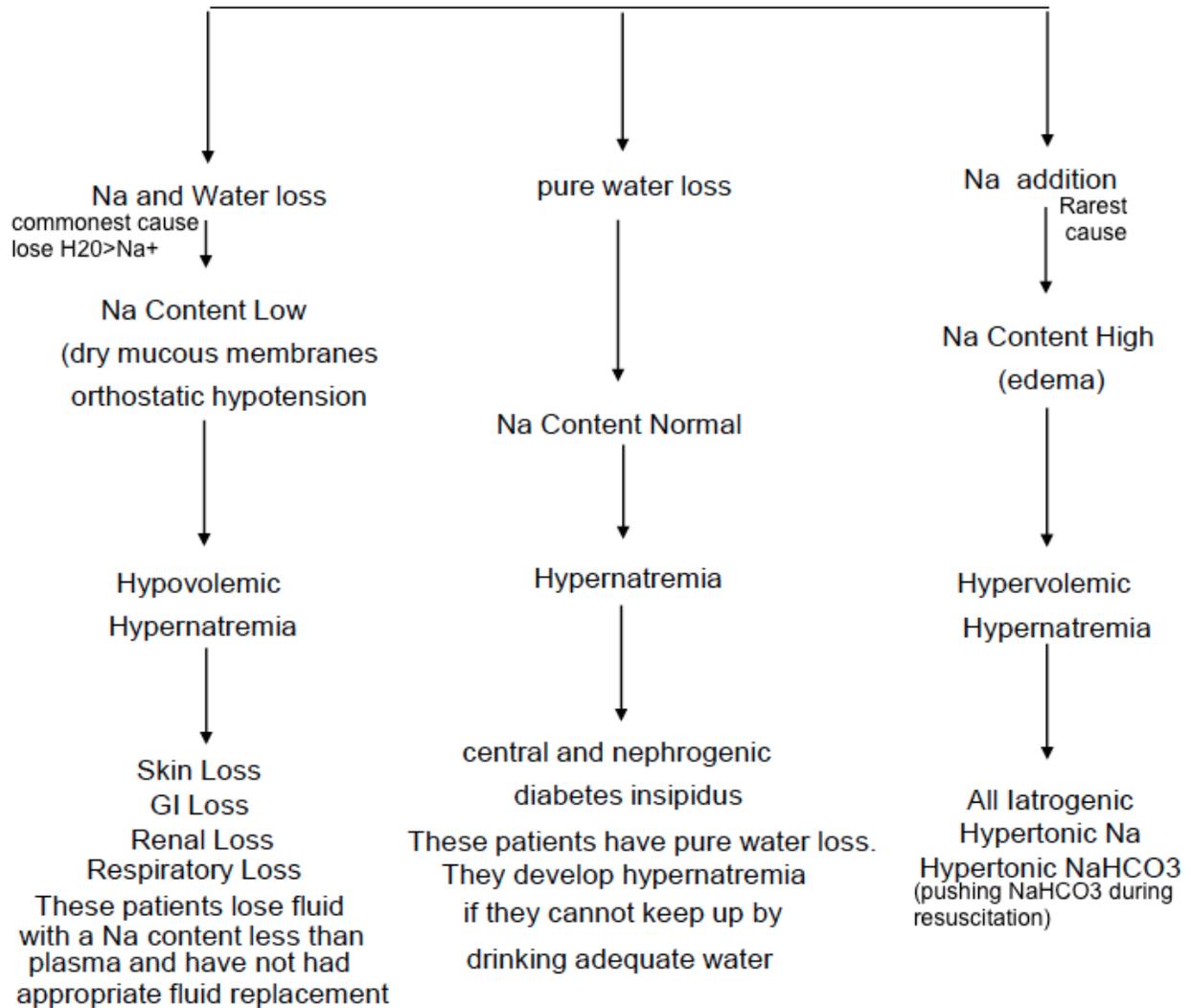
- F** Fever (low grade), flushed skin
- R** Restless (irritable)
- I** Increased fluid retention and  $\uparrow$  BP
- E** Edema (peripheral and pitting)
- D** Decreased urine output, dry mouth



# HYPERNATREMIA



## HYPERNATREMIA



# HYPERNATREMIA

"THE MODEL"  
(Causes of  $\uparrow$  serum sodium)



- M** Medications, meals  
(too much sodium intake)
- O** Osmotic diuretics
- D** Diabetes insipidus
- E** Excessive  $H_2O$  loss
- L** Low  $H_2O$  intake

# HYPONATREMIA

"ALL RIGHT...WHERE DID ALL THE SODIUM GO?"

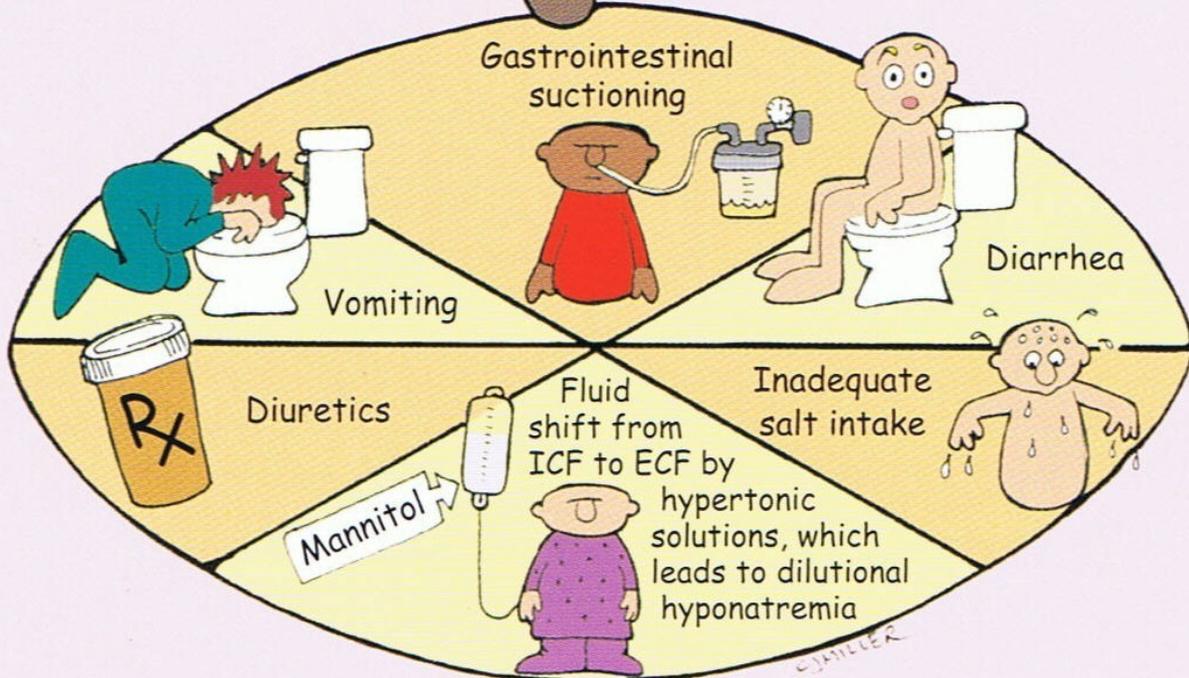
## Signs and Symptoms

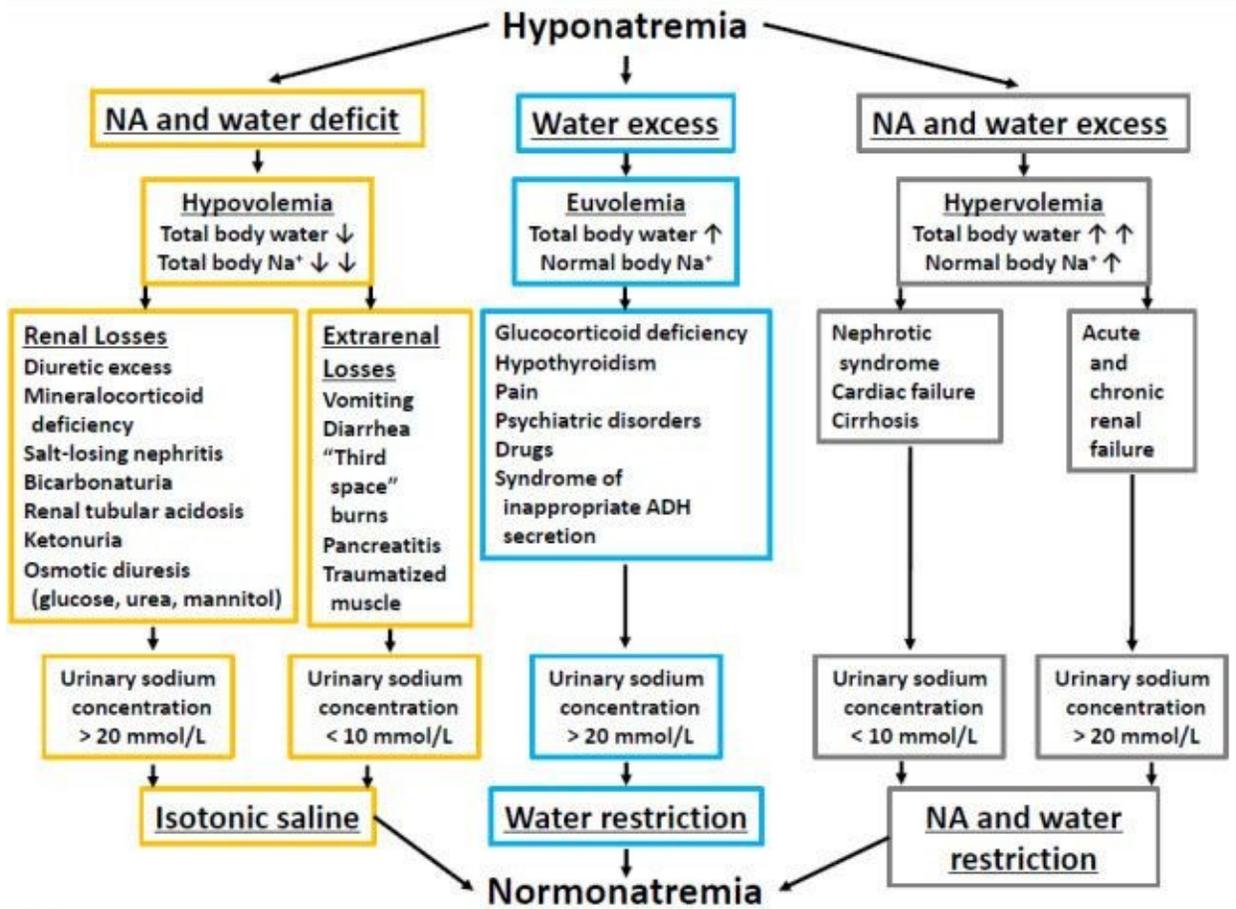
- Lethargy
- Headache
- Confusion
- Apprehension
- Seizures
- Coma

Hyponatremia occurs when serum sodium is less than 135 mEq/L.

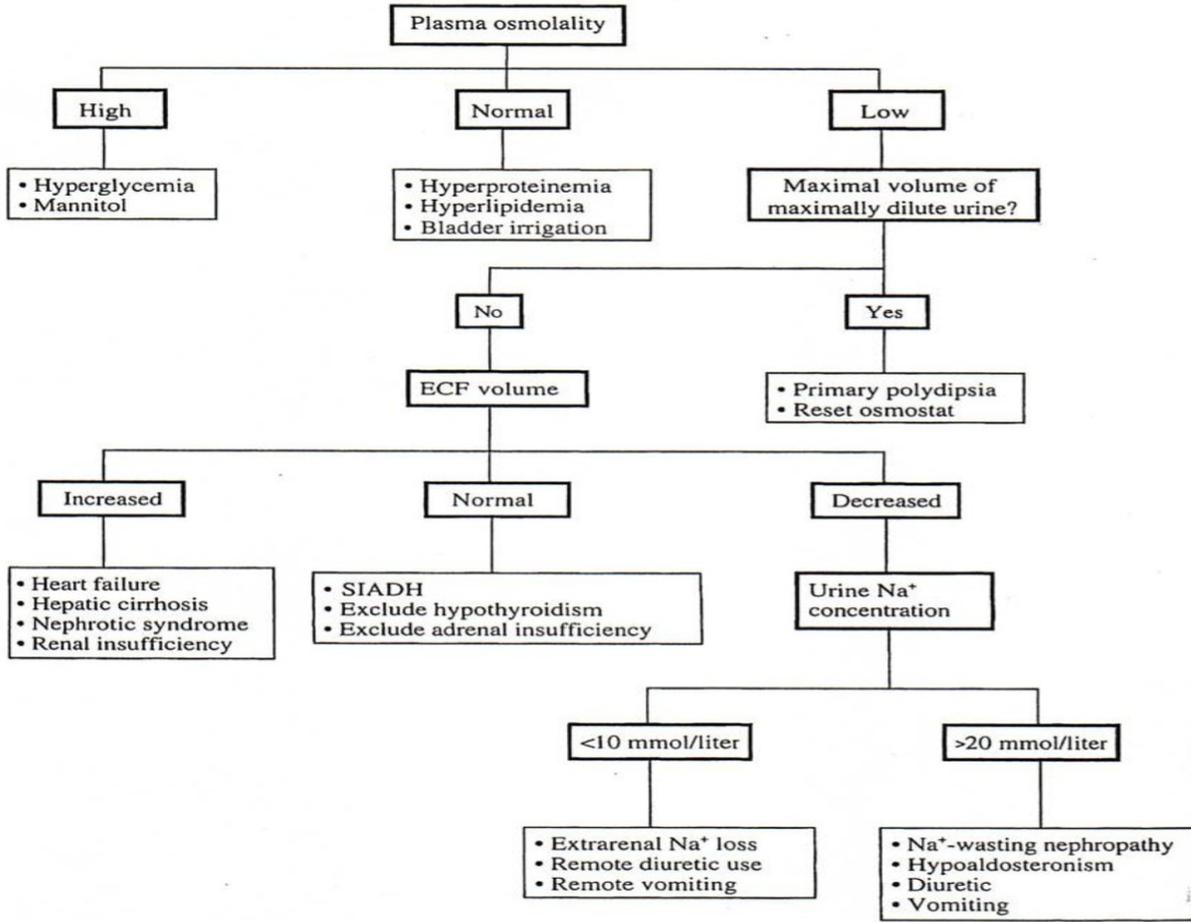
↓ Na is caused by dilution as a result of excess H<sub>2</sub>O or  
↑ Na loss.

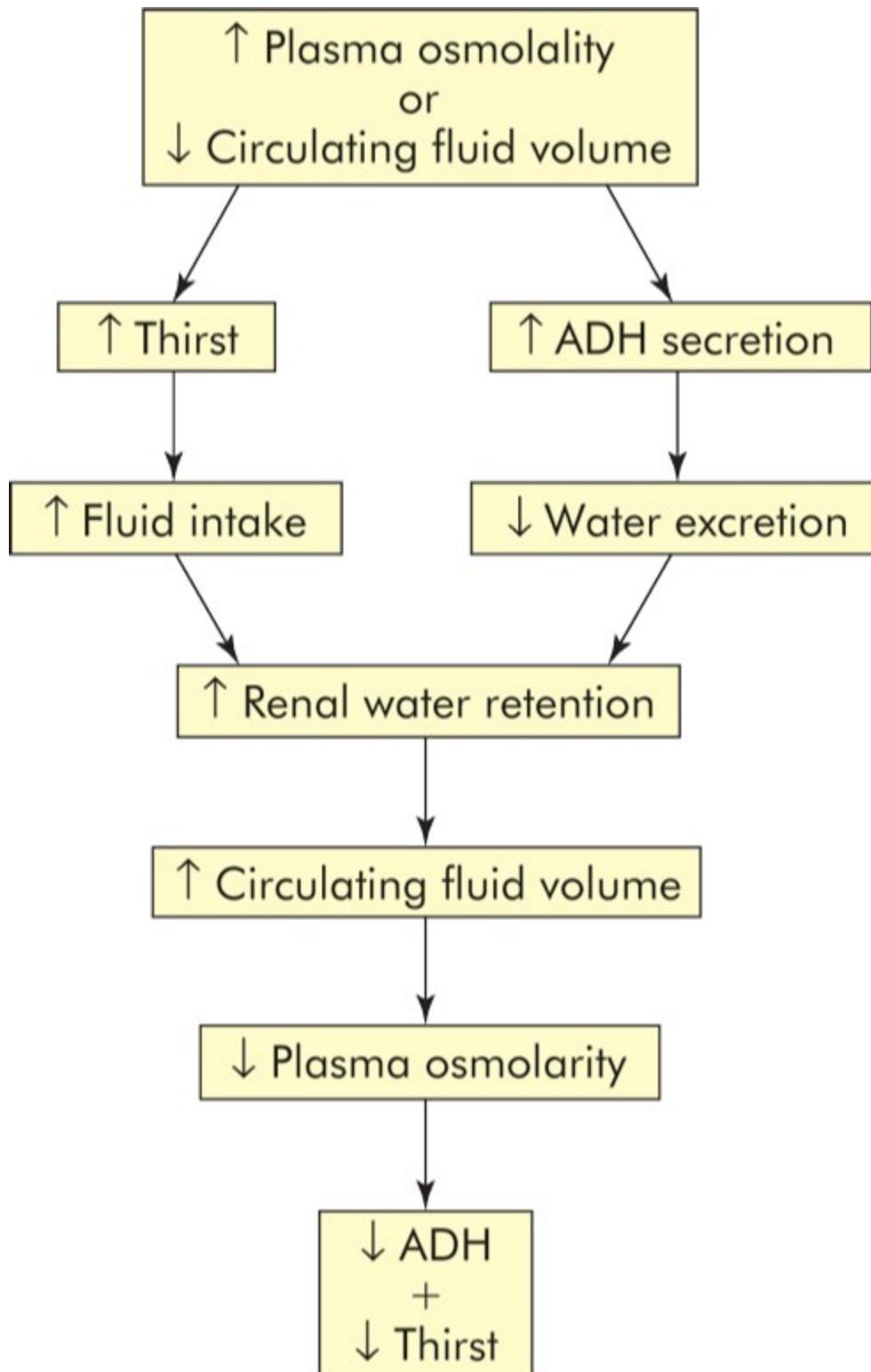
These are some of the situations.





# Hyponatremia flow chart





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## Diabetes Insipidus

- High Urinary Output

- Low Levels of ADH

- Hypernatremia

- Dehydrated

- Lose too much fluid

## SIADH

- Low Urinary Output

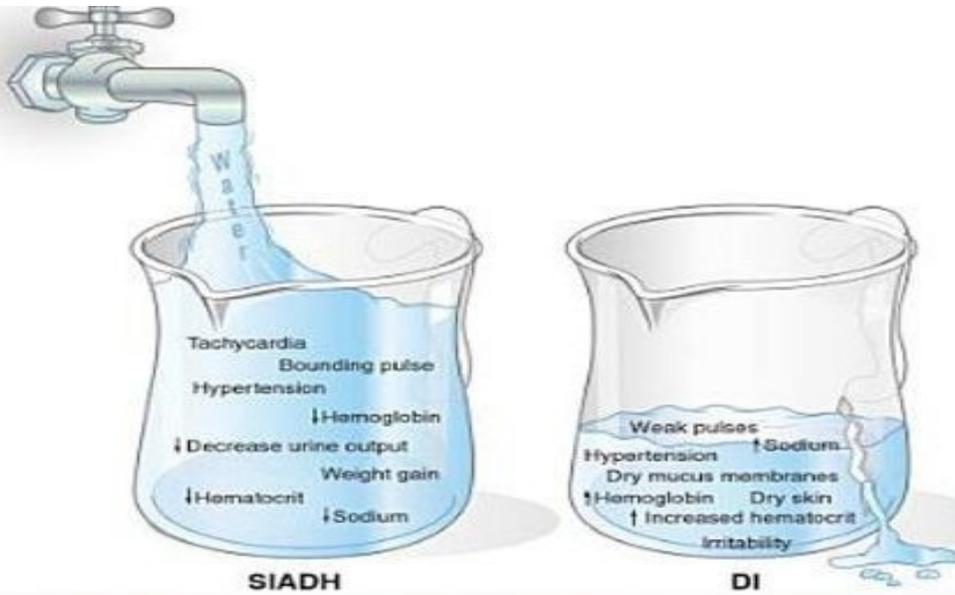
- High Levels of ADH

- Hyponatremia

- Over Hydrated

- Retain too much fluid

VS



## DIABETES INSIPIDUS (DI)

