

# ELECTROLYTE BALANCE REVIEW

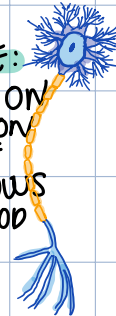
## WATER AND ELECTROLYTES ARE INVERSELY PROPORTIONAL

ALWAYS THINK OF AMOUNT OF ELECTROLYTE CONCENTRATION IN THE BLOOD STREAM INCREASED = TOO MUCH IN THE BLOOD STREAM / TOO LITTLE INSIDE OF THE CELL

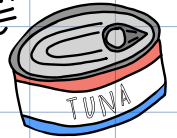
**SODIUM**  
 NA = N/A EMIA  
 THINK OF CNS  
 (NO EKG CHANGES)  
 NO HEART RHYTHM AFFECTED  
 135-145 meq/L



**SODIUM ROLE:**  
 MUSCLE FUNCTION  
 NERVE FUNCTION  
 BLOOD VOLUME (WATER FOLLOWS SODIUM) / BLOOD PRESSURE



**SODIUM REGULATION:**  
 FOOD AND DRINK  
 SWEAT  
 URINE

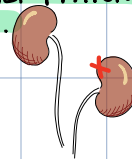


## HYponatremia:

DECREASED SODIUM CONCENTRATION IN THE BLOOD STREAM



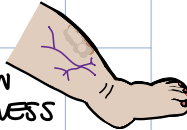
**MOST COMMON IN HOSPITALIZED PATIENTS (BECAUSE OF INCREASED BLOOD VOLUME) CONGESTIVE HEART FAILURE / RENAL FAILURE.**



**HYPERnatremia:**  
 > 160 (DANGEROUS)

DEHYDRATION  
 DIARRHEA

**S/S:**  
 FLUSH SKIN  
 RESTLESSNESS  
 INCREASED DTRS  
 EDEMA  
 DECREASED URINE OUTPUT  
 SLEEPY  
 LOW GRADE FEVER



## S/S:

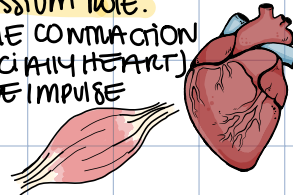
STUPOR / COMATOSE (BRAIN CELL SWELLING)  
 ANOREXIA  
 TENDON REFLEXES DIMINISHED  
 ORTHOSTATIC HYPOTENSION  
 LIMB MUSCLE STIMULATED CRAMPS



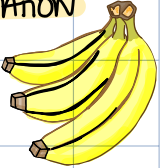
@FISIOMAE PTHUSNE 2022

**POTASSIUM**  
 K+ K/EMIA  
 K/EMIA (SUFFIX)  
 THINK OF HEART  
 3.5-5 meq/L

**POTASSIUM ROLE:**  
 MUSCLE CONTRACTION (SPECIALLY HEART)  
 NERVE IMPULSE



**POTASSIUM REGULATION:**  
 FOOD INTAKE / URINE



**HYPERK/EMIA**  
 (ADDISON'S DISEASE)

## CAUSES:

BURNS (DAMAGE CELLS RELEASE K+)  
 ADRENAL INSUFFICIENCY (NOT PRODUCING ALDOSTERONE)  
 EXCESSIVE K+ INTAKE  
 DRUGS (K+ SPARING)

**S/S:**  
 MUSCLE WEAKNESS  
 (POOR NERVE CONDUCTION)  
 DISFUNCTION NA+/K+ PUMP  
 Prolonged PR SEGMENT  
 DECREASE CARDIAC CONTRACTILITY  
 LETHAL CARDIAC ARYTHMIAS.

**HYPOK/EMIA:**  
 < 2.5 (CRITICAL)

**CAUSE:** DRUGS (LAXATIVE)  
 K+ WASHING  
 DIURETICS  
 INADEQUATE INPUT OF K+  
 TOO MUCH WATER INTAKE

**S/S:**  
 LEGS CRAMPS  
 LETHAL CARDIAC CHANGES  
 SLOW DIGESTION  
 LOW AMPLITUDE DTRS  
 LIMB MUSCLES SHALLOW RESPIRATIONS



**CALCIUM**  
 8.6 TO 10 mg/dL

**CALCIUM ROLE:**  
 BONE & TEETH HEALTH  
 MUSCLE FUNCTION  
 CALCIUM BLOCK THE ENTRANCE OF SODIUM TO THE HEART CELLS TO INHIBIT DEPOLARIZATION (CONTRACTION)  
 NERVE FUNCTION

**CALCIUM REGULATION:**  
 ABSORBS IN THE GI SYSTEM  
 REGULATED BY PARATHYROID GLAND

**HYPOCALCEMIA**  
 LOW LEVEL OF CALCIUM  
 ALLOW SODIUM TO QUICKLY ENTER THE CELLS (MORE ACTION POTENTIAL)

**MOST COMMON CAUSES:**  
 HYPOPARATHYROIDISM  
 CELLACI CHRONIC DISEASE  
 LOOP DIURETICS  
 LOW VITAMIN D LEVEL

**S/S:**  
 CONFUSION  
 REFLEXES ARE DECREASED  
 MUSCLE SPASM  
 ⊕ MOUSSEAU SIGN

< 2 mg/dL  
 CRITICALLY LOW

**HYPERCALCEMIA**

**S/S:** MUSCLE WEAKNESS  
 EKG CHANGES  
 ABSENT REFLEX  
 KIDNEY STONE