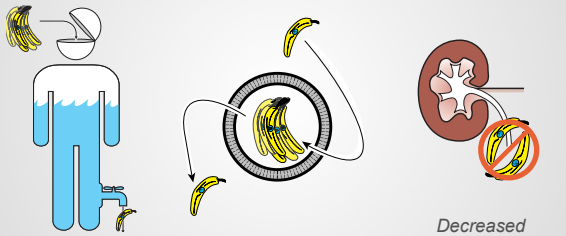
Hyperkalemia

Extracellular shift

Three causes of hyperkalemia

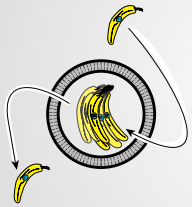


Increased intake

Extracellular shift

Decreased potassium excretion

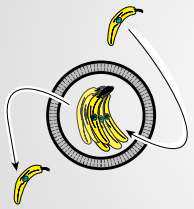
Extracellular shift



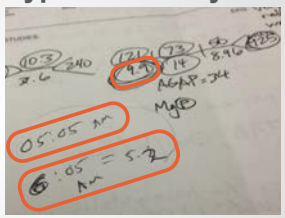
Extracellular shift

Hyperosmolality	DKA and hyperglycemia
Cell destruction	Rhabdomyolysis
	Tumor lysis syndrome
Drugs	Beta blockers
	Digoxin
	Succinylcholine
Acidemia	

Extracellular shift: Hyperosmolality

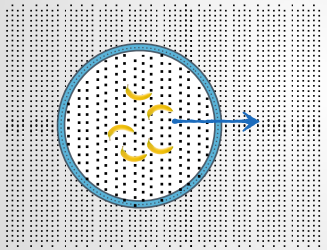


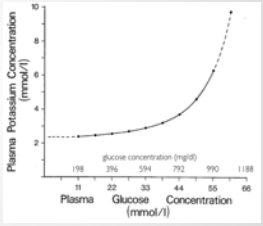
Extracellular shift



Na	Cl	BUN	glucose
K	CO_2	Cr	

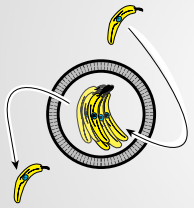
Extracellular shift: Hyperosmolality





Int Urol Nephrol. 2011 Jun;43(2):451-9
Int J Artif Organs. 2005 Mar;28(3):229-36.

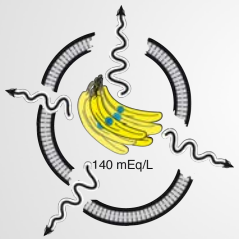
Extracellular shift



Extracellular shift

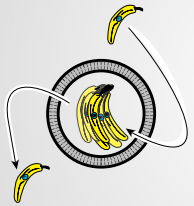
Hyperosmolality	DKA and hyperglycemia
➡ **Cell destruction**	Rhabdomyolysis
	Tumor lysis syndrome
Drugs	Beta blockers
	Digoxin
	Succinylcholine
Acidemia	

Extracellular shift: tissue destruction



- Trauma
- Tumor lysis syndrome
- Hypothermia
- Hemolysis

Extracellular shift



Extracellular shift

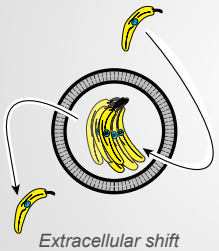
Hyperosmolality DKA and hyperglycemia

Cell destruction Rhabdomyolysis; Tumor lysis syndrome

➡ **Drugs** Beta blockers; Digoxin; Succinylcholine

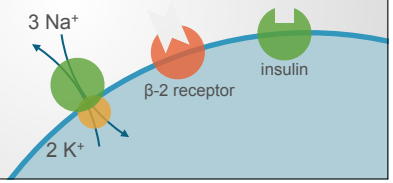
Acidemia

Extracellular shift: Digoxin

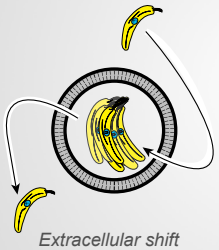


Extracellular shift

Digoxen poisons the Na-K-ATPase



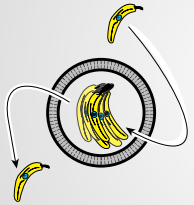
Extracellular shift: Succinylcholine



Extracellular shift

Paralytic agent used for anesthesia and intubation

Extracellular shift

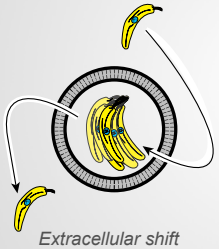


Extracellular shift

Hyperosmolality	DKA and hyperglycemia
Cell destruction	Rhabdomyolysis
	Tumor lysis syndrome
Drugs	Beta blockers
	Digoxin
	Succinylcholine

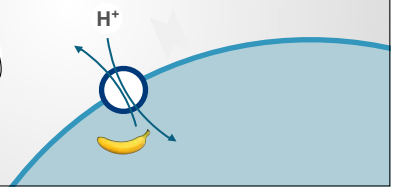
➡ **Acidemia**

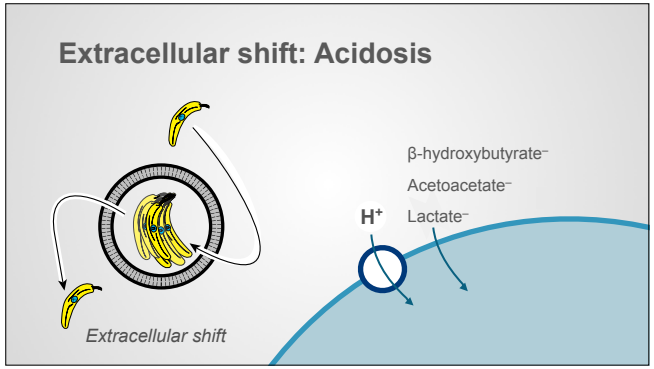
Extracellular shift: Acidosis



Extracellular shift

With some acidosis, hydrogen ions go into the cell, and potassium goes out




Extracellular shift: Acidosis
β-hydroxybutyrate⁻
Acetoacetate⁻
H⁺
Lactate⁻
Extracellular shift