

Renal Vignettes

Potassium Regulation- Response to Normal Dietary K+ Intake

HUMAN vignettes are brief, highly targeted exercises aimed at reinforcing single basic physiological points. The student may then continue to explore by further modifying the experimental design as they wish.

Final K⁺ balance is largely achieved by regulation of the K⁺ secreting aldosterone sensitive principal cells of the late distal and cortical collecting tubules. These cells reabsorb Na⁺ in exchange for K⁺ secretion and are under aldosterone regulation

Below we leave dietary K⁺ intake at its normal value and then monitor the K⁺ excretion response to determine the effectiveness of excretory response. [Further discussion of this topic can be found in Guyton 365-71 and accompanying figs.].

Below please find the experimental protocol to carry out this investigation. [Note well that *you should understand each of the variables employed*; use Help info on: or from a Help screen pick the View summary of [all variables](#) link.]

View Output:

EXK EXNA EXBIC ALDO PK GFR

as: graph graph text graph graph text

Experiment Controls

Change Variable	Enter New Value	Info on Variable
DIETK <input type="text"/>	60 <input type="text"/>	60 mEq/Day <input type="text"/>
Choose <input type="text"/>	<input type="text"/>	<input type="text"/>

Run Experiment:
for 24h minutes at 1h minute intervals.

Help

Help info on: DIETK

Tips: Control Dietary Intake

View

Variable Value: Choose

Patient Charts or Lab tests:
Choose One

Graph Style Size: 600

Normalized, one graph

Characterize how well the kidney is handles normal K⁺ intake loads (EXK, PK). Account for the values of EXNA and ALDO. What percentage of the mass flow into the nephrons of K (GFR*PK) is being eliminated? How much is therefore being secreted? Optional- Redo the experiment to account for %-age of Na⁺ load eliminated Note: you could extend this experiment to > 24 hour period to evaluate the effectiveness of the longer term response. Also note that EXBIC can be used as an indicator of H⁺ excretion/retention provided PCO₂ remains fairly constant. A decrease indicates MORE acid is being excreted.