

Renal Vignettes – acid base balance

Reduced Extra Cellular Fluid Volume (ECFV) Induces Alkalosis

HUMAN vignettes are brief, highly targeted exercises aimed at reinforcing single basic physiological points. A fuller more open ended exercise in acid-base balance can be found in the Acid-Base Balance exercise link on this same page.

Renal cell ion counter and co-transport pumps usually perform multiple functions. Below you investigate the effect of lowering ECFV and its consequent Na pump reabsorption upregulation on a acid-base balance. ECF volume is reduced isototically via hemorrhage.

a) Set tables under View Output: for acid-base and renal output monitoring

PH, PCO2A, BICARB, UPH, EXNA, ECFV (note: look each of these up in Help info on:)
In Patient Charts .. on *each* run ask for a Kidney Summary.

Now execute a baseline run running for 60 min. w/ 60 min. between printouts.

b) Deplete ECFV via hemorrhage of 1000 ml. in 60 min. (note: look up HEMVOL & HEMMIN in Help info on:)

1) Continue the experiment for 6 days (d) at 6 hour (h) intervals. (change 3d to 6d below)

What acid-base effect has the hemorrhage had? Use the values for Na excretion, urine pH and blood pH to explain the likely pump mechanism responsible.

Change Variable	Enter New Value	Info on Variable
HEMVOL	1000	ml
HEMMIN	60	Minutes

Run Experiment:
for 3d minutes at 6h minute intervals.

Go Start Over

Help info on: UPH
Tips: Hemorrhage

View
Variable Value: Choose
Patient Charts or Lab tests: Choose One
Graph Style Size: 600
Normalized, one graph

Initial setup