

## A web-HUMAN Renal Physiology Experiment

**Renal Response to an Induced Metabolic Alkalosis**

We induce a metabolic alkalosis by infusing Na bicarbonate at 10 times its normal blood concentration and monitor the renal (& respiratory) compensatory responses.

Basic Procedure

Always turn off your popup blocker before working in web-HUMAN!

Setting up the experiment – Part 1

- 1) Set the variables to be monitored in **View Output:** as shown (below, top row)
- 2) Collect a Urine Specimen- In the **View** section set Patient Charts .. to Urine Specimen.
- 3) Begin to set up the bicarbonate infusion – In **Experiment Controls** section
  - Set the infusion time (IFMIN) to 60
  - Set the bicarbonate of the infusate to 240 (10 times normal blood HCO<sub>3</sub><sup>-</sup>)
  - We will turn the infusion on later. [ Try How do I?-> Infuse Electrolytes for more on infusing ].

The screenshot shows the web-HUMAN interface with the following sections:

- View Output:**
  - Variables: PH, PCO2A, BICARB, AVENT, UPH, EXNA (all set to 'text')
- Experiment Controls:**

Change Variable	Enter New Value	Info on Variable
IFMIN	60	Minutes
IFBIC	240	mMol/L

Run Experiment:  
for 0 minutes at 0 minute intervals.

Buttons: Go, Start Over
- Help:**

Help info on: Choose

Tips: How Do I?
- View:**

Variable Value: Choose

Patient Charts or Lab tests: Urine Specimen

Graph Style: Normalized, one graph

Size: 600

- 4) We will continue setting up the experiment on the next screen. To reach it, we run the experiment for zero time! Under Run Experiment:, we enter values as follows:
  - we run for 0 minutes
  - at 0 minute intervals between data read outs and then
  - Press the <Go> button to run.

Your **Output from Web-HUMAN** appears. Note that your Tables now have in them the variables you selected (e.g. pH), that the model now has your 2 new infusion settings (e.g. infusion time span is now set from 10 to 60 min.) and that a baseline set of URINE SPECIMEN values have been returned.

Also note that you have a new experimental navigator ready for your final settings before executing the experiment. We will now enter those final settings.

## Setting up the experiment – Part 2

- 1) Select the variables we wish to be *graphed* in the **View Output:** section (below, top row).
  - under each variable of interest (e.g. PH) select the as: graph option.
- 2) Collect another Urine Specimen for comparison with the first- In the **View** section set Patient Charts .. to Urine Specimen .

The screenshot shows a software interface for setting up an experiment. It is divided into three main sections: View Output, Experiment Controls, and View.

**View Output:** This section contains six dropdown menus for variables: PH, PCO2A, BICARB, AVENT, UPH, and EXNA. Below each variable is a dropdown menu labeled 'as:' with 'graph' selected for all.

**Experiment Controls:** This section contains a table for variable control and a 'Run Experiment' section.

Change Variable	Enter New Value	Info on Variable
IFVOL	1000	ml
Choose		

Run Experiment:  
for 50 minutes at 10 minute intervals.

Go Start Over

**View:** This section contains a 'Variable Value' dropdown (Choose), a 'Patient Charts or Lab tests:' dropdown (Urine Specimen), a 'Graph Style' dropdown (Normalized, one graph), and a 'Size' dropdown (600).

- 3) Complete the set up of the bicarbonate infusion – In **Experiment Controls** section
  - Set the infusion volume (IFVOL) to 1000 .
- 4) We are ready to infuse and run our experiment. To do so, Under Run Experiment:, we enter values as follows:
  - we run for 50 minutes
  - at 10 minute intervals between data read outs and then
  - Press the <Go> button to run.

Voila! You see a graphic and a tabular output of your results.

- 5) We will discuss the graphic and tabular results. Re: table numbers note Scientific notation in FORTRAN and HUMAN
- |            |             |     |
|------------|-------------|-----|
| scientific | -1.0*10-1 = | 0.1 |
| in HUMAN   | -1.0*E-01 = | 0.1 |