

From the "Student's Manual", HUMAN-80, "Microcomputer Version of A Mathematical Model of the Human Body in Health, Disease and During Treatment". Thomas G. Coleman and James E. Randal, April, 1981. Modified for use with web-HUMAN. Manual material is the property of Drs. Coleman & Randal and may be reproduced for educational purposes only.

EXPERIMENT 6. RENAL ARTERY STENOSIS

Inpaired renal perfusion initiates a complex humoral-hemodynamic response that produces hypertension. This can be simulated using a parameter called CLAMP which represents the pressure drop, in mm Hg, across a stenosis of the renal artery.

Select a clamp pressure drop of 40 mm Hg and follow the consequences for 2 weeks. It would be best to obtain reports once every two hours for the first day and once a day thereafter. Enter the values of the key variables in the following table.

TIME	AP	TPR	PRA	ECFL	EXH2O
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Control	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____
6	_____	_____	_____	_____	_____
8	_____	_____	_____	_____	_____
10	_____	_____	_____	_____	_____
12	_____	_____	_____	_____	_____
14	_____	_____	_____	_____	_____
16	_____	_____	_____	_____	_____
18	_____	_____	_____	_____	_____
20	_____	_____	_____	_____	_____
22	_____	_____	_____	_____	_____
Day 2	_____	_____	_____	_____	_____
Day 3	_____	_____	_____	_____	_____
Day 4	_____	_____	_____	_____	_____
Day 5	_____	_____	_____	_____	_____
Day 6	_____	_____	_____	_____	_____
Day 7	_____	_____	_____	_____	_____
Day 8	_____	_____	_____	_____	_____
Day 9	_____	_____	_____	_____	_____
Day 10	_____	_____	_____	_____	_____
Day 11	_____	_____	_____	_____	_____
Day 12	_____	_____	_____	_____	_____
Day 13	_____	_____	_____	_____	_____

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Explain the changes in sodium and water excretion, heart rate, fluid volumes, arterial pressure, cardiac output, total peripheral resistance, and hormone levels.

Extra: What happens to the pressure distal to the stenosis (RENPP)? What happens to the renal blood flow (RBF)? Is uremia an acute problem here? Acidosis? Which drugs are useful in lowering blood pressure in this instance?

Notes on the Use of HUMAN-80 Student Manual Experiments in *web*-HUMAN

Essentially all HUMAN-80 experiments run *perfectly* in *web*-HUMAN. Nevertheless, those using the HUMAN-80 experiments with the current *web*-HUMAN model should be aware of certain minor compatibility issues and limitations.

What is HUMAN-80?: There have been multiple past versions of the HUMAN model of which *web*-HUMAN and HUMAN-80 are but two. Human-80 was a version of the HUMAN model designed to run on desktop PC's. Although both versions of the model behave virtually identically *physiologically*, they obviously differ vastly in how the user interacts with them. This means that those parts of a HUMAN-80 experiment instruction sheet that are user-interface specific are not necessarily fully compatible with *web*-HUMAN.

Adapting HUMAN-80 Manual experiments to *web*-HUMAN:

Essentially all HUMAN-80 experiments run *perfectly* in *web*-HUMAN. Just follow Dr. Randall's instructions step by step.

- wherever possible the text of these exercises has been edited or annotated to increase compatibility of the instructions with *web*-HUMAN. Thus references to commands that differ between the two versions have been updated either by editing or by indication with a commented superscripted symbol (* or #) .

- experiment numbers in HUMAN-80 *DO NOT MATCH* those in those in *web*-HUMAN. To create your own tabular output format simply load *web*-HUMAN experiment #1 and follow Dr. Randall's instructions using **View output**: to create your own data tables.

- users should note that HUMAN-80 had no graphic output, only tables. In *web*-HUMAN you can choose to graph by simply selecting **<graph>** instead of just **<text>** below each variable in the **View output**: table.

- HUMAN-80 instructions sometimes ask for users to look at more than six variables. To do so simply rerun the experiment with the additional variables displayed or use the **<View Variable>** option to obtain a value for a variable that is not in the tables.