

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 #19. REDUCED HEART STRENGTH**

The consequences of reduced heart strength can be investigated by decreasing the left heart strength (LHSB) from a normal of 1.0 to lower values. The consequences of small reductions in heart strength will be much different than larger reductions, of course. Investigate reductions to strengths of 0.75, 0.50, and 0.25. The acute response will be much different than the chronic one. Follow each reduction for a period of 4 days.

	LHSB = .75		LHSB = .50		LHSB = 0.25	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
AP	_____	_____	_____	_____	_____	_____
CO	_____	_____	_____	_____	_____	_____
RAP	_____	_____	_____	_____	_____	_____
LAP	_____	_____	_____	_____	_____	_____
BV	_____	_____	_____	_____	_____	_____
SYMPNA	_____	_____	_____	_____	_____	_____
ECFV	_____	_____	_____	_____	_____	_____
BUN	_____	_____	_____	_____	_____	_____

With severe reductions in heart strength, there is often a fine line between eventual recovery and rapid deterioration. Reduce left heart strength to .3 x normal and then develop a strategy to keep the patient alive.

## 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.