## **EXPERIMENTS**

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 #12. COMPLETE SYMPATHETIC BLOCKADE

The role of the sympathetic nerves can be studied by blocking nerve traffic. Two parameters must be changed. the first is a switch (SYMSW) than changes sympathetic outflow from a physiological variable to a fixed value when SYMSW is changed from 0. to 1. The second parameter (SYMCL) defines the fixed or clamped level of nerve activity. A value of 1. is normal; 10. is maximum.

In this exercise we will set SYMSW to 1.0 than set SYMCL to 0.0 to simulate interruption of efferent flow. Compare the acute and longer-term responses. What mechanisms compensate for a decrease in sympathetic output. Note: Posture is controlled by the parameter UP. UP = 1. is upright; UP = -1. is prone.

		Acute		After 10 days	
Sympathetic Activity	SYMCL	1.0	0.0	0.0	
Arterial Pressure	AP			-	
Cardiac Output	CO	-			
Total Peripher. Resis.	TPR				
Heart Rate	PULSE				
Left Heart Strength	LHS	-			
Mean Cir.Fill.Press.	MCFP			-	
Blood Volume	BV				
Urine Flow	EXH20			-	

As an extension of this exercise, we can study the buffering role of the baroreceptors. Compare the hemodynamic responses to transfusion of 1 liter of blood when sympathetic function is intact and again when it is clamped at a value of 1.0.

	AP		COL		TPR	
	Control	Change	Control	Change	Control	Change
Normal						
Clamped						

## 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 <u>edited or annotated</u> 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 #).
- <u>experiment numbers</u> 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 <u>no graphic output</u>, 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 <u>more than six variables</u>. 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.