EXPERIMENT #3. TRANSFUSION

Blood volume expansion leads to increased cardiac output. We can simulate transfusion by specifying the volume of blood to be given (TRNVOL) in ml, the time over which the transfusion is given (TRNMIN) in minutes, and the hematocrit of the transfused blood (TRNHCT).

Study the effects of rapid administration of 1 liter of blood. What mechanisms are involved in the flow increase? Quantitate the contributions of heart strength, right atrial pressure, mean circulatory filling pressure, and total peripheral resistance.

		BEFORE	AFTER	% CHANGE
Blood volume	BV	_____	_____	_____
Cardiac output	CO	_____	_____	_____
Mean Circ. Filling Press	MCFP	_____	_____	_____
Right Atrial Pressure	RAP	_____	_____	_____
Right Heart Strength	RHS	_____	_____	_____
Left Atrial Pressure	LAP	_____	_____	_____
Left Heart Strength	LHS	_____	_____	_____
Pulse (beats/min)	PULSE	_____	_____	_____

Which factors tended to increase cardiac output? Which factors opposed the increase?

Extra: Study the renal response to transfusion and identify the factors leading to an increased salt and water excretion.

Extra: One hour after transfusion, what fraction of the added plasma volume is in the circulation? _____%. What fraction has been excreted? _____%. What fraction is in the interstitium? _____%. What fraction is in the cells? _____%.

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.