EXPERIMENT #15. CO_2 INHALATION

Inspired CO_2 concentration is usually zero but it is sometimes experimentally raised above zero to assess the responsiveness of the respiratory system. A gas mixture containing 5% CO_2 is typically used. We can simulate this by changing the fraction of inspired air that is CO_2 (FCO2AT) from 0. to 0.05. what is the time course and magnitude of the ventilatory changes: total ventilation (VENT), tidal volume (TIDVOL), and respiratory rate (RESPRT)?

	VENT	TIDVOL	RESPRT

After starting 5% CO_2:

	VENT	TIDVOL	RESPRT
0 min	___	___	___
10	___	___	___
20	___	___	___
30	___	___	___
40	___	___	___
50	___	___	___
60	___	___	___

Upon returning to 0% CO_2:

	VENT	TIDVOL	RESPRT
0 min	___	___	___
10	___	___	___
20	___	___	___
30	___	___	___
40	___	___	___
50	___	___	___
60	___	___	___

How did the blood gases change with 5% CO_2?

		0% CO_2	5% CO_2
Arterial PO_2	PO2A	_____	_____
Arterial PCO_2	PCO2A	_____	_____
Blood pH	PH	_____	_____

Explain how each of these changes may have inhibited or stimulated ventilation.

Identify the **importance** of compensations that normally occur by repeating this study **using** fixed ventilation and comparing these results to those obtained with the naturally occurring changes. fixed ventilation can be achieved using **artificial** respiration.

		Physiological Control	Artificial Control
Arterial PO_2	PO2A	_____	_____
Arterial PCO_2	PCO2A	_____	_____
Blood pH	PH	_____	_____

What are the significant differences?

What happened to the brain bloodflow in the previous situations?

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 underlined 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.