## Hypoventilation – PA02 calculations

Hypoventilation results in both abnormal PCO2 and PO2 values. As per the texts, the fall in PO2 resulting from lung hypoventilation may be calculated via the alveolar gas equation:

$$P_{A_{O_2}} = P_{I_{O_2}} - \frac{P_{A_{CO_2}}}{R} + F$$

where $P_{IO2}$ is the inspired PO2, $P_{AO2}$ is the measured alveolar PO2, $P_{ACO2}$ is the alveolar PCO2, R is the respiratory quotient & F is a negligible correction factor under most circumstances.

Case data retrieval

Case data is retrieved from experiments stored in the HUMAN data base. Log in for personalized features, select 'Get a saved experiment' and locate the folder RespPhysFall08 , open it and then, as/if directed to, open the indicated file.

Procedure

1) Run #1 – Determine by calculation (alveolar gas equation) the value of the alveolar gas partial pressures in HUMAN *at rest*.

2) Run #2 – Run the model "HypoVent Calc PA02 Case 1"

-hit <Go> to enter these respirator settings.

-turn on the respirator (ARTRES=1) and run for 5 hours with 15 min. between printouts.

- determine by calculation ($P_{AO2}$ -alveolar gas equation) and readout ($P_{ACO2}$) the value of the alveolar gas partial pressures at 5 hours.

3) Run #3 – Retrieve "HypoVent Calc PA02 Case "

-hit <Go> to enter these respirator settings.

-turn on the respirator (ARTRES=1) and run for 5 hours with 15 min. between printouts.

- determine by calculation (alveolar gas equation) the value of the alveolar gas partial pressures at 5 hours.

Present each experimental run, your calculations and any other relevant aspects of the case to the class.