

PRACTICE PROBLEMS:

KEY

Calculate the partial pressure of oxygen in a dry gas at a barometric pressure of 760 Torr and an F_{iO_2} of 60%?

$$\begin{aligned} PO_2 &= (760 \text{ torr} - 47 \text{ torr}) \times .60 \\ &= 427.8 \text{ torr} \end{aligned}$$

The patient is breathing room air. Calculate the partial pressure of CO_2 in a dry gas where the barometric pressure is 740 Torr?

$$\begin{aligned} PCO_2 &= 740 \text{ Torr} \times .0003 \\ &= 0.22 \text{ Torr} \end{aligned}$$

The patient is breathing room air. Calculate the partial pressure of N_2 in a dry gas at a barometric pressure of 650 mm Hg?

$$\begin{aligned} PN_2 &= 650 \text{ mm Hg} \times .78 \\ &= 507 \text{ mm Hg} \end{aligned}$$

The patient is breathing room air. The barometric pressure is 750 mm Hg. What is the partial pressure of oxygen after it enters the patient's lungs (saturated gas)? $PaCO_2$ 40 torr & RQ 0.8.

$$\begin{aligned} PAO_2 &= [(P_{\text{Baro}} - P_{H_2O}) \times .21] - (PaCO_2 / 0.8) \\ &= (703 \times .21) - (40/0.8) \\ &= 147.6 - 50 \\ &= 97.6 \text{ mmHg} \end{aligned}$$

QUESTION:

What is the F_{iO_2} on top of Pike's Peak at a barometric pressure of 550 mm Hg?

$$F_{iO_2} \text{ is } .21$$

. What is the F_{iO_2} in a deep, deep well at an atmospheric pressure of 620 mm Hg?

$$F_{iO_2} = .21 \quad \text{or} \quad 21\% O_2$$

What is the PO_2 if the PB is 734 Torr and the F_{iO_2} is 1.0 (100% O_2)

$$\begin{aligned} PO_2 &= (734 \text{ torr} - 47 \text{ torr}) \times 1 \\ &= 687 \text{ torr} \end{aligned}$$

PRACTICE PROBLEM:

A patient being treated for carbon monoxide poisoning is placed in a hyperbaric chamber. The pressure is increased to 3 ATM, the temperature is maintained constant at 37 C. (Note: This is occurring at Leadville Colorado, elevation 10,200 feet). The F_{iO_2} within the chamber is 1.0 or 100% O_2 . Which of the following statements is true?

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| I. The inspired oxygen tension (PO_2) is 760 mm Hg | A. I and IV |
| II. The inspired oxygen tension is 2280 mm Hg | B. I, III, IV |
| III. The altitude is not a factor | C. II and III |
| IV. The altitude and temperature are a factor | D. I, II, III |
| V. A hyperbaric chamber is contraindicated for this situation | E. V only |