

## 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?

- |   |                      |
|---|----------------------|
| 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                             | <b>C. II and III</b> |
| IV. The altitude and temperature are a factor                 | D. I, II, III        |
| V. A hyperbaric chamber is contraindicated for this situation | E. V only            |