1. \( V_A = (TV - DS) \times (750\text{ml} - 300\text{ml}) \times 10/\text{min} = 4500\text{ml/min} \)

\( FRC = \text{Total amount of gas in lungs at end of expiration} = 4.0 \)

\( TV = \text{Change in volume of all alveoli on one breath} = 0.75\text{L} \)

\( IV = 0.75 / 4.0 = 0.1907 \text{ change in alveoli with each breath} \)

2. % Saturation = 85.70%

\( EROD \text{ using O}_2 \text{ dissociation curve} \): \( P_{O_2} = 50\text{mm Hg} \)

In fetus, a lower \( P_{O_2} \) gives 85% saturation, since fetal \( Hb \) binds \( O_2 \) more tightly, ( i.e.; curve is to left )

3. \( \text{in solution}: (180\text{mm Hg}) \times 0.03 \text{mlO}_2/\text{L} \times \text{mm Hg} = 3 \text{ml O}_2/\text{L} \)

\( \text{on Hb}: (0.975)(1.39\text{mlO}_2/\text{g})(150\text{g/L}) \)

\( \quad \text{total} \quad = \frac{203}{20.16 \text{ml O}_2/\text{L}} \)

\( \text{in solution}: (670\text{mm Hg}) \times 0.03 \text{mlO}_2/\text{L} \times \text{mm Hg} = 20 \text{ml O}_2/\text{L} \)

\( \text{on Hb}: (0.99)(1.39\text{mlO}_2/\text{g})(150\text{g/L}) \)

\( \quad \text{estimated} \quad = \frac{106}{22.6 \text{ml O}_2/\text{L}} \)

\( \quad \text{total} \quad \)

\( \text{increase} = 22.6 - 20.6 = 2.0 \text{mlO}_2/\text{L} \)

4. Asthma:

- Airways narrowed;
- Normal \( P_{ACO_2} \)
- Indicates able to ventilate alveoli normally (although it's a struggle)

Effect of oxygen therapy similar to that in normal person.

Contusion:

- Major portion of lung not ventilated - i.e.; big "shunt"
- \( PacO_2 \) near normal indicates hyperventilation of good lung able to blow off normal amount \( CO_2 \)