

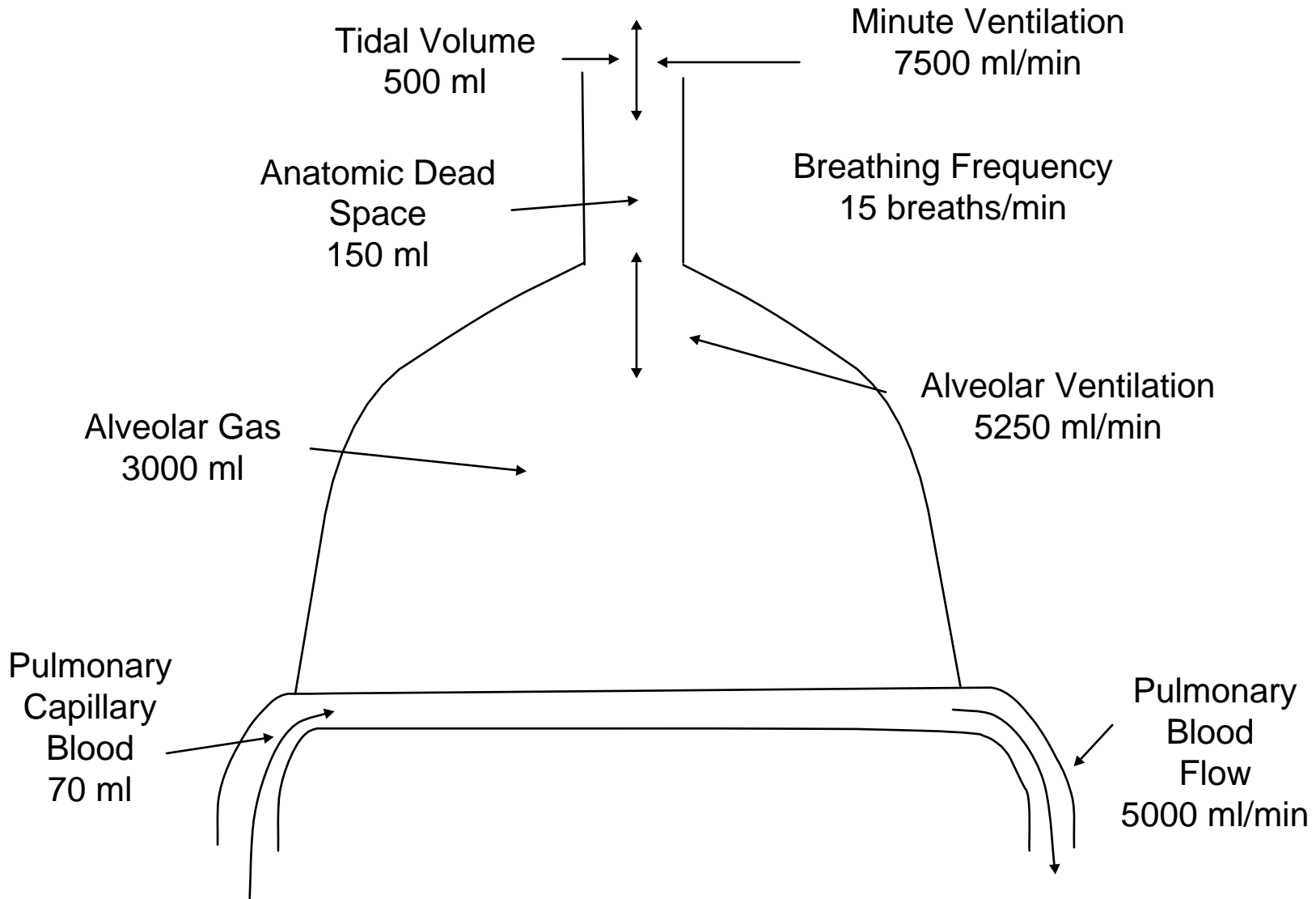
Ventilation

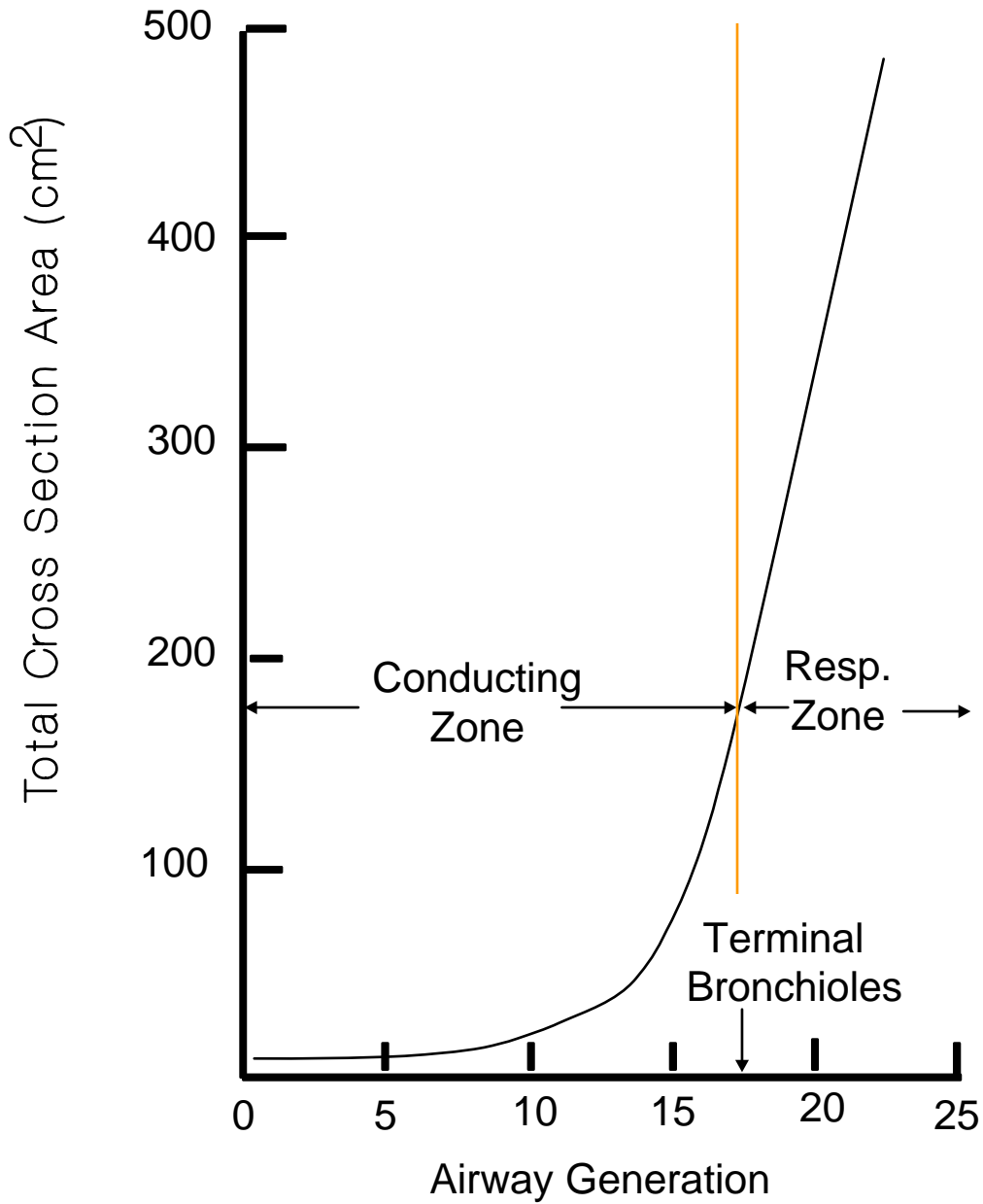
Breathing Patterns

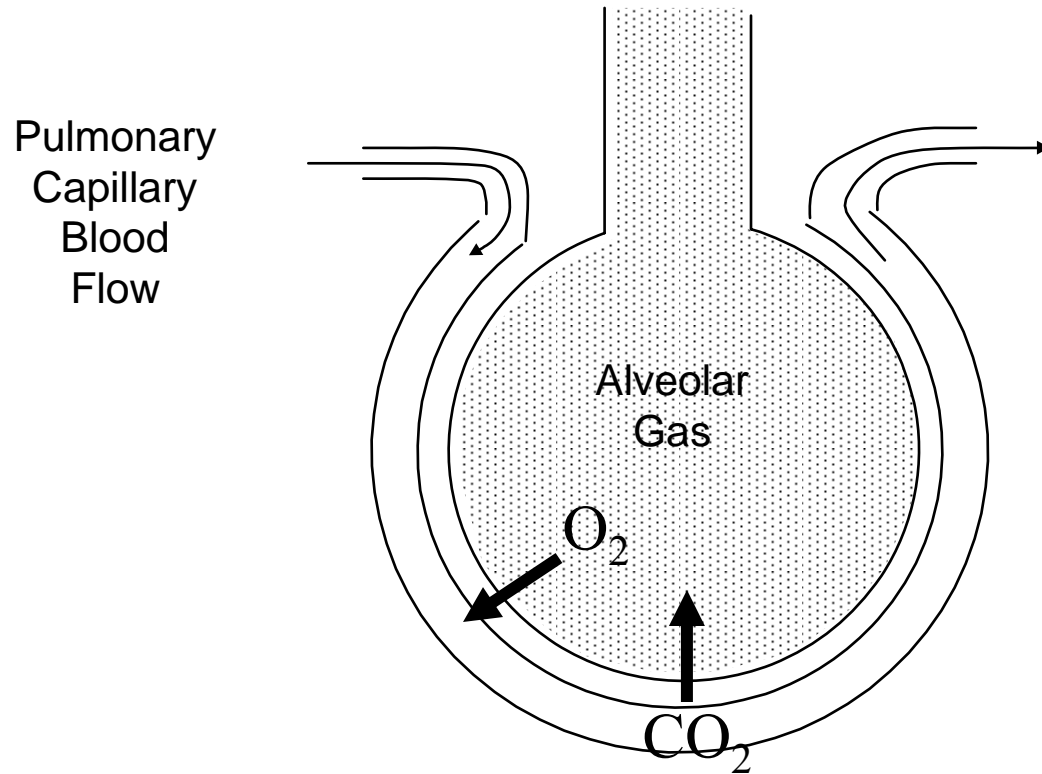
Work of Breathing

# VOLUMES

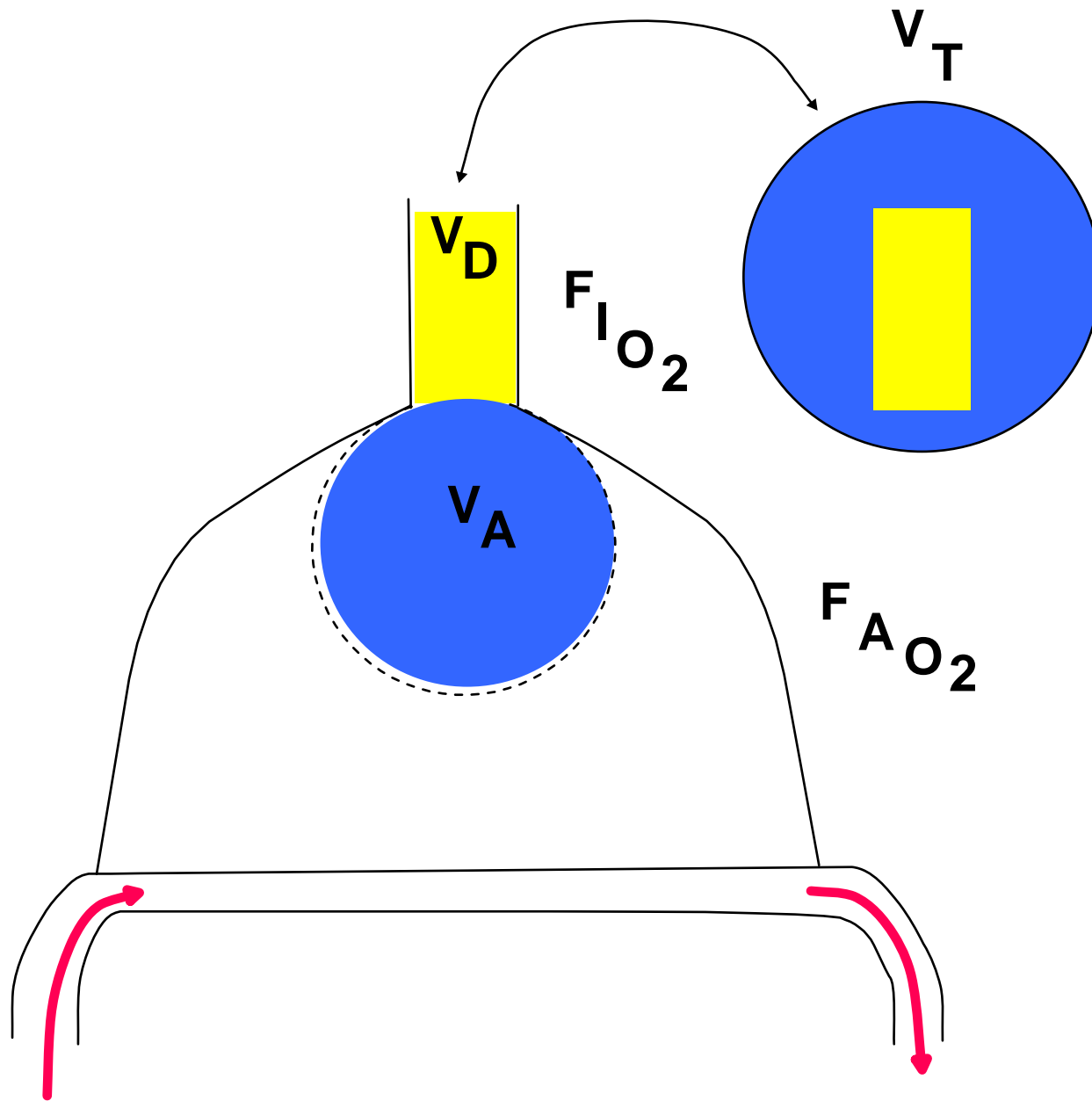
# FLOWS







Rate of Oxygen Absorption into the blood =  $\dot{V}_{O_2}$   
 Rate of Carbon Dioxide release into the alveoli =  $\dot{V}_{CO_2}$



## Minute Ventilation

$$\dot{V}_E = V_T * f$$

## Alveolar Ventilation

$$\dot{V}_A = (V_T - V_D) * f$$

# Alveolar Gas Equation

Setting the CO<sub>2</sub> Concentration Gradient:

$$P_{ACO_2} \approx P_{aCO_2} \quad \dot{V}_{CO_2} \quad \dot{V}_A$$

$$P_{ACO_2} = \left( \frac{\dot{V}_{CO_2}}{\dot{V}_A} \right) k$$

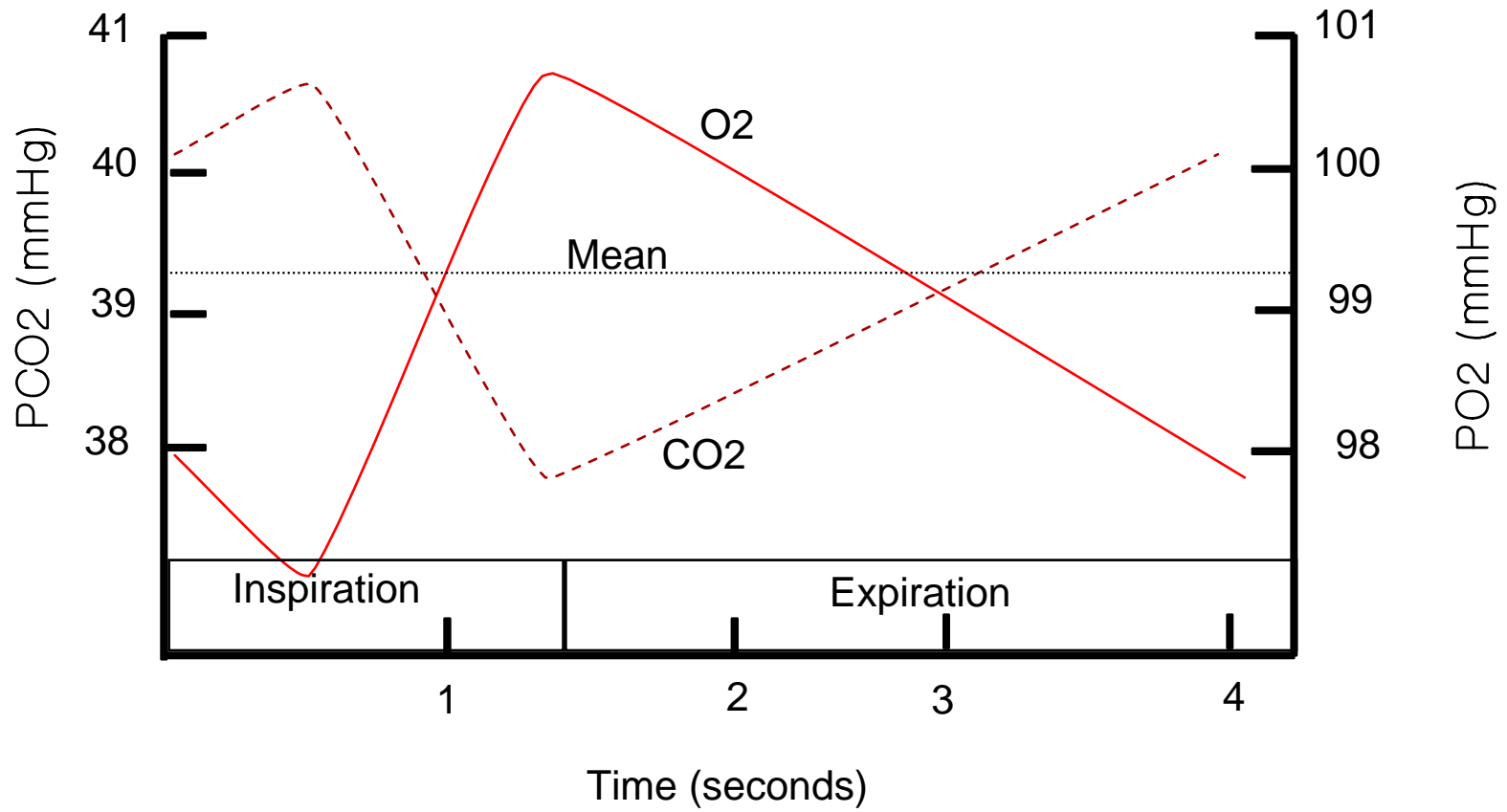
# Alveolar Gas Equation

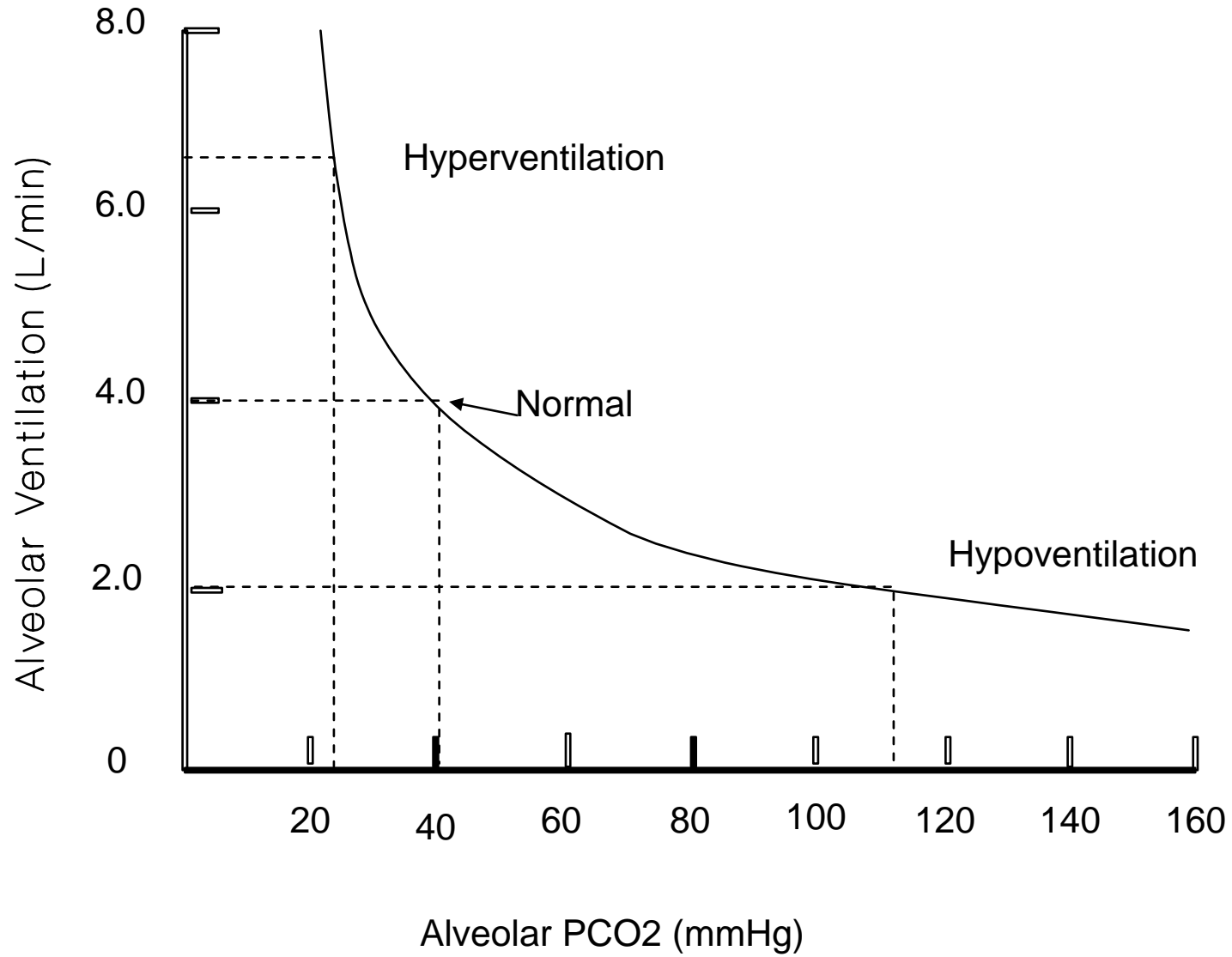
Setting the O<sub>2</sub> Concentration Gradient:

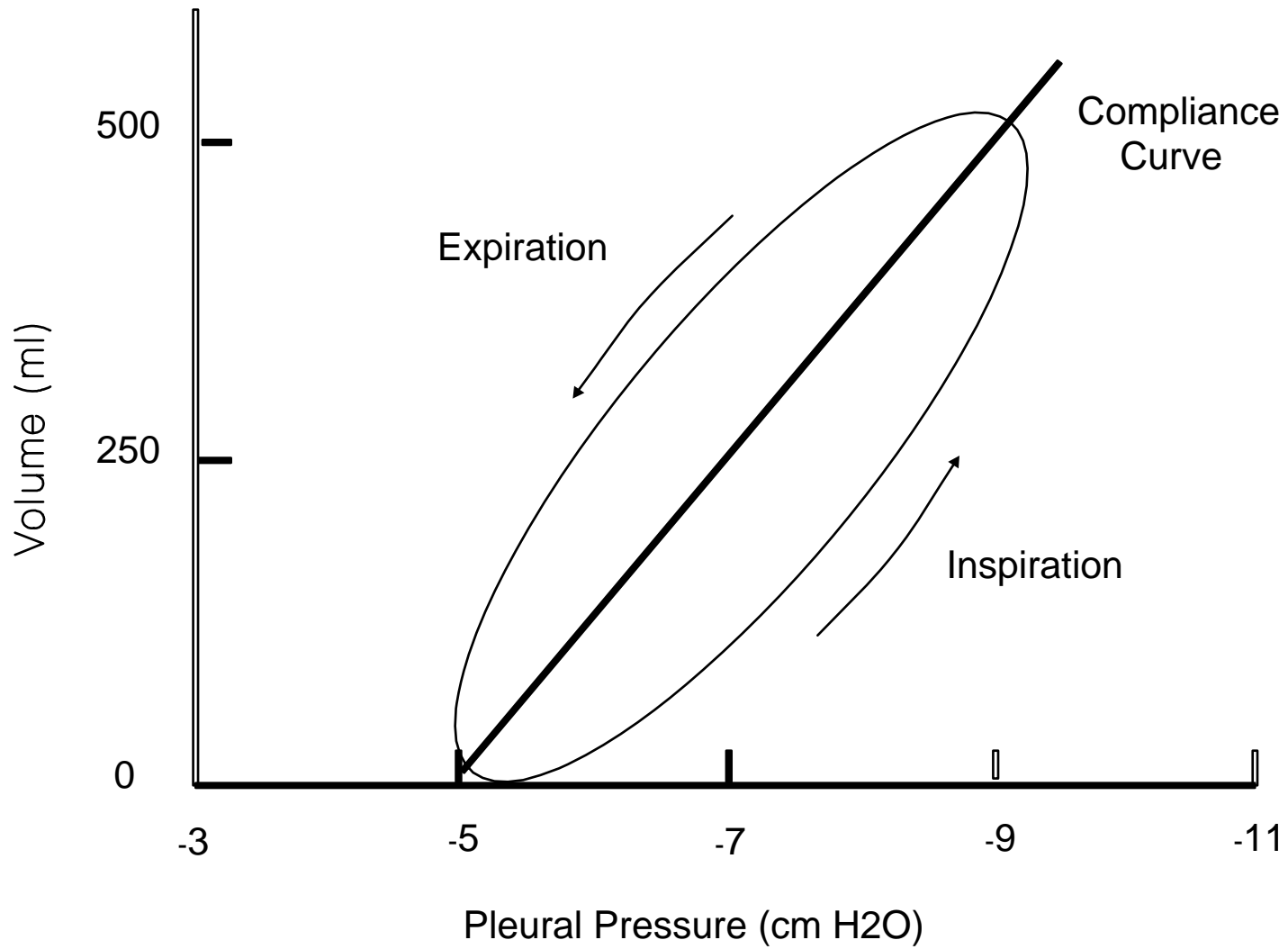
$$P_{AO_2} \approx P_{aO_2} - \frac{\dot{V}_{O_2}}{\dot{V}_A} P_{IO_2}$$

$$P_{AO_2} = P_{IO_2} - \left[ \left( \frac{\dot{V}_{O_2}}{\dot{V}_A} \right) k \right]$$

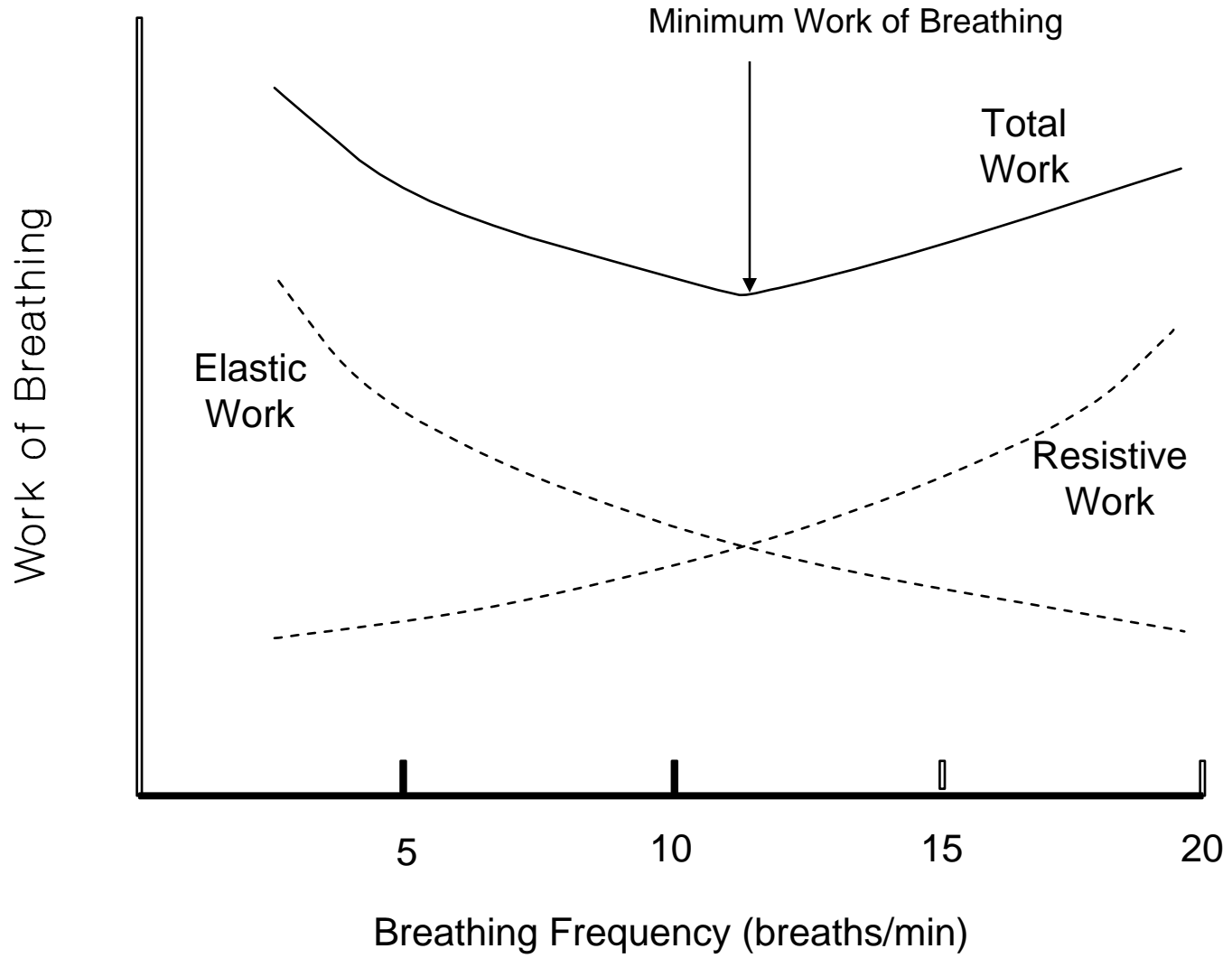








Work of Breathing:  $W = \int P \, dV$



# Breathing Strategies

1. Horse at rest breathes around FRC
2. Exercising quadruped gait limited, uses 1:1 gait-to-f
3. Neonate active FRC