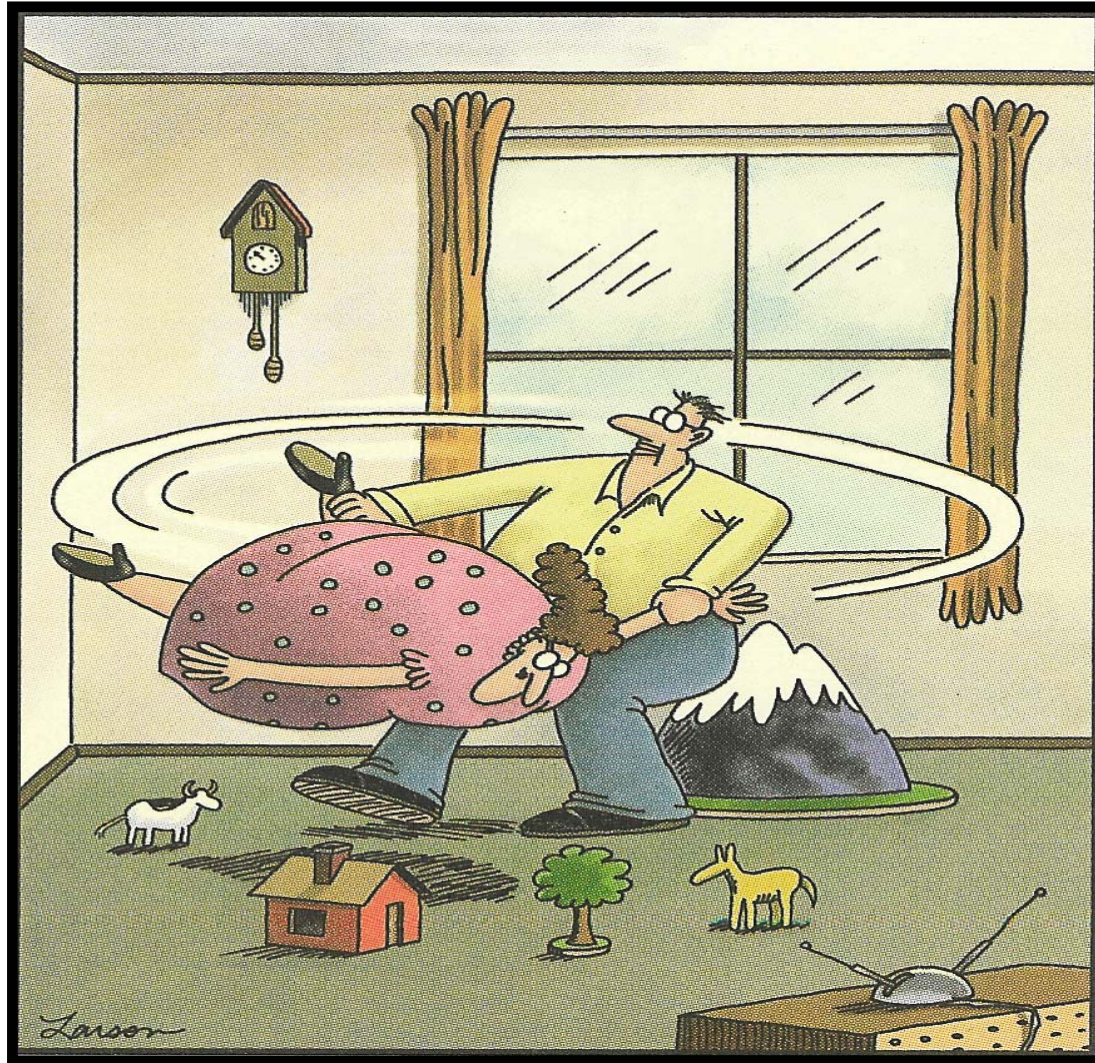


# Review of Causes of Hypoxia

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- **Additional causes of hypoxia**
  - **Decrease diffusion Capacity ( $DL_{CO}$ )**
    - **↓ Surface area for diffusion**
  - **Carbon monoxide poisoning**
  - **Right to left EXTRApulmonary shunt**
  - **Altitude exposure**



**On the next pass, however, Helen failed to clear the mountains.**

# US Navy Hypoxia Familiarization Training Program

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**F-18 Cruising Altitude  $\approx$  25,000 feet**

**Sea Level Oxygen Equivalent = 7%**

**Requires Supplemental oxygen and  
Cabin Pressurization**

**Hypoxia Familiarization Training:**

**Exposure to 25,000 feet for 4 min.**

**Equivalent to breathing 7% Oxygen  
at sea level**

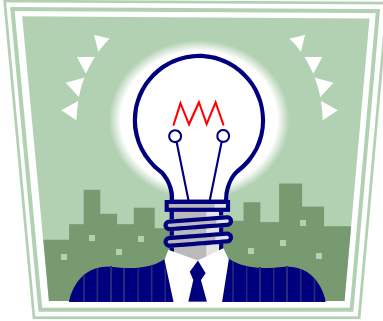


# Potential Risk of Altitude Exposure

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- **Barotrauma**
- **Decompression Sickness (DCS)**





# The Big Idea

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**Induce hypoxia by changing the composition of the inhaled gas mixture .....**

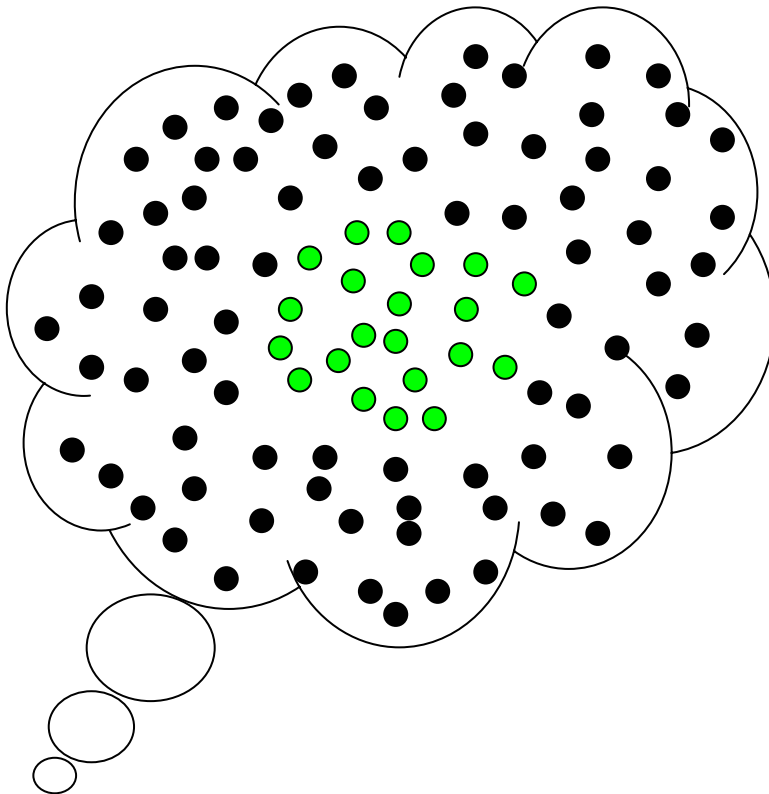
**..... as opposed to lowering the total pressure of the atmosphere**

$$PAO_2 = FiO_2 (Pb - PH_2O) - [PACO_2 / RQ]$$

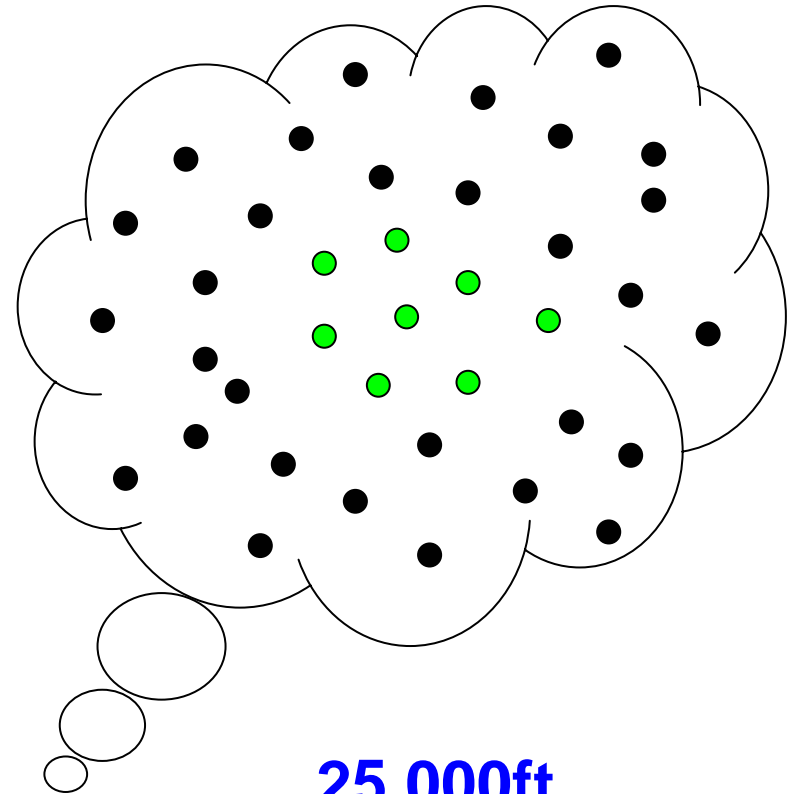
# Altitude Effects on O<sub>2</sub> Driving Pressure

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Sea Level  
21% O<sub>2</sub>  
160 mmHg



↑Alt.



25,000ft  
21% O<sub>2</sub>  
60 mmHg

# Nitrogen Dilution Effects on O<sub>2</sub> Driving Pressure

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Sea Level  
21% O<sub>2</sub>  
160 mmHg

Sea Level  
7% O<sub>2</sub>  
60 mmHg

