Aviation Physiology

- Hypoxia
  - Occurs when there is a deficiency of oxygen in the body
  - Symptoms

Headache	Decreased reaction time	Impaired judgement
Euphoria	Visual impairment	Drowsiness
Lightheaded / Dizzy	Numbness	Tingling in fingers / toes
Cyanosis (turning blue)	Limp muscles	

Aviation Physiology

- Hypoxic Hypoxia
  - Decrease of O^2 as a result of insufficient pressure
  - Altitude induced – extremely lethal
    - High Altitude rapidly or lower altitude over long time
  - Time of Useful Consciousness – Max time you have to make a decision & ACT
    - The following chart is a *guideline*! Your results may vary based on your personal physiology.

Aviation Physiology

Altitude	Time of Useful Consciousness
40,000	15-20 seconds
30,000	1-2 minutes
25,000	3-5 minutes
18,000	20-30 minutes
15,000	30-40 minutes
8,000	Normal
Sea Level	Normal

Aviation Physiology

- Hypemic Hypoxia
  - When the blood can't carry sufficient O^2 as a result of a deficiency in the blood
  - Carbon Monoxide poisoning is the most common form
    - CO in the blood displaces O^2 causing the deficiency
    - Smoking puts CO in the blood
  - If you suspect CO poisoning, open the windows & vents and turn off heater & defrost – Land ASAP

Aviation Physiology

- Stagnant Hypoxia
  - O^2 deficiency in the body due to poor circulation
  - Can be caused by shock, heart failing to pump effectively, or a constricted artery
  - More common is pulling G's, the blood pools in the lower extremities and may lead to grey or black outs
- Histotoxic Hypoxia
  - The inability of the cells to effectively use O^2
  - There may be enough O^2 reaching the cells, but the cell is unable to accept it
  - Caused by alcohol & other drugs such as narcotics & poisons

Aviation Physiology

- Prevention of Hypoxia
  - Maintain good physical conditioning, nutritious diet, avoid alcohol & smoking
  - Use supplemental O^2
  - You may not realize the onset of hypoxia, so prevention is key
- Supplemental O^2 FAR 91.211(a)
  - 12.5 – 14K --- Flight crew after 30 min
  - 14 – 15k --- Flight crew all the time
  - Above 15k --- Each occupant must be provided

Aviation Physiology

- Supplemental O^2
  - 3 Types of O^2 regulators & masks
    - Continuous Flow – provide 100% O^2 at a rate controlled by a valve
    - Demand – Provides O^2 only when inhaling
    - Pressure Demand – Provides positive pressure at all times
  - Aviation O^2 only, no medical O^2 (by regulation)
  - Consider supplemental when flying above 10k during the day, and above 5k at night
  - Better still – Use an oximeter to monitor O^2 concentration

Aviation Physiology

- Questions?

- Comments?