

Hypoxia Information Sheet For Aviation Personnel



IN-FLIGHT INCAPACITATION

HYPOXIA

- Hypoxia is a condition of insufficient oxygen to keep the brain and other body tissues functioning properly. It is slowly progressive and typically becomes noticeable at altitudes above 10,000 ft (3,300 m).



- The brain has no built-in alarm system to let you know when you are not getting enough oxygen. This is the reason why early detection of hypoxia signs and symptoms is important for aviation personnel.

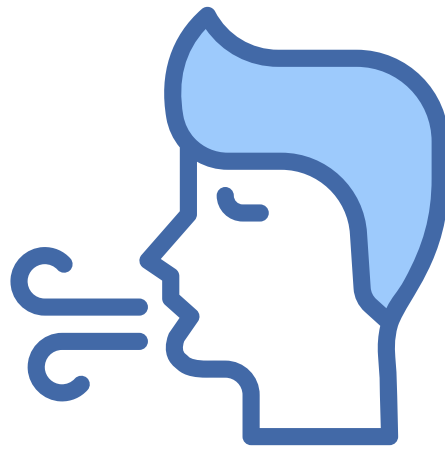


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COMMON SIGNS AND SYMPTOMS FOR HYPOXIA



BREATHLESSNESS



HYPERVENTILATION



HEADACHE



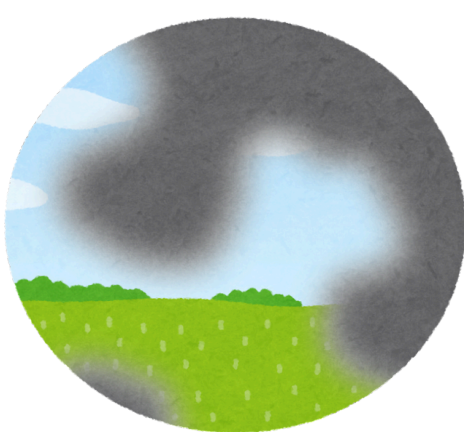
NAUSEA



TREMOR



PALLOR / CYANOSIS



BLURRING / DOUBLE VISION



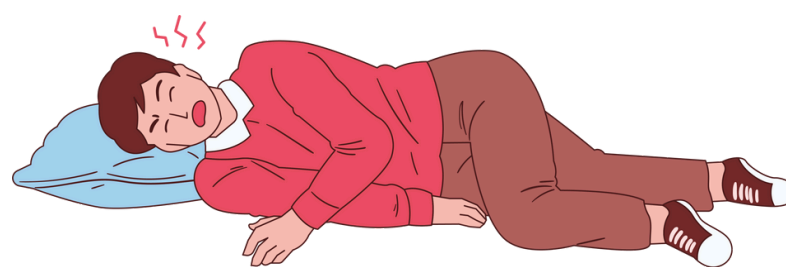
CONFUSION



ABNORMAL HEART RATE



SLURRED SPEECH



CONVULSION



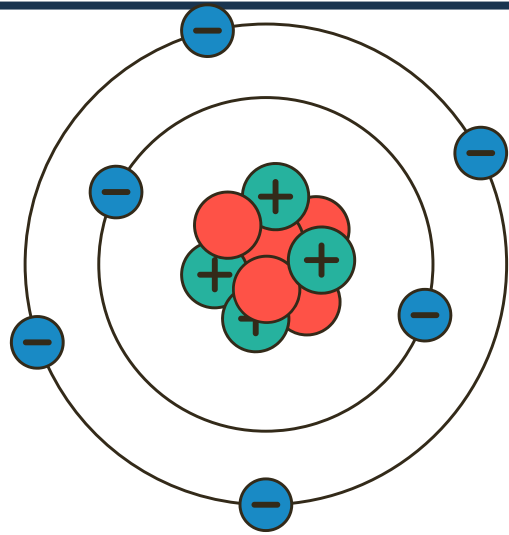
FAINTNESS

Health Promotion

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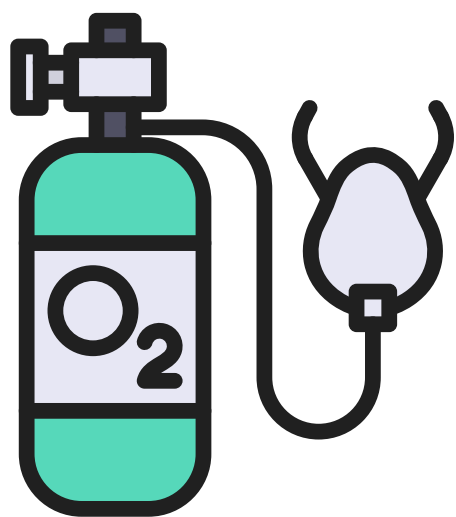
For Aviation Personnel

DETERMINANTS OF HYPOXIA



Oxygen concentration
(FiO_2)

- Oxygen concentration (FiO_2) is the amount or proportion of oxygen present in a given substance or environment. In the atmosphere, it remains constant at approximately 21% from sea level up to very high altitudes.

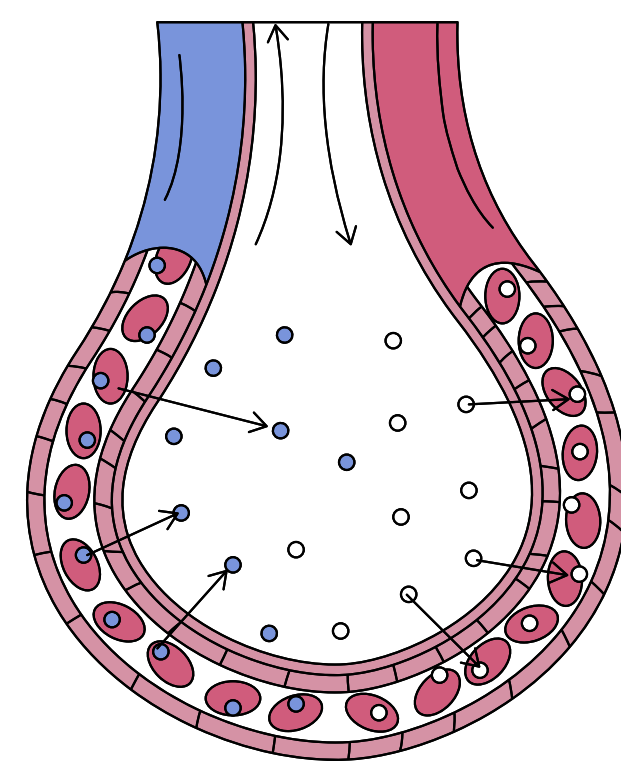


Oxygen Partial Pressure
(PaO_2)

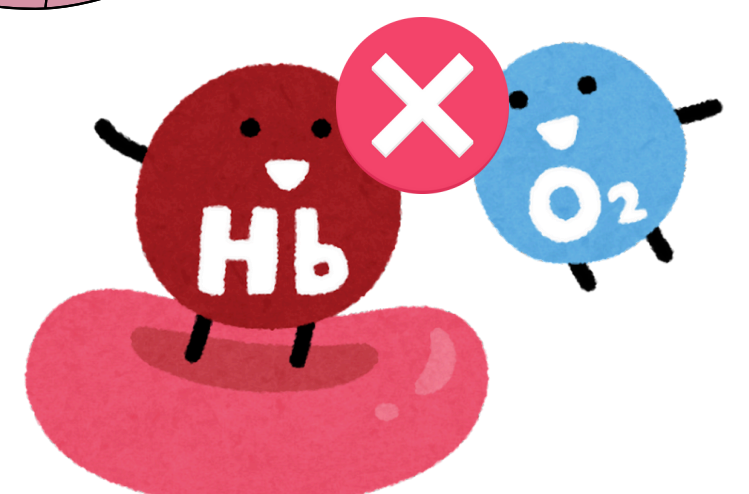
- Oxygen partial pressure (PaO_2) is the portion of the total atmospheric pressure exerted by oxygen which decreases significantly with altitude because total atmospheric pressure falls as elevation increases.
- **The body's oxygen uptake depends on PaO_2 , not FiO_2 .**

AVIATION PHYSIOLOGY RELATED TO HYPOXIA

- 1 Flying at high altitudes is linked to the total atmospheric pressure decreases.
- 2 As a result, the PaO_2 in the lungs decreases significantly. This lower pressure gradient makes it difficult for the body to transfer oxygen from the alveoli in the lungs into the bloodstream.
- 3 The body's ability to "load" oxygen onto hemoglobin is impaired, leading to a reduced oxygen saturation in the arterial blood. This leads to a lack of sufficient oxygen reaching the body's tissues.



Alveolus
Gas Exchange



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WHY AIRCRAFT PRESSURIZATION SYSTEM IS IMPORTANT?

The aircraft pressurization system is a system that maintains the air pressure inside the aircraft at a level that is constant and safe for human breathing. It is typically equivalent to an altitude of 6,000-8,000 feet, which allows the human body to function normally even when the aircraft is flying at altitudes with low external air pressure.



HYPOXIA PREVENTIVE MEASURES

PREVENTIVE MAINTENANCE

Maintaining normal operation of the pressurization system through preventive maintenance: aircraft must undergo strict scheduled maintenance on their pressurization systems to ensure the system can operate efficiently.

CONTINUOUS MONITORING

Pilots continuously monitor the pressure gauges, especially when the aircraft is ascending or descending.

CREW TRAINING

Flight crews should be trained to recognize the symptoms of hypoxia in themselves and others. Additionally, they should also be trained in the proper use of emergency oxygen equipment and procedures for handling a rapid decompression event.

