

Escaping Heat, Flying High...and the Flight Physiology you need to Know



The heat of the Arizona summer is now upon us. Fortunately, we have aircraft that can be one's "magic carpet ride" to cooler air and climates that are more enjoyable. Just the establishment of enroute cruise at 12,000'+ can give us cabin temperatures in the 60s-70s. But, this is now without risks if you fail to know the signs and symptoms of Hypoxia and how to react. The insidious effects of hypoxia can even occur at lower altitudes if there are some underlying health issues that you may or may not know about.

Hypoxia simply put is a lack of oxygen delivered to your brain. As you fly higher, the partial pressure of oxygen is lowered, thus less oxygen molecules that can be attached to the hemoglobin in your blood that will be delivered to your highly metabolic brain cells. However, there are other causes of hypoxia that can lower the altitude threshold that symptoms can occur. Carbon Monoxide from exhaust leaks will bind to the hemoglobin molecules stronger than oxygen. Toxins/drugs can reduce the blood's ability to carry oxygen. Underlying vascular issues can

reduce the oxygen delivery to the brain. Even “pulling G’s” will reduce cerebral blood flow and impair the brain’s ability to function and affect judgment.

The signs and symptoms of hypoxia are variable between individuals. One can become unable to solve simple problems, vision can be affected. Some folks get giddy, some sleepy. Others may develop a headache. Your excellent pilot judgment will be negatively impacted. If one flies high enough for long enough, the end result is loss of useful consciousness.

The scope of this short article is not to train you for hypoxia recognition, but to motivate you to get extra education and training in hypoxia and high altitude flight. The best way is with a High Altitude course. One is available at the ASU Polytechnic Campus at Williams Gateway Airport. Although there is a fee, this is an experience all aviators should have. Training sessions and chamber flight profiles can be tailored to fit your needs. For more information, call (480) 727-1254 or e-mail nathaniel.daggs@asu.edu.

Other issues to consider for flight at altitudes above 10,000’ are trapped gas. Gas (air) can be trapped in ears, facial sinus, teeth and areas of the gut. Usually, going up is not an issue; it is the descent that will bring on the discomfort. Learn how to perform a valsalva maneuver to relieve the trapped gasses in the head. But it is best to avoid the potential for this by not flying with sinus issues. As far as the gut, avoid carbonated beverages, gas producing foods on the day of flight. Your companions in the cockpit will thank you!

Know that at altitudes above 10,000’, the atmosphere that blocks harmful UV radiation is all but gone. For this reason, wear a good sun blocker on your skin and good UV protection sunglasses. Sunburn and retinal burns are not a laughing matter. Mountain climbers do this, you are in their territory.

For you flights above 10,000', I would strongly suggest you invest in an oxygen system. There are several portable systems that use oxygen saving nasal cannulas. Although there is a cash outlay up front, the increase in your mission capability will be worth it. Your aircraft can fly up in the mid-teens, why not take advantage of this capability and get in the cool, smooth air and hopefully get in a good tailwind and make some fast tracks out of Arizona. Most importantly, learn about high altitude physiology and learn how to best use and maintain your oxygen system.

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