

## Carbon Monoxide Poisoning

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The FAA has described the case of a pilot who was working through his routine pre-landing checklist. One problem, he had crash landed half an hour earlier and did not realize it. The pilot was a victim of carbon monoxide poisoning and thought he was still flying. Carbon monoxide is the most common toxic substance in the aviation environment.

Carbon monoxide is an odorless gas produced from incomplete fuel combustion. It has an affinity for hemoglobin, which in our blood transfers oxygen to our tissues, 200 times greater than oxygen itself. The result is a lack of oxygen delivered to vital organs. Importantly, most pulse oximeters, including those in smart watches can not differentiate between carboxyhemoglobin and oxyhemoglobin, so measured oxygen saturation appears normal.

Symptoms of carbon monoxide poisoning most often begin with headache, worsening with increasing blood level. Drowsiness, impaired judgement, blurred vision, and confusion can develop, with eventual unconsciousness and death if exposure persists. Early symptoms may be confused with fatigue, altitude hypoxia, or airsickness. If several people come down with similar symptoms, that may help point to carbon monoxide as the cause. At home, pets may be the first to show symptoms. Individuals with heart disease, respiratory problems, at higher altitude, or smokers are at increased risk with carbon monoxide exposure.

Prevention:

- Avoid any flames in enclosed areas, exhaust in garages or tents.
- Maintain all exhausts (recognize that damage to a plane's exhaust in summer may not manifest itself until the plane's heater is used in winter).
- Carbon Monoxide alarms (not all smoke alarms also respond to carbon monoxide).
- Be sure to monitor passive indicators in planes that do not have active alarms.

If symptoms of carbon monoxide poisoning occur in flight, the priority is to increase cabin ventilation and land as soon as possible. Pilots should not hesitate to declare an emergency. Cabin heat must be turned off. If an observation window can be safely opened, that will help with ventilation. If supplemental oxygen is available, that will improve oxygenation. On the ground, seek medical attention. Eventually, after removal from the underlying cause and exposure to fresh air, carbon monoxide will be washed out of the system. In most cases, symptoms resolve within a day.