



Federal Aviation  
Administration

# FATIGUE IN AVIATION



**F**atigue is an expected and ubiquitous aspect of life. For the average individual, fatigue presents a minor inconvenience, resolved with a nap or by stopping whatever activity that brought it on. Typically, there are no significant consequences. However, if that person is involved in safety-related activities such as operating a motor vehicle, piloting an aircraft, performing surgery, or running a nuclear reactor, the consequences of fatigue can be disastrous.

**Definition.** Defining fatigue in humans is extremely difficult due to the large variability of causes. Causes of fatigue can range from boredom to circadian rhythm disruption to heavy physical exertion. In lay terms, fatigue can simply be defined as weariness. However, from an operational standpoint a more accurate definition might be: “Fatigue is a condition characterized by increased discomfort with lessened capacity for work, reduced efficiency of accomplishment, loss of power or capacity to respond to stimulation, and is usually accompanied by a feeling of weariness and tiredness.”

## **Two key concepts can be derived from this second definition.**

1. Fatigue can develop from a variety of sources. The important factor is not what causes the fatigue but rather the negative impact fatigue has on a person’s ability to perform tasks. A long day of mental stimulation such as studying for an examination or processing data for a report can be as fatiguing as manual labor. They may feel different—a sore body instead of a headache and bleary eyes—but the end effect is the same, an inability to function normally.
2. Fatigue leads to a decrease in your ability to carry out tasks. Several studies have demonstrated significant impairment in a person’s ability to carry out tasks that require manual dexterity, concentration, and higher-order intellectual processing. Fatigue may happen acutely, which is to say in a relatively short time (hours) after some significant physical or mental activity. Or, it may occur gradually over several days or weeks. Typically, this situation occurs with someone who does not get sufficient sleep over a prolonged period of time (as with sleep apnea, jet lag, or shift work) or someone who is involved in ongoing physical or mental activity with insufficient rest.



**Stressors.** General aviation pilots are typically not exposed to the same occupational stresses as commercial pilots (i.e., long duty days, circadian disruptions from night flying or time zone changes, or scheduling changes). Nevertheless, they will still develop fatigue from a variety of other causes. Given the single-pilot operation and relatively higher workload, they would be just as much at risk (possibly even more) to be involved in an accident than a commercial crew. Any fatigued person will exhibit the same problems: sleepiness, difficulty concentrating, apathy, feeling of isolation, annoyance, increased reaction time to stimulus, slowing of higher-level mental functioning, decreased vigilance, memory problems, task fixation, and increased errors while performing tasks.

None of these are good things to have happen to a pilot, much less if there is no one else in the aircraft to help out.

In a variety of studies, fatigued individuals consistently underreported how tired they really were, as measured by physiologic parameters. A tired individual truly does not realize the extent of actual impairment. No degree of experience, motivation, medication, coffee, or will power can overcome fatigue.

**Antidote to Fatigue.** Obtaining adequate sleep is the best way to prevent or resolve fatigue. Sleep provides the body with a period of rest and recuperation. Insufficient sleep will result in significant physical and psychological problems. On average, a healthy adult does best with eight hours of uninterrupted sleep, but significant personal variations occur. For example, increasing sleep difficulties occur as we age, with significant shortening of nighttime sleep. A variety of medical conditions can influence the quality and duration of sleep. To name a few: sleep apnea, restless leg syndrome, certain medications, depression, stress, insomnia, and chronic pain. Some of the more common social or behavioral issues are: late-night activities, excessive alcohol or caffeine use, travel, interpersonal strife, uncomfortable or unfamiliar surroundings, and shift work.

**Prevention.** No one is immune from fatigue. Yet, in our society, establishing widespread preventive measures to combat fatigue is often a very difficult goal to achieve. Individuals, as well as organizations, often ignore the problem until an accident occurs. Even then, implementing lasting change is not guaranteed. Lifestyle changes are not easy for individuals, particularly if that person isn't in complete control of the condition. For example, commercial pilots must contend with shift work and circadian rhythm disruption. Often, they also choose to commute long distances to work, so that by the time a work cycle starts they have already traveled for several hours. While a general aviation pilot may not have to deal with this, a busy lifestyle or other issues may lead to fatigue. Therefore, general aviation pilots must make every effort to modify personal lifestyle factors that cause fatigue.

# Lifestyle Recommendations

## Don't...

- Consume alcohol or caffeine 3-4 hours before going to bed.
- Eat a heavy meal just before bedtime.
- Take work to bed.
- Exercise 2-3 hours before bedtime. While working out promotes a healthy lifestyle, it shouldn't be done too close to bedtime.
- Use sleeping pills (prescription or otherwise).

## Do...

- Be mindful of the side effects of certain medications, even over-the-counter medications – drowsiness or impaired alertness is a concern.
- Consult a physician to diagnose and treat any medical conditions causing sleep problems.
- Create a comfortable sleep environment at home. Adjust heating and cooling as needed. Get a comfortable mattress.
- When traveling, select hotels that provide a comfortable environment.
- Get into the habit of sleeping eight hours per night. When needed, and if possible, nap during the day, but limit the nap to less than 30 minutes. Longer naps produce sleep inertia, which is counterproductive.
- Try to turn in at the same time each day. This establishes a routine and helps you fall asleep quicker.
- If you can't fall asleep within 30 minutes of going to bed, get up and try an activity that helps induce sleep (watch non-violent TV, read, listen to relaxing music, etc).
- Get plenty of rest and minimize stress before a flight. If problems preclude a good night's sleep, rethink the flight and postpone it accordingly.

# MEDICAL FACTS FOR PILOTS

Publication #OK-07-193

Written by:

G.J. Salazar, MD

Prepared by

FAA Civil Aerospace Medical Institute

AAM-400, P.O. Box 25082

Oklahoma City, OK 73125

To request copies of this brochure, write to the above address or call (405) 954-4831.

For more pilot and traveler safety information, visit the FAA Web site—

[www.faa.gov/pilots/safety/pilotsafetybrochures](http://www.faa.gov/pilots/safety/pilotsafetybrochures)

[www.faa.gov/pilots/training/airman\\_education/aerospace\\_  
physiology/index.cfm](http://www.faa.gov/pilots/training/airman_education/aerospace_physiology/index.cfm)

[www.faa.gov/safety/programs\\_initiatives/health/  
physiologyvideos](http://www.faa.gov/safety/programs_initiatives/health/physiologyvideos)

[www.faa.gov/pilots/amelocator](http://www.faa.gov/pilots/amelocator)