

ASLEEP AT THE THROTTLE



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Fatigue impairs alertness and performance, often without your awareness. In fact, sleepiness/fatigue produces performance problems similar to those caused by alcohol. Fatigue is a significant risk factor in all aspects of aviation.

What is fatigue?

Fatigue and sleepiness are often considered to be the same. It is the state of tiredness due to prolonged work or insufficient sleep. Its' effects are underestimated because there is no "Breathalyser™" for fatigue, and sleepy pilots are reluctant to admit they fell asleep on the job, especially if an accident results.

Is fatigue a big problem?

Approximately 63 million Americans suffer from moderate or severe daytime sleepiness. Because of this, on-the-job concentration, decision making, problem solving, and performance are adversely affected. Forty percent of adults say their daily sleep is inadequate. Many of the over 25 million shift workers in the U.S. find it impossible to stay alert during their night jobs because of inadequate sleep during the day.

When is fatigue worse?

Our biological rhythms are set to 24-hour cycles by exposure to daylight, knowledge of clock time, meal intervals, and activity schedules. Because of this, we feel sleepier at nighttime and don't perform as well as we do in the day. Alertness is greater during the day than at night.

What is the cost of fatigue?

Fatigue costs 18 billion dollars in U.S. industrial productivity every year. Fifty percent of aviation mishaps are caused by human error, and fatigue is thought to be directly responsible for many of these.



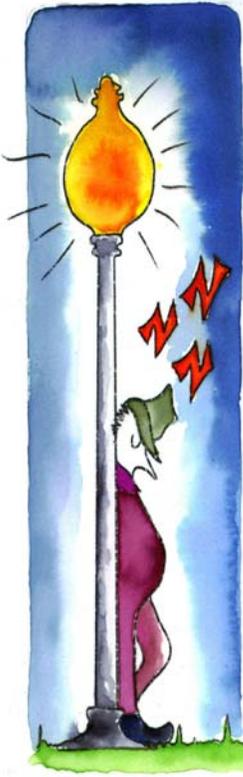
Why are we so tired?

Inadequate sleep and extended periods of wakefulness are the two main causes of fatigue.

Many Americans sleep less than 6.5 hours per day (far below the recommended amount of 7.5 to 8 hours). Shift workers receive even less. This adversely affects job productivity, personal safety, and well being.

What are the warning signs of inadequate sleep?

Indicators of inadequate sleep include:



- Difficulty waking up without the aid of an alarm clock.
- Repeatedly pressing the snooze button to sneak in a few extra minutes.
- A strong desire to take naps during the day.
- Difficulty staying awake while in meetings, riding in a car, or watching TV.
- Falling asleep in less than 7 minutes after going to bed at night.
- Looking forward to weekends when one can "catch up on sleep."
- Sleeping 2 or more hours than usual on days off.

How much sleep is necessary for alertness?

Most adults need about 8 hours of nightly sleep in order to be fully alert during the day, but there are individual differences. The only way to establish your sleep requirement is by trial and error. Determine your sleep needs and then ensure you receive enough to maintain on-the-job alertness.

How much sleep is right for me?

Two ways to determine your sleep needs:

While on vacation. Sleep without an alarm clock for several days, and record the amount of nightly sleep you receive. The average is how much sleep you naturally need. When trying this, begin keeping records on the third day, after you've overcome any pre-existing sleep debt.



While on your regular work schedule. For a week, increase your usual amount of nightly sleep by 1 hour. At the end of the week, evaluate how alert you feel each day. If more sleep is needed, add an hour the next week and so on.

Can I train myself to need less sleep?

No. Simple tasks can be made resistant to sleep loss by practicing them until they become automatic; but this will not work with tasks that require vigilance, thought, and/or judgement. Sleep deprived individuals perform poorly, but often are unaware of their level of impairment.

How can I improve my nightly sleep?

Sleep problems often stem from behavioral or environmental factors. If you repeatedly are unable to fall asleep at night, do the following:

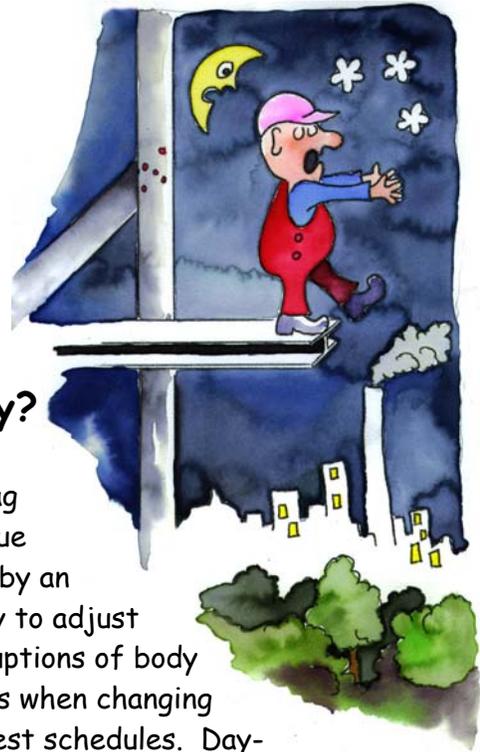
- Stick to a consistent bedtime and wake-up time.
- Use the bedroom only for sleep.
- Develop a soothing nighttime routine (read or take a warm bath just prior to going to bed).
- Resolve daily problems before bedtime.
- Once in bed, avoid watching the clock.
- Include aerobic exercise in your daily routine, but not within 3 hours of bedtime.
- Don't take naps during the day.
- Don't consume caffeine within 4 hours of bedtime.

- Don't drink alcohol within 3 hours of bedtime.
- Don't smoke cigarettes within an hour before going to bed.
- If you can't fall asleep, don't lie in bed awake. Instead, do a quiet activity until sleepy.

Correcting problems due to poor sleep practices may take several days or weeks.

Does shift work make me sleepy?

Shift lag is fatigue caused by an inability to adjust to disruptions of body rhythms when changing work/rest schedules. Day-time sleep is not normal and because of this and other factors, night workers tend to get 2-4 hours less sleep than day workers. It is difficult for workers to adjust to new schedules.



How do I adjust to a new work shift?

The following can help you adjust to a new schedule and minimize how long feelings of fatigue and discomfort will last:

- Maintain the new sleep/wake schedule, even when off duty.
- Adjust meal times to agree with the new schedule.
- Talk to friends and family about your need to sleep at a different time than they do.
- Unplug the phone, disconnect the doorbell, put blackout shades on the windows, and turn on a fan to mask out noise.
- Take naps if it's impossible to get an 8-hour block of sleep.
- If possible, (with flight surgeon permission), use a sleeping medication for the first 3 days to promote sleep.
- Timely use of caffeine can enhance on-the-job alertness, but don't use caffeine within 3 - 4 hours before your scheduled sleep period.
- If trying to sleep during the day, minimize morning light exposure with dark glasses and avoid being outside before bedtime.

How can I improve my alertness on night shift?

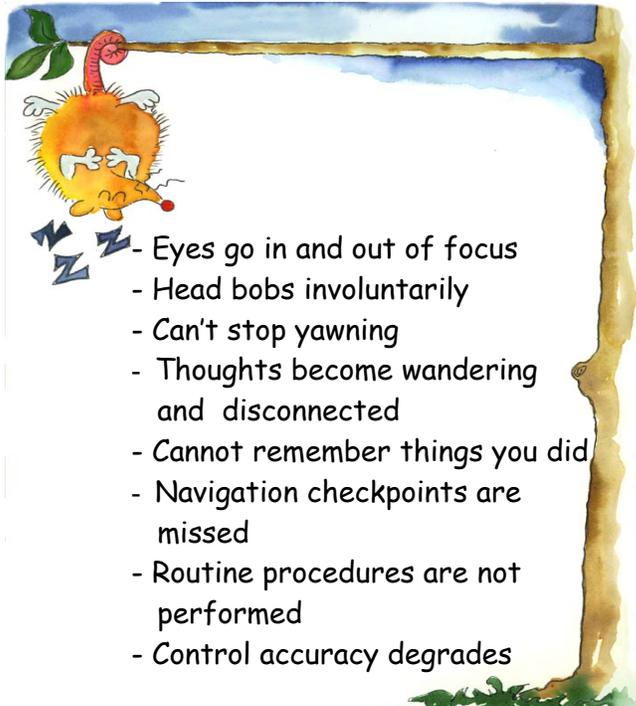
Avoiding fatigue during night flights is difficult. If there is no flexibility in establishing when a flight will take place, the following strategies should be implemented:



- Obtain plenty of sleep before the flight.
- If the flight is late in the day or at night, take a 45-minute nap before takeoff.
- Avoid alcohol consumption within 24 hours prior to night flights.
- During the flight, swap tasks between pilot and copilot to minimize boredom.
- Consume caffeine immediately before and/or during the flight.
- Whenever possible, move around or walk around.
- Note that increasing radio volume and exposure to cold air do not fight off sleep.
- Remember that after being awake for a long time, you may involuntarily fall asleep, despite your best efforts.

What are some fatigue warning signals?

When there is no choice but to fly when tired, be aware of these indicators that you are at serious risk for falling asleep:



- Eyes go in and out of focus
- Head bobs involuntarily
- Can't stop yawning
- Thoughts become wandering and disconnected
- Cannot remember things you did
- Navigation checkpoints are missed
- Routine procedures are not performed
- Control accuracy degrades

If you experience even one of these symptoms, the safest course of action is to end the flight as soon as possible and get some sleep.

Can napping really help?

Research studies have shown that long naps can help restore the performance of sleep deprived people to near normal levels. Also, naps taken shortly before a period of sleep deprivation can improve alertness and performance.



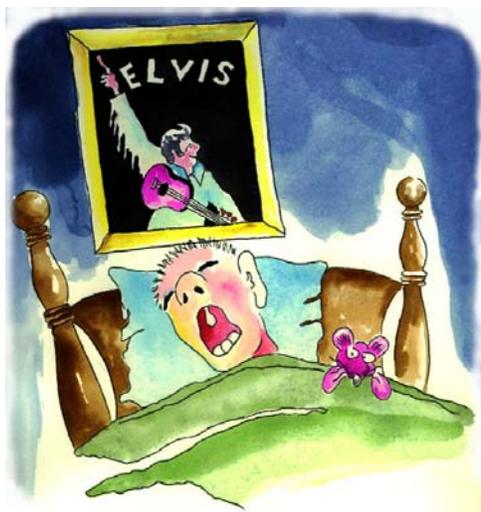
How long should a nap be?

The longer the nap, the better its ability to lower the impact of fatigue. Although 2-hour naps will not restore performance to normal levels, they are very beneficial because they provide sufficient time to go to sleep and complete one full sleep cycle. However, short naps of only 30-45 minutes are far better than getting no sleep at all. Even a 10-minute nap is better than nothing.

How should I plan my naps?

When implementing naps, do the following:

- Establish a relatively quiet, dark, and comfortable place for napping.
- Use sleep masks or earplugs if necessary to block out sunlight and noise.
- Place the nap when sleep is naturally easy (1400-1600 or 0300-0600), if possible.
- Make the nap as long as possible.
- Consider napping in the afternoon prior to an all night mission.
- Plan the nap early in the sleep deprivation period.
- Allow 15-20 minutes after awakening to become fully alert before resuming work tasks.



No nap, now what???

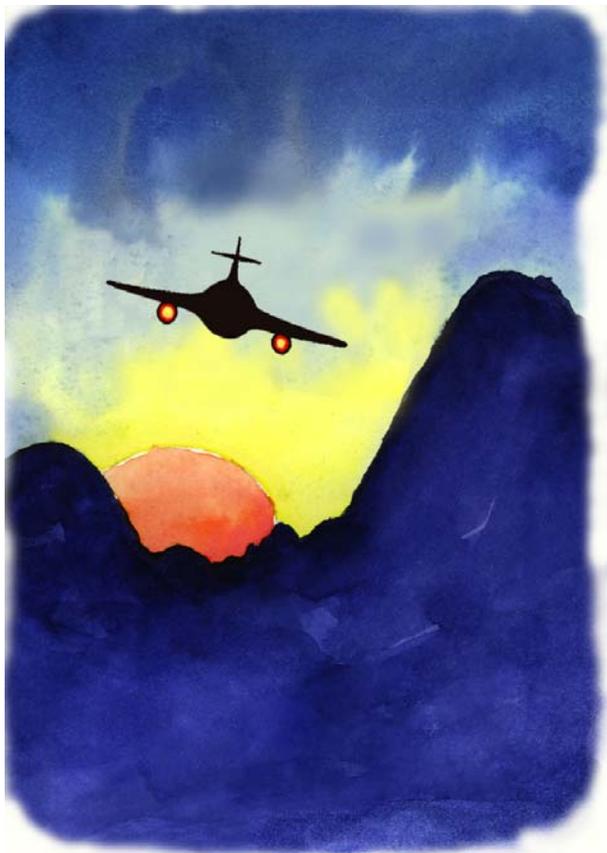
Pilots who find themselves in situations where the flight must be done despite inadequate sleep and heavy fatigue should:

- Be sure to eat high protein foods like yogurt, cheese, nuts, and meats.
- Avoid high fat foods (candy bars and potato chips) and high carbohydrate foods (sweets, cereals, and breads, etc.).
- Drink plenty of fluids.
- Converse with other crew members and rotate tasks to minimize boredom.
- If possible, try to move around in the cockpit. Definitely exercise whenever possible.
- Consume caffeine once fatigue becomes noticeable.
- In combat situations, request a stimulant such as Dexedrine®.

Remember that any of these counter-measures (with the exception of Dexedrine® and possibly caffeine) are only minimally effective after someone has been awake for 18 hours or more. Even the most powerful, prescription amphetamines are no substitute for sleep!!

AWAKE AT THE THROTTLE!!!!

Recognizing the threat posed by on-the-job sleepiness, identifying the causes of insufficient sleep, implementing counter-measures to ensure proper rest, and developing crew rest cycles that will ensure well-rested and alert crews is the best defense against fatigue.



The views, opinions, and/or findings contained in this brochure are those of the author and should not be construed as an official Department of Defense position, policy, or decision.

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