Tips to Help Minimize Jet Lag

- Adjust your bedtime by an hour a day a few days before your trip. This will adjust your sleep pattern to match the sleep schedule you will keep at your destination
- Reset your watch to the destination time at the beginning of your flight to help you adjust more quickly to the time zone you will be visiting
- Drink plenty of water before, during, and after your flight. The air you breathe on airplanes is extremely dry, and some experts believe that dehydration is a predisposing cause of jet lag. Virtually everyone agrees that dehydration can make jet lag worse
- Eat lightly but strategically. What you eat can have a direct influence on your wake/sleep cycle. Remember that high-protein meals are likely to keep you awake, while foods high in carbohydrates can promote sleep, and fatty foods may make you feel sluggish
- Relax on the first day at your destination. If you have the luxury of arriving at your destination a day or two before you have to engage in important activities that require a lot of energy or sharp intellectual focus, give yourself a break and let your body adjust to the time change a little more gradually
- **As a Passenger:**
  - Avoid drinking alcohol or anything with caffeine in it during your flight (includes many soft drinks, coffee, and tea.) Both alcohol and caffeine increase dehydration
  - Sleep on the plane if it is nighttime at your destination. Use earplugs, headphones, eye masks, or other sleep aids to help block out noise and light, and a travel pillow to make you more comfortable so you can sleep
  - Stay awake during your flight if it is daytime at your destination. Read, talk with other passengers, watch the movie, or walk the aisles to avoid sleeping at the wrong time

CRD Affects Your Flying Skills

CRD-induced fatigue that goes untreated or ignored will have both physiological and psychological ramifications that not only can jeopardize your personal health but can also become a safety-of-flight issue. A few of the more well known undesired personal affects are:

1. Increased reaction time

- Impaired responses in sequential tasks that require time synchronization
- Need to increase the magnitude of sensory stimulation to elicit response

2. Decreased attention

- Omission or displacement of individual elements in sequential task
- Channelized attention to one task at the expense of other
- Impaired visual monitoring patterns
- Difficulty in self-identifying performance impairment

3. Impaired memory

- Difficulty remembering recent events during flight
- Tendency to forget secondary tasks

4. Personal conduct of isolation

- Tendency to avoid interpersonal interactions
- Tendency to avoid tasks that require low workload
- Increase distraction due to discomfort
- Emotional irritability
- Indifference

Consequences of CRD on the Flight Environment

- Increased frequency and severity of piloting errors during aircraft operations
- Increased frequency of operational incidents
- Increased risk in aviation operations

Resetting Your Biological Clock and Recovering

Once you have fallen victim to CRD, it is imperative to reset your biological clock. Here's how:

- **Catch Some Rays.** Exposing yourself to as much daylight as possible might also be a good idea, because it has been scientifically shown that bright light helps reset circadian rhythms. In addition to resetting the clock, light has a direct and positive affect by increasing brain serotonin levels. At the same time, circadian light therapy has a depressing affect on daytime melatonin, a clear link to depression and sleep disorders
- **Be Active.** When you arrive, taking a nap is the worst thing you can do because it sets your body's rhythms back to home time. Staying active on arrival will help the body adjust to the new time zone. Eating and sleeping are your body's time indicators, so it's important to fit in with what the locals are doing when you arrive. Consequently, if it's breakfast time, eat breakfast

Coping With CRD While On Duty

- Sleep well at home before any flight
- Try to get at least as much sleep per 24 hours as you would normally at home
- If you are sleepy, try to sleep. Employ strategic (combat) napping techniques
  1. Whenever possible, take a 30-minute nap prior to a long flight
  2. Avoid naps of more than 30 minutes, as they involve deep sleep
  3. Taking a nap is better than not sleeping at all
- Avoid pilot adaptation to a local circadian rhythm following transmeridian flights with short layovers
- Try to maintain the circadian rhythm from your place of origin, and at the same, time try to sleep longer
- Use caffeine strategically during the flight to counteract circadian rhythm sleepiness
- While in the cockpit seat, converse with others, stretch your legs, and take regular breaks
- Try to avoid night flights following a transmeridian flight
- Transmeridian flights should be alternated with intrameridian flights, enabling you to return to your normal circadian rhythm

Remember, circadian rhythm disruption can lead to acute or chronic fatigue. Fatigue in the cockpit has shown to be just as debilitating as drugs and alcohol. Do not let CRD-induced fatigue become a hindrance to aviation safety.

Medical Facts for Pilots

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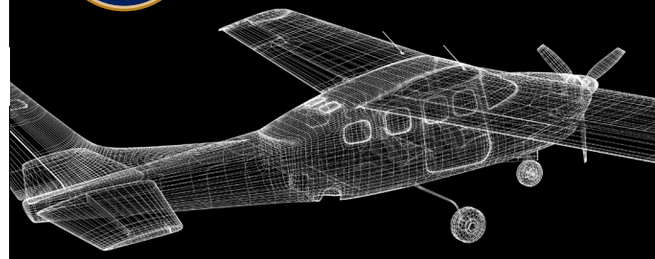


Circadian Rhythm Disruption and Flying

Circadian Rhythm Disruptionand Aviation

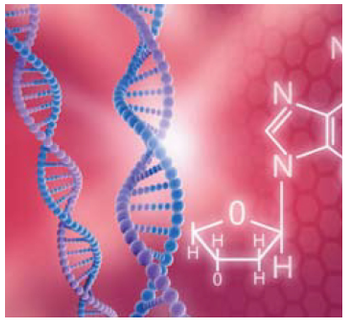
It's All About the Rhythm and Blues

Our body's biological functions work much like a finely tuned watch: Every part works in unison to keep the body in homeostasis (maintenance of the internal environment within tolerable limits). However, when one working part doesn't function normally, it tends to disrupt many other vital parts and can upset homeostasis.

Often, we bring disruptions on ourselves with such things as self-imposed stress, and then we must try to get everything back to normal.

Managing your circadian rhythm is no different. It must be maintained to operate within normal working parameters, or a variety of negative effects will occur, and some of these could become a safety-of-flight issue.

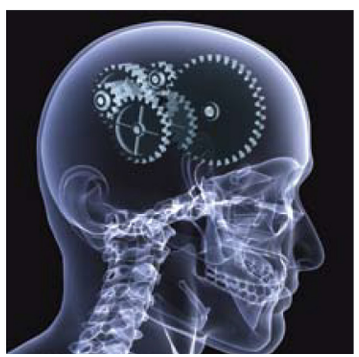
An Internal Biological Clock



Our circadian rhythm is best described as an internal biological clock that regulates our body functions, based on our wake/sleep cycle. Circadian rhythms are not only important in determining sleep cycles but also in feeding patterns. There are clear patterns of brain wave activity, hormone production, cell regeneration, and other biological activities linked to these daily cycles.

Origin

Circadian rhythms are believed to have originated in the earliest cells, with the purpose of protecting replicating DNA from high ultraviolet radiation during the daytime. As a result, replication was relegated to the dark, and a basic pattern of day/night cycle was engrained within the cell and passed down to subsequent generations. At some time in the distant past, the days may have been longer, because when we are deprived of time clues, we gravitate toward a 25-hour circadian cycle.



The Internal Works of Our Biological Watch

In your brain, there is a type of "pacemaker" located within the suprachiasmatic nuclei. This area regulates the firing of nerve cells that seem to control your circadian rhythm. Scientists can't explain precisely how this area in your brain "keeps time." They do know your brain relies on "outside" influences called zeitgebers (German for time givers) to keep it on a normal schedule.

The most obvious zeitgeber is daylight. When daylight hits your eyes, cells in the retinas signal your brain. Other zeitgebers are ambient temperature, sleep, social contact, physical activity, and even regular meal times. They all send "timekeeping" clues to your brain, helping keep your circadian rhythm running on schedule.

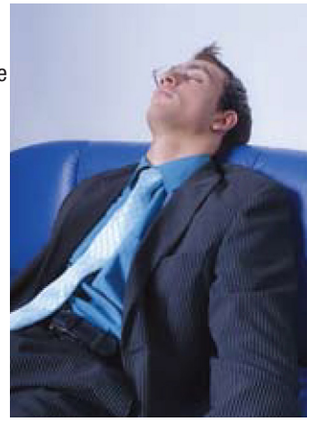
Circadian Rhythm Disruption

Any time that our normal 25-hour circadian rhythm is altered or interrupted, it will have physiological and behavioral impacts. This is better known as circadian rhythm disruption, or CRD. Normal circadian rhythms are naturally altered as one ages including changes in sleep pattern with respect to earlier onset of sleepiness, early-morning awakenings, and increased need for daytime napping.

Sleep Disorders and CRD

Several chronic sleep disorders can lead or contribute to circadian rhythm disruptions, including:

- **Delayed Sleep Phase Syndrome.** This disorder causes a delay in the normal sleep onset time by two or more hours. People affected by this disorder complain of late-evening insomnia and/or excessive early-morning sleepiness, have difficulties falling asleep before 2:00 a.m., have short sleep periods during weekdays, and prolonged (9-12 hours) sleep periods during the weekends. These individuals tend to experience depression and other psychiatric disorders
- **Advanced Sleep Phase Syndrome.** This is a disorder where sleepiness occurs well before the desired sleep schedule. The resulting symptoms include evening sleepiness, an early sleep onset, and an morning awakening that is earlier than desired. A person feels the urge to go to sleep between 6:00 and 8:00 p.m. and wakes up between 1:00 and 3:00 a.m. the following morning. This disorder can have a negative impact on an individual's personal or social life because of the need to leave early-evening social activities to sleep. Evening sleepiness may also represent a driving hazard
- **Non 24-Hour Sleep-Wake Disorder.** This disorder is the result of an inadvertent delay of the sleep onset time, followed by unsuccessful attempts to sleep at the desired sleep schedule. People affected by this disorder constantly delay sleep onset times that interfere with circadian rhythms. They have a normal sleep duration pattern but live in a free-running "biological clock" of 25 hours instead of the community-accepted 24-hour clock. The sleep cycle is affected by inconsistent insomnia that occurs at different times. Those affected will sometimes fall asleep at a later time and wake up later; or fall asleep at an earlier time and wake up earlier



Even if you do not have a chronic sleep disorder, there are several measures that can help you get a good night's sleep. Among these are:

- Mental or physical relaxation techniques (reading, meditation, yoga)
- If you don't fall a sleep within 30 minutes of going to bed, get out of bed and try an activity that helps induce sleep such as reading, listening to relaxing music, watching something boring on TV, etc.
- Ensure you are in an environment conducive to sleeping (dark, quiet, comfortable temperature and mattress)
- Exercise regularly, but not too near bedtime
- A nutritious, balanced diet

Shift Work and CRD

Shift work almost always causes a circadian rhythm disruption—the internal body clock is at odds with the shift schedule. Shift-work problems are well documented, ranging from performance issues to accidents and health problems.

Recognizing Circadian Rhythm Disruption

Pilots or passengers who are suffering from CRD may experience one or more of the following symptoms:

- Difficulty falling and staying asleep, late-night insomnia
- Increased daytime sleepiness
- A general lack of energy in the morning
- An increase of energy in the evening or late at night
- Difficulty concentrating, being alert, or accomplishing mental tasks
- Oversleeping and trouble getting up
- Increased negative moods

The most debilitating symptom of CRD is, of course, fatigue. Fatigue is typically characterized by:

- General discomfort
- Sleepiness
- Irritability
- Apathy or loss of interest
- Decreased concentration
- Loss of appetite
- Impaired sensory perceptions
- Mood changes
- Impaired decision-making

Fatigue, itself, is a very dangerous condition for any pilot attempting to operate an aircraft. Realizing the cause of the fatigue (in this case, CRD) is the first and most important step in treating it.

Jet Lag is a CRD!

Of all the stressors in aviation, **jet lag**, or **rapid time zone change syndrome,** seems to have the biggest impact. This syndrome consists of symptoms that include excessive sleepiness and a lack of daytime alertness in people who travel across time zones.

Other Symptoms: Fatigue, insomnia, disorientation, headaches, digestive problems, lightheadedness.

Jet lag is more evident if you fly from west to east because it is more difficult for your body to adjust to "losing time" when you journey east than to "gaining time," when you fly from east to west.