

CFI Bootcamp

Flight Instructor Training



Aeromedical

Fatigue Science for Professional Pilots

Managing Strategies

Today's Bootcamp+ Network Programming

What's on for Today?



Live Show – 1st Hour – Wings Credit
Open Mic – 2nd Hour – End
Monitor the Chat – Links/Info
Wings Credit - End of the Live Show

Today's Bootcamp+ Network Programming

What's New?



PH Rebroadcasts Wed evenings 8pm Eastern

Powerhour Podcasts – Full shows
New CFI Aeronautical Knowledge Gaps Course set for release

Why Fatigue Matters in Aviation

- Nearly 33% of accidents list fatigue as a contributing factor
- 20 hours of sleep deprivation = BAC 0.08%
- After one night without sleep = 50% reduction in cognitive ability
- Between 0200-0600 (Circadian Trough) 3x more likely critical errors



Circadian Rhythm



Jet Lag

- 1 day per time zone – East worst – pushing against natural drift
- Internal Desynchrony – Organs reset at different rates
- Sleep Architecture Disrupted – REM/Slow-wave reduced (affects memory consolidation and motor learning)
- Performance Low Point on Day 1-3 – Greatest impairment occurs AFTER arrival, not during the flight itself



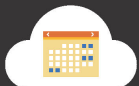
Variable Shifts

- Cutting sleep by 90 min/night for 2 weeks = 36 hours awake – Pilots report feeling only slightly sleepy
- Roster Irregularity – Clock can't train on a moving target – Creates chronic sleep debt and micro-sleep risk
- Cumulative Fatigue - Sleep debt accumulates – Performance on day 4 or 5 is significantly worse than day 1 – even if rules are followed



8 SLEEP STRATEGIES FOR SHIFT WORKERS

The military works around the clock to provide critical mission coverage. Improve your sleep with these tips when working non-traditional hours.



KEEP A CONSISTENT SLEEP SCHEDULE

Stay on the same sleep schedule even on your days off. For rotating shift workers, adjust your sleep time before a schedule change to prevent disruption.



DON'T DELAY GOING TO BED

Go home to sleep as soon as your night shift is over. The longer you put off sleep the more likely you are to feel awake due to your body's internal clock.



CREATE THE RIGHT SLEEP ENVIRONMENT

Make sure your bedroom is cool, dark and quiet. If your bedtime is during the day, try using a sleep mask, blackout curtains, earplugs and/or a noise canceling machine or app for better sleep.



MANAGE SCREEN & LIGHT EXPOSURE

Avoid electronic screen time before bed since blue light may make it harder to fall asleep. If it's daylight on your way home from work, wear a pair of sunglasses to limit light exposure from the sun.



SHARE YOUR SLEEP SCHEDULE

Let your family or roommates know when you will be working and when you need to rest. This can help prevent conflict and sleep disruptions.



NAP STRATEGICALLY

Try taking a nap before your night shift. Whether you have a bed available or just a rucksack, napping can be a great tool to combat sleep loss, improve alertness and performance on the job.



WATCH WHAT YOU DRINK BEFORE BED

Avoid caffeine and alcohol close to bedtime. Although you might fall asleep faster after a drink, alcohol may disrupt the quality of your sleep.



EAT LIGHT SNACKS AT NIGHT

Choose light snacks during night shifts and stay hydrated to help prevent drowsiness and digestion problems.

WANT MORE RESOURCES?

Psychological Health Resource Center

Call/Chat with a health resource consultant 24/7 for assistance accessing care at 866-966-1020 or health.mil/PHRC.

Military Crisis Line

In the U.S., dial 988 then press 1 or text 838255. For OCONUS calling options and online chat accessible from anywhere in the world, visit militarycrisisline.net.

Connect with Us on Social Media

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REAL WARRIORS + REAL BATTLES
REAL STRENGTH

Visit health.mil/RealWarriors for more information.

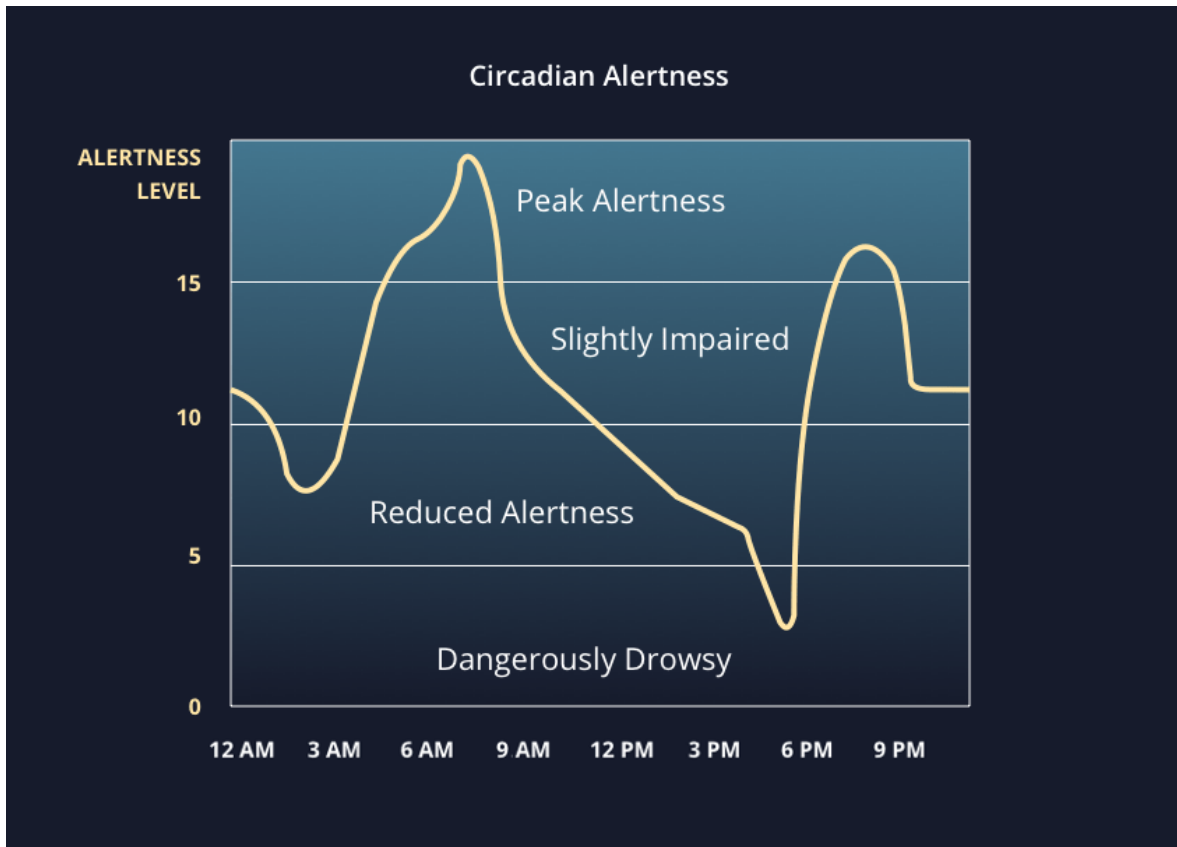
UPDATED FEBRUARY 2024

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Overnight Sim Checks, Line checks and Tests

- Circadian Trough Peaks 0200-0600
- Procedural memory is most vulnerable – Checklist use example
- Micro-Sleeps are invisible to the pilot – 2-30 second episodes

Circadian Cycle During a Typical Day



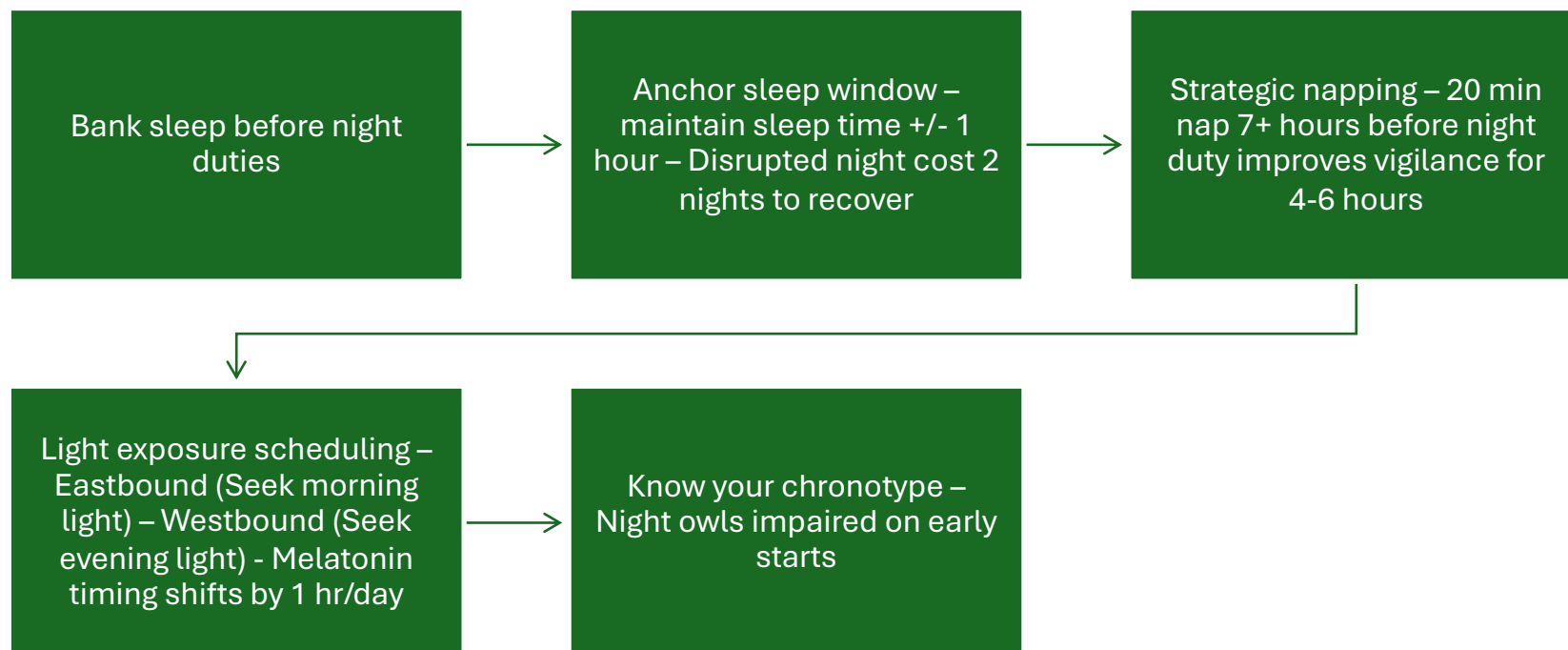
Cognitive Function and Reaction Time

- 17 hrs. awake – Cognitive impairment – 0.05BAC, 24 hrs. – 0.10%
- Long-haul crews – 50-80% degradation in vigilance during night sectors

Fatigue and Flight Safety – Case Studies

- Colgan 3407 – Fatigue played a part
- China Airlines CI006 – Crew unaware of deviations >20 sec
- NASA ASRS – 21% fatigue cited
- UK CAA Study – 50% long-haul pilots reported falling asleep on the flight deck unintentionally at least once

What We Can Do



On-Duty Techniques

- Cockpit Napping – 40 min opportunity yields 26 min sleep – 1-2 hrs
- Caffeine – 200mg 30 min prior to need – avoid <6 hours of sleep
- High-energy phase task sequencing – Demanding tasks for higher alertness windows
- Cross-check verbalization – Challenge-response



Jet Lag Mitigation Pre-Departure (Non Crew)

- Shift sleep 1 hr earlier eastbound or later westbound for 3 nights
- Set watch/phone to destination time on boarding
- Hydrate – 250ml water per hour of flight

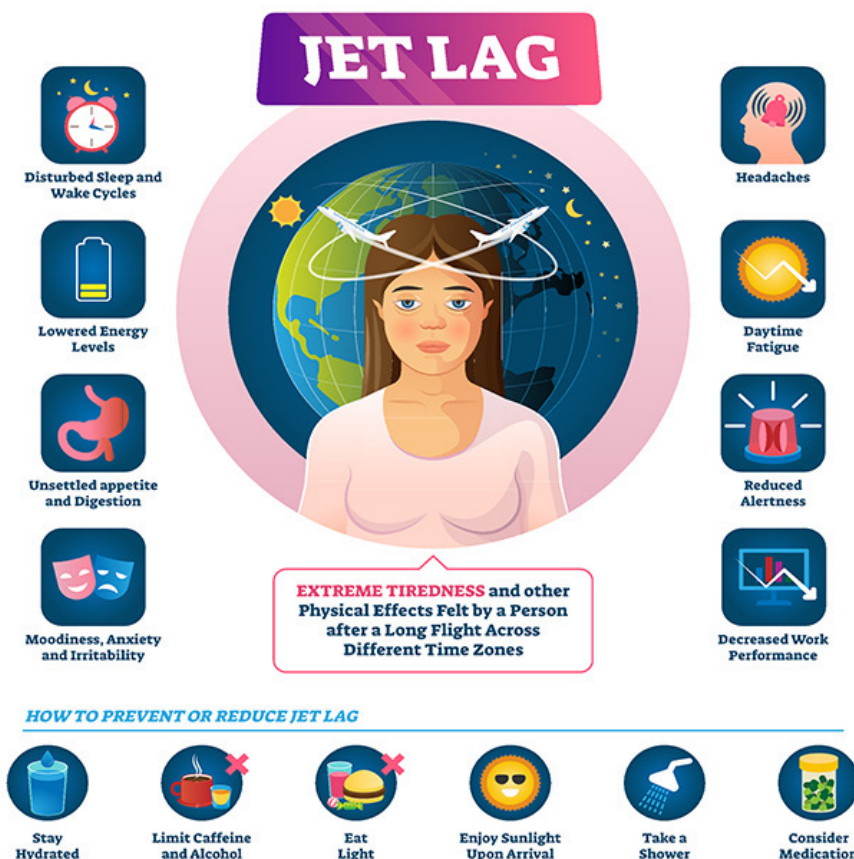
Jet Lag Mitigation In-Flight (Non Crew)

- Sleep on the plane if it's night at destination
- Use melatonin 0.5-3mg at destination bedtime
- Avoid alcohol and minimize caffeine

Jet Lag Mitigation Post-Arrival (Non Crew)

- Get outdoor daylight exposure at the right local time
- Eat meals on local schedule immediately
- Short nap (<30 min) if needed – Don't anchor to home time

Jet Lag Mitigation Post-Arrival (Non Crew)



Preparing for Overnight Sim/Line Checks

- Shift sleep 3 days prior
- 200 mg caffeine 1 hr before briefing – avoids trough impairment
- Nap strategically on the day – 90-min sleep opportunity at 1800 (one sleep cycle) reduces sleep pressure without sleep inertia



10 Evidence Based Tips to Combat Fatigue

- Protect 7-9 hours sleep
- Bank extra sleep 3 nights before night duties
- Nap: 20 min for quick recharge / 90 min for full sleep cycle
- Use caffeine strategically – not reactively
- Expose yourself to bright light to anchor your clock

10 Evidence Based Tips to Combat Fatigue

- Use melatonin (0.5-3mg) to shift your circadian phase when crossing time zones
- Eat meals on destination local time as soon as possible
- Declare fatigue
- Use circadian planning tools - Timeshifter
- Brief crew on fatigue state – Changes CRM

Special Announcement!

Reminders!



CFI Study Group on FaceBook



National Association of
Flight Instructors

Join SAFE, NAFI and the CFI Study Group by Clicking on the Images Above

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