



Medical Learner Fatigue: Recognition and Mitigation

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DeBusk College of Osteopathic Medicine
LINCOLN MEMORIAL UNIVERSITY

VALUES | EDUCATION | SERVICE

Objectives

- To provide background on sleep as it pertains to medical professionals with an emphasis on identifying signs and symptoms of fatigue
- To remind learners of what to do if they, or a colleague, or a student under their supervision is showing signs of fatigue at work/while training

Disclosure

- I have no actual or potential conflict of interest in relation to this program/presentation



Scenario #1:

A third-year medical student who wants to go into pediatrics has been working with the chief resident doing 12-hour night float shifts for the last two weeks. The attending felt this would be “good practice” for when she gets into “the real world” of internship and residency. She consistently finds night shift work more tiring and has noticed signs of increased fatigue despite sleeping at least eight hours during the day and following other recommendations to decrease fatigue. She is scheduled for her last night shift on Sunday and is supposed to start a pediatric critical care elective rotation on Monday. This will involve joining the team caring for 18 moderately to severely ill children. These will be completely new patients for her, and she does not feel that she will be able to contribute to the care of all these children for the subsequent 12 hours after being up all night. She brings her concern to the pediatric chief resident and preceptor/attending.

Reflection/Discussion

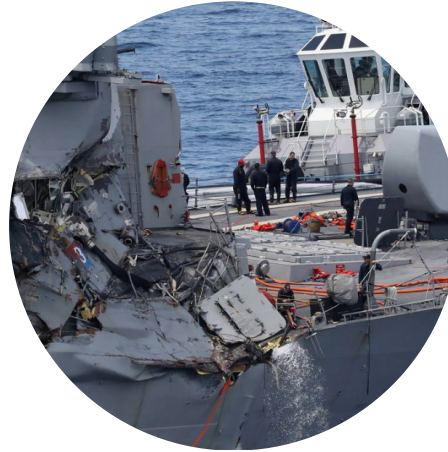
- As preceptor, what do you advise and why?
- Does your response prioritize patient safety (e.g. concern for medical errors with fatigue)?
- Does your response prioritize student safety (e.g. concern for student well-being, driving home at the end of the shift, etc.)?
- Does your response conceptualize fatigue as an industry and safety issue or as a personal challenge to be overcome?
- Are you contributing to the cultural of medicine that sees fatigue as something that is inescapable and can be surmounted when necessary?

- Are preceptors for your medical school modeling not working when fatigued? Does the medical school empower impaired students taking themselves out of clinical work?
- Where do your beliefs about fatigue come from (e.g. family/childhood, learned from medical training, societal beliefs, personal experience, etc.)?
- If you thought a medical student was struggling from fatigue, when would you intervene? What recommendations would you make?
- How are medical students informed about fatigue at your clinical rotation site?
- What is the hidden curriculum about fatigue in medical school/internship/residency and beyond?

2023 COCA Accreditation Standard²

- Element 5.3: Safety, Health, and Wellness
- A COM must publish and follow policies related to student, faculty, and staff mental health and wellness, and fatigue mitigation in the clinical learning environment.
- Submission 5.3: Safety, Health, and Wellness
 1. Provide policies and procedures addressing safety and health issues.
 2. Provide a link to the webpage to where safety, health, and wellness information is published.
 3. Describe how this information is provided to students, faculty, and staff.





Sleep as it Pertains to Public Health & Safety



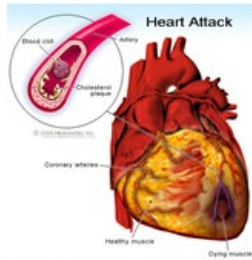
Colds, respiratory infections



Depression



Insufficient Sleep < 7 hours



Coronary Heart Disease

Obesity

Diabetes

Substance Use

Early Mortality

Sleep and Individual Health

What controls sleep?

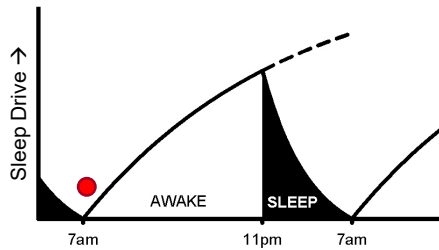
The HOURGLASS
How long you've been awake



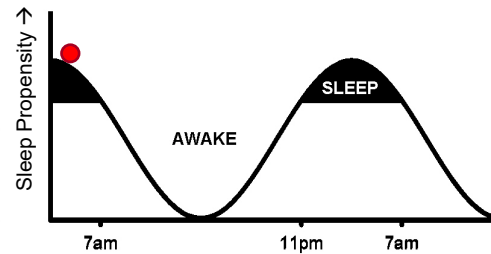
THE CLOCK
Time of day



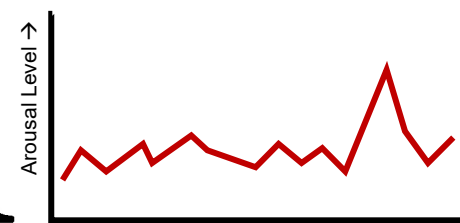
THE ALARM
Level of arousal



Sleep drive



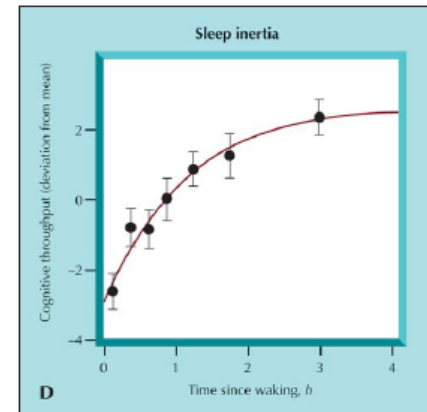
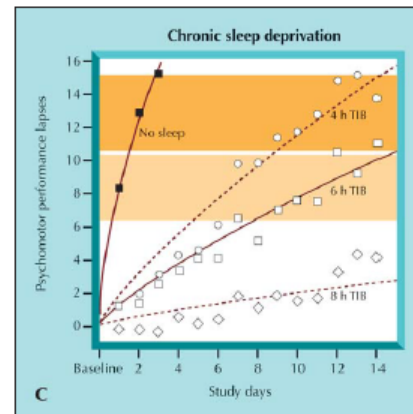
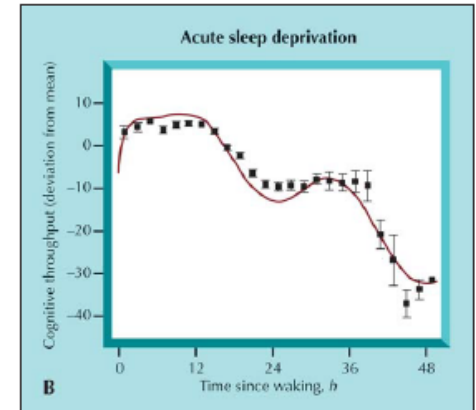
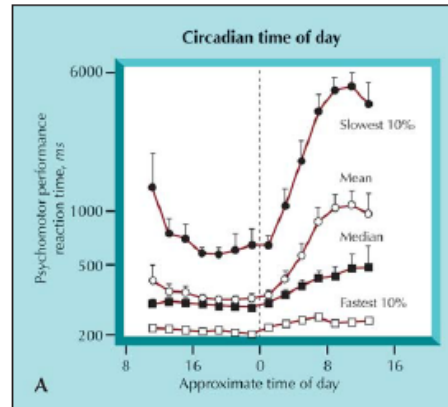
Circadian sleep-wake rhythm



Moment-to-moment arousal

Alertness and Performance

- **Number of hours awake** (acute sleep loss): Performance quickly deteriorates with no sleep, but slower if we get 4, 6, or 8 hours
- **Circadian phase** (time of day): Reaction time and consistency are worse in the middle of the night
- **Nightly sleep duration** (chronic sleep loss): Performance worsens the more nights we have of restricted sleep
- **Sleep inertia:** It takes > 1hr to fully wake and function efficiently



Barger, *J Curr Neurol Neurosci Reports* 2009; 9:155-164

In comparison to intoxication

Lamond and Dawson, *J Sleep Res*, 1999; 8:255-262

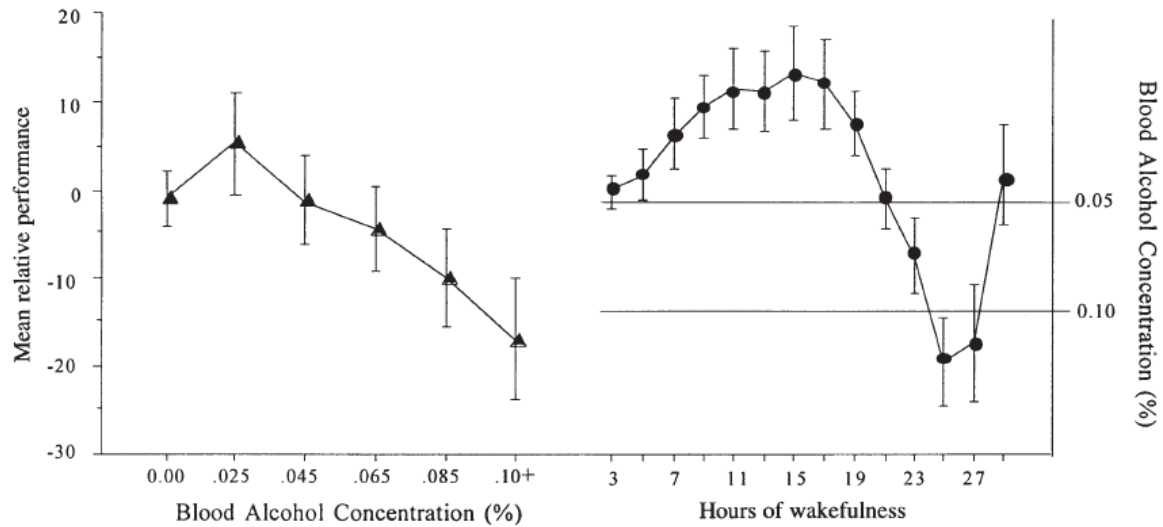
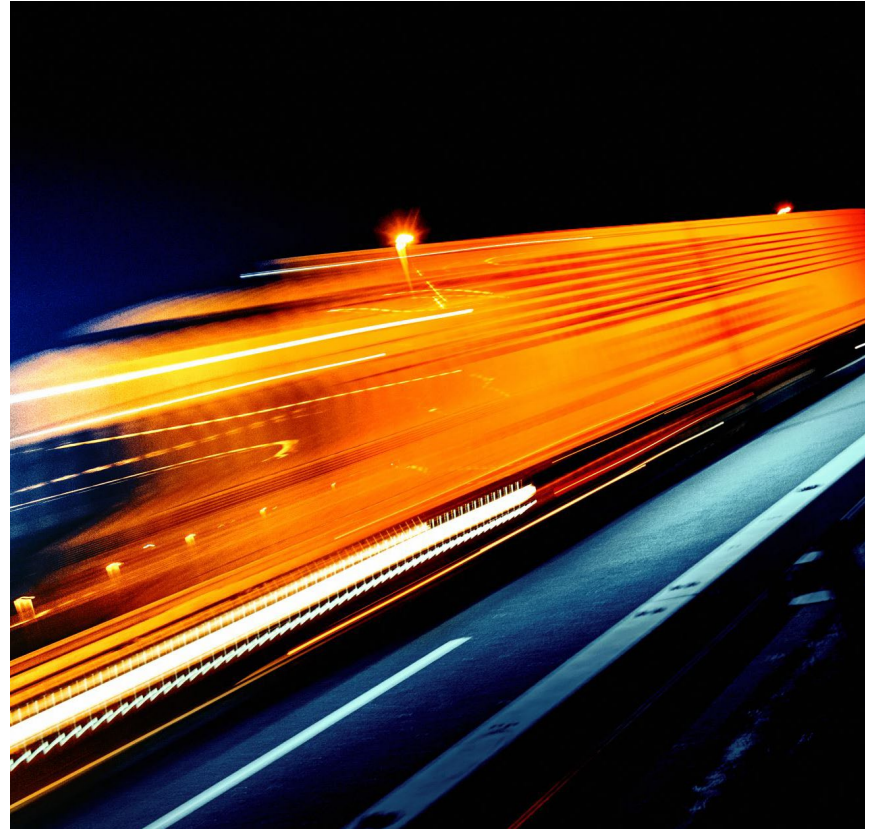


Figure 5. Mean relative performance levels for the unpredictable tracking task in the alcohol intoxication (left) and sustained wakefulness condition. The equivalent performance decrement at a BAC of 0.05% and 0.10% are indicated on the right hand axis. Error bars indicate ± 1 SEM.

Signs of Drowsy Driving

- Trouble focusing on the road
- Difficulty keeping your eyes open
- Nodding off
- Yawning
- Drifting from your lane or missing signs or exits
- Not remembering driving the last few blocks/miles
- Closing your eyes at stoplights



Safety regarding driving when fatigued

NONE of these help:

- Turning up the radio
- Opening the window
- Chewing gum
- Slapping or pinching yourself
- Washing your face with cold water

Make the smart choice before getting behind the wheel. Nap before driving or get a ride if you are overtired!!!



Scenario #2



Scenario #2

You are a general surgery preceptor with 2 OMS IV students with you this month, one of whom wants to go into OB-GYN, the other Emergency Medicine. On home call last night, you had several consults, in addition to an emergency appendectomy in the middle of the night. The OMS IV students joined you for these calls and the case. You have explained how “learning to manage fatigue and stay sharp when tired is part of the real day to day life of a surgeon”. You stayed “in house” and napped between consults telling the students, “Being a surgeon means putting patient needs first. I admitted them, I follow them. Too many things can fall through the cracks in a hand off.” Since this was officially home call, the hours do not violate the student hour restrictions.

The students got a few hours of fragmented sleep before returning for early morning rounds. Both students report they feel “pumped” after the double espressos they grab in the physician’s lounge. As you finish your own double espresso, you invite one of the students to join you on a Whipple operation. However, after you have scrubbed into the case, as the student dutifully holds open the abdominal wall, you notice her lack of consistent retraction and look up to find her struggling to stay awake and repeatedly nodding off. As her preceptor, you instantly recognize her level of fatigue and tell her to scrub out of the case.

Discussion

- When you were a 4th year medical student, how would this behavior have been treated by your attending/precepting physician?
- What are your thoughts and emotions surrounding recognizing a fatigued learner? Did the preceptor in this scenario set a good example of how to manage/mitigate fatigue?
- As a preceptor, would you view this OMS IV student as “weak” because of her inability to “hang with the big dogs” on surgery? Why or why not?
- What debriefing/discussion will you have with the OMS IV student or both students after the case? What will your talking points be?
- Who would you recommend the student reach out to for help?
 -
- What could you have done to minimize and/or avoid this situation occurring in the future?

Fatigue culture vs. Safety culture : the “hidden” curriculum

Factors contributing to fatigue in training – “a perfect storm”

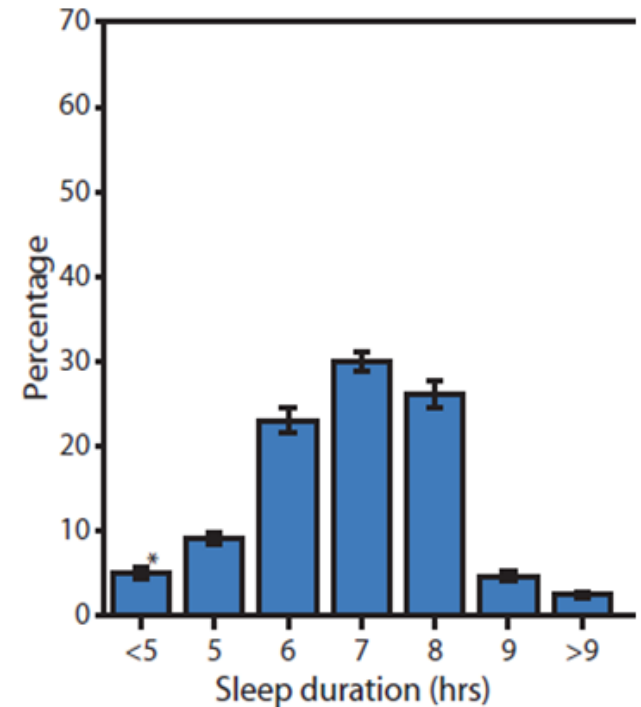
- Prolonged wakefulness
- Reduced and disturbed sleep periods
- Volume and intensity of work
- Shift variability
- Functioning at adverse circadian phase
- Sleep, medical disorders



Myths we tell ourselves

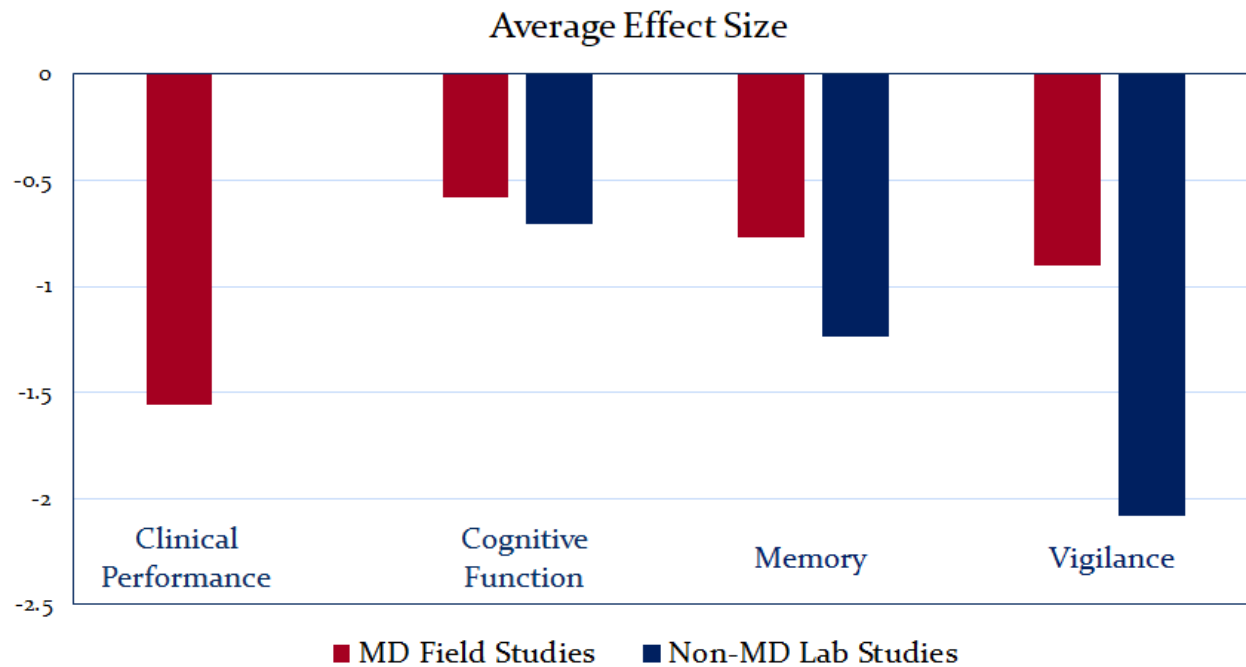
- I'm one of those people who don't need much sleep
- You can adapt to being sleep-deprived
- It's better to "power through" call than to nap
- A night of recovery sleep gets you back to baseline
- The practice of medicine is fundamentally different from other professions
- Doctors are fundamentally different from other professionals

Sleep duration in adults:
NHANES 2005-2008



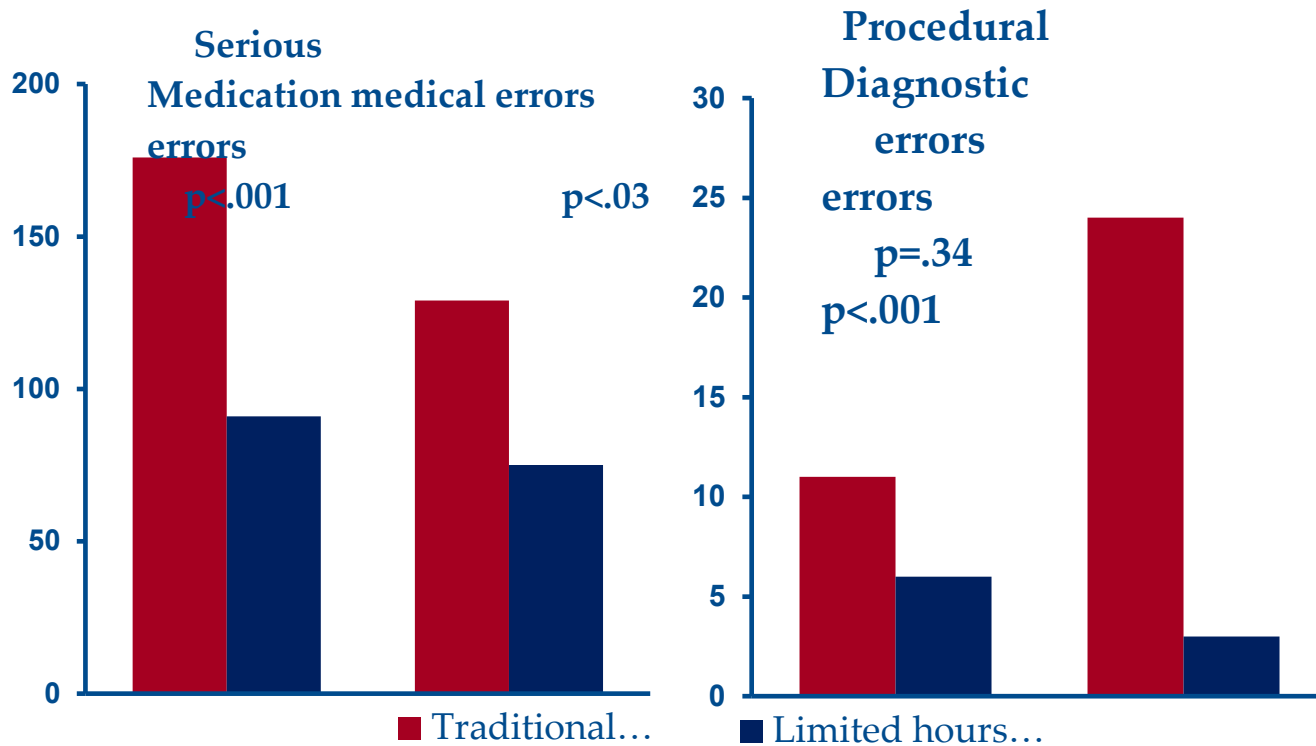
Weighted population estimates based on n = 10,896 U.S. adults >20 y.o.

Meta-analysis on sleep loss and performance in residents and non-physicians



N = 60 studies; n=20 MD, n=40 non-MD

Effect of traditional and limited work schedules on medical errors in interns



Landrigan, *NEJM* 2004; 351:1838-48

Sleepiness is underestimated

Anesthesia study (Howard, 2002)

- The residents did not perceive themselves to be asleep ~50% of times they **had actually fallen asleep**
- The residents were wrong 76% of the time they reported having stayed awake



Recognizing sleepiness



Since sleepy people **underestimate** their level of sleepiness and **overestimate** their alertness, BEHAVIOR is a much better indicator of sleepiness:

- moodiness
- irritability
- impoverished speech or flat affect
- impaired problem solving
- sedentary nodding off
- medical errors
- micro-sleeps (5-10 second lapses in attention)
- repeatedly checking work
- difficulty focusing on tasks

Managing Sleepiness: Naps

- Preventative (pre-call) vs. Operational (on the job)
- Duration
 - Short naps: ≤ 30 minutes (avoid sleep inertia)
 - Long naps: 30 to 180 minutes (more restorative)
- Timing: Circadian peaks in sleepiness: 0200-0500, 1400-1700
- Pros: Some sleep is (almost) always better than no sleep
- Cons: Sleep inertia and need adequate recovery time (15-30 minutes)
- Take-Home: Naps help, but *do not replace* adequate night sleep

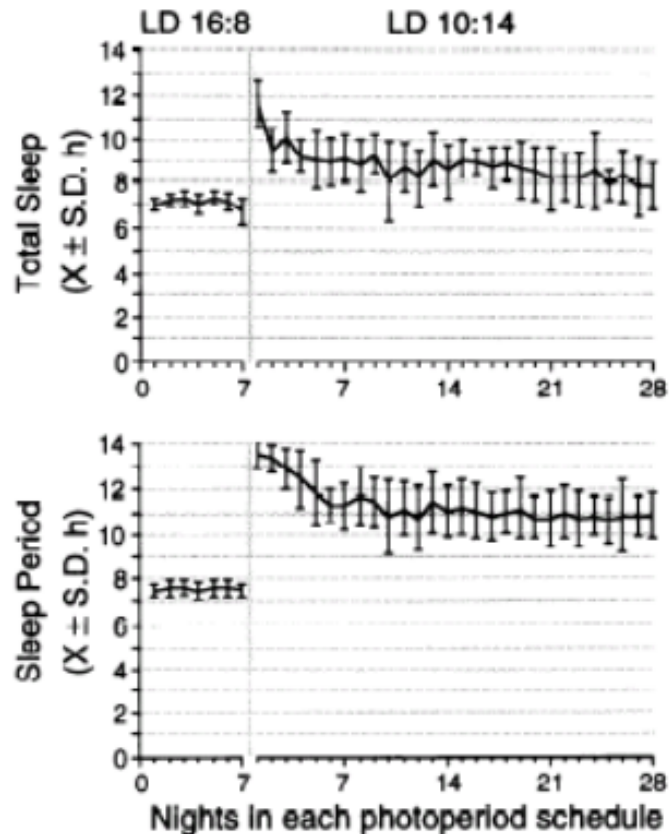


Managing Sleepiness: Healthy Sleep Habits

- Get adequate duration of sleep (7 to 9 hours) *before* anticipated sleep loss
 - Avoid *starting out* with a sleep deficit
 - Cumulative sleep duration and sleep loss are important
- Maintain regular sleep-wake hours and routines
- Appropriate timing (centered on 3:00 AM)
- Protect and prioritize sleep time
 - Enlist family and friends
 - Minimize interruptions
- Exercise and engage in enjoyable activities



Laboratory study of sleep in 8 and 14 hours of darkness



Wehr, *Am J Physiol* 1993; R846-57

Managing sleepiness: Recovery from sleep loss

- Chronic sleep restriction compounds the effects of acute sleep loss
- Recovery from chronic sleep loss does not happen overnight
- 2-10 nights of extended sleep to achieve maximal alertness

Managing Sleepiness: Drugs



■ HYPNOTICS

- In certain situations, physicians may benefit from talking to their physician about prescribed medications and/or over the counter agents to help manage sleep-related issues

■ ALCOHOL

- Be aware that while alcohol can induce sleep, it is ill-advised as it can disrupt sleep later on

■ CAFFEINE

- Targeted use of caffeine can improve alertness, but beware because it has a relatively long half-life, and so it is advised to discontinue at least 8 hours prior to planned sleep



Managing Sleepiness: Night Shift

- Protect your sleep
- Ensure optimal sleep environment
- Nap before work
- Consider “splitting” daytime sleep into two shorter periods
- Get bright light when you need to be alert during night shift (especially first half)
- Avoid light exposure in the morning after night shift
- Consider using Melatonin for morning sleep

Changes in medical errors after implementing a systematic hand-off program

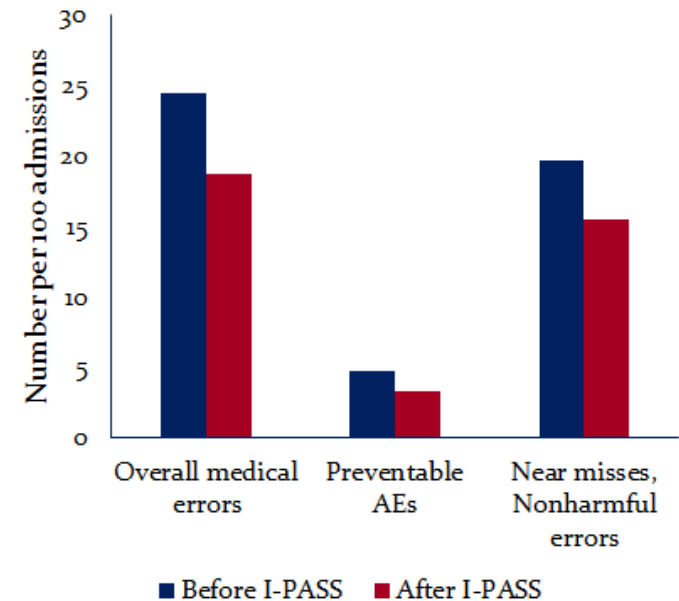
9-Hospital Intervention

- Mnemonic to standardize written, oral hand-offs
- Handoff and communication training
- Faculty development
- Sustainability

Study Outcomes

- Medical errors ↓ 23%
- Preventable AEs ↓ 30%
- Near misses ↓ 21%

Medical Errors Before and After I-PASS Bundle
($p < .001$ for each)





Scenario #3

Scenario #3

- A 30-year-old female medical student just started her family medicine rotation as a third year in your family practice. She is a single mother with a one-year-old daughter. She has no family or close supports living nearby and she moved to the clinical rotation site just two weeks before the start of her rotations. During her first three rotations, her preceptors noticed she frequently arrives to work late and requests to leave half an hour early to pick up her child from daycare. As family practice preceptor, you contact the medical school to discuss with the rotation chair. The rotation chair explains her situation and advises *you* talk to the student about any concerns you have about professionalism regarding work expectations as a clinical medical student.

Discussion

- As a preceptor, how would you approach this situation?
- What are the risk factors for fatigue and burnout in this case?
- What actions can be helpful for monitoring and screening for fatigue in this scenario?
- What supports and resources might be available to support this medical student?



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Fatigue due to work-life balance

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Burnout, depression, substance abuse

- VI.C.1.e) attention to resident and faculty member burnout, depression, and substance abuse. The program...must educate faculty members and residents in identification of the symptoms of burnout, depression, and substance abuse, including means to assist those who experience these conditions. Residents and faculty members must also be educated to recognize those symptoms in themselves and how to seek appropriate care.



LMU Student Support Program: Empathia

- Telephonic, video, chat* and face-to-face counseling
- Computerized Cognitive Behavioral Therapy (cCBT)
- Financial counseling and financial aid support
- Substance abuse prevention and counseling
- *24/7 crisis support and intervention
- Resources to help navigate school/life issues
- Critical incident response and management
- Resources and assistance for students studying abroad
- Support for dependents/family members



Refer to:

- <https://www.empathia.com/student-support-programs/>
- Rick Slaven
- ricky.slaven@lmunet.edu

Director of Students and Academic
Advancement

423-869-6453

Fatigue – Online Screening Tools

The Fatigue Severity Scale (FSS)

- <https://www.onlineassessmenttool.com/fatigue-severity-scale-fss-of-sleepdisorders/assessment-53375>
- The Fatigue Severity Scale (Krupp, LaRocca, Muir-Nash, & Steinberg, 1989) is a 9-item questionnaire to determine the impact of fatigue based on self-report over the past week.

Epworth Sleepiness Scale

- <https://www.cdc.gov/niosh/work-hour-training-for-nurses/02/epworth.pdf>
- The Epworth Sleepiness Scale (ESS) is a scale intended to measure daytime sleepiness that is measured by use of a very short questionnaire. This can be helpful in diagnosing sleep disorders. It was introduced in 1991 by Dr Murray Johns of Epworth Hospital in Melbourne, Au

Thank you for
your time and for
precepting our
students!!!

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Resources

1. Buysee, D. (2020). Sleep in Medical Education [PowerPoint presentation]. WELL Toolkit 2020. <https://gmewellness.upmc.com/Resources/Index?topicID=3> Slides adapted/copied with permission of author.
2. <https://osteopathic.org/wp-content/uploads/COCA-2023-COM-Continuing-Standards.pdf>
3. <https://www.acgme.org/programs-and-institutions/programs/common-program-requirements/>