

HOW TO RECOGNIZE SLEEP DEPRIVATION AND FATIGUE

Sleep deprivation and fatigue interfere with concentration, cognition, fine motor tasks, decision making, and emotional stability. It can impact your ability to safely care for patients and can compromise your own safety and wellbeing – particularly when it comes to driving while drowsy and your mental and emotional health.

The Office of GME and your individual programs recognize that adequate sleep and restoration are needed for optimal performance. We strongly emphasize the honest and accurate reporting of duty hours so that programs can help prevent fatigue and burnout.

CAUSES

- 6 hours or less of sleep per night
- Work overload and/or shift work
- Jet lag
- Illness
- Depression, anxiety, and stress
- Medication side effects
- New baby, puppy, or disruption in home environment (inability to complete full sleep cycles)
- Sleep apnea, snoring (self or others), and other sleep disorders

SIGNS

- Difficulty keeping eyes open
- Nodding off and/or yawning repeatedly
- Slowed cognitive processes and reaction times
- Emotional changes including irritability, anger, or tearfulness
- Difficulty managing emotions

SIGNS WHILE DRIVING

ALL OF THE ABOVE, PLUS:

- Trouble focusing on the road
- Drifting lanes and/or missing exits
- Unable to remember driving the past few miles
- Closing eyes at traffic lights

WHAT TO DO WHEN YOU'RE DROWSY AND NEED TO WORK OR DRIVE

TALK TO YOUR ATTENDING/SUPERVISING FACULTY MEMBER.

Your faculty were once trainees themselves and have likely experienced significant fatigue at some point in their careers. Have an honest conversation with them about your concerns, particularly if you believe your ability to safely care for patients is compromised.

STRATEGIC NAPPING IN CALL ROOMS.

Darken the room as much as possible and limit your use of electronic devices (to the degree that patient care is not compromised). Set an alarm for your desired wake-up time. While needs will vary by individual, nap lengths should generally be kept to under 30 minutes (before going into deep sleep) or at about 90 minutes (average length of a sleep cycle). Thoughtful timing of naps may help you avoid sleep inertia and grogginess by awakening during light stages of sleep. If possible, try not to nap too close to a planned extended sleep period.

DRINK A CAFFEINATED BEVERAGE.

Strategic use of caffeine involves ingestion at times that will promote alertness and performance during periods of vulnerability. A significant alertness boost can be obtained from 200 mg of caffeine (two 8 oz. cups of coffee) with positive effects at doses as low as 100 mg. Caffeine reaches peak concentrations in the bloodstream 30-60 minutes after consumption. While it has its benefits, too much caffeine can induce sleeplessness, irritability, and anxiety. You should not rely on caffeine as a substitute for sleep!

WHEN POST-CALL, TAKE A 20-MINUTE NAP BEFORE LEAVING FOR HOME.

Wear dark or amber-tinted sunglasses when outside or driving. You may also want to strategically time caffeine consumption in the last half of your shift so that it enables you to safely drive without impacting your extended sleep period once you arrive at home.

FIND AN ALTERNATIVE TO DRIVING.

Call a friend or family member to pick you up, or take a taxi or rideshare service (Uber, etc.). WU/BJH/SLCH GME will [reimburse](#) a one-way ride home from the hospital(s) or clinic.

IF ALREADY DRIVING AND YOU NOTICE SIGNS OF SLEEPINESS

Pull over at a safe spot and take a short nap or contact a friend to pick you up.

PRACTICING HEALTHY SLEEP HABITS

It goes without saying that resident and fellow work hours can be long and unpredictable, and it can be challenging to prioritize your sleep when there are so many demands on your time. However, whenever possible, the following strategies are recommended to support healthy sleep habits.

DEVELOP A BEDTIME ROUTINE.



When possible, go to bed and get up at the same time each day. Find a pre-sleep routine that helps you to relax and prepare your body and brain for sleep, such as reading, stretching, or meditation.

AIM FOR AT LEAST 7 HOURS OF PROTECTED SLEEP TIME.



Most adults have a genetically hardwired sleep requirement for optimal functioning that ranges from 7-9 hours. When sleep requirements are not met, a sleep debt ensues that must be paid off.

CREATE A SLEEP-FRIENDLY ENVIRONMENT.



Keep your bedroom cool and dark. If needed, use earplugs, a fan or white noise machine, and an eye mask or blackout curtains to reduce light and noise. Talk with the people you live with about the ways they can help to protect your sleep and avoid sleep disruptions.

LIMIT CERTAIN ACTIVITIES BEFORE BEDTIME.



Stop using electronics - including your mobile phone, computers, or TV - at least an hour before lights out. Avoid intense exercise and consuming alcohol at least 2 hours before bedtime, and never use alcohol as a sleep aid.

APPROACHING A SLEEP-DEPRIVED COLLEAGUE

The sleeper you are, the less accurate your perception of your degree of impairment. Studies have shown that sleepy people underestimate their level of sleepiness and overestimate their alertness. At WU/BJH/SLCH we aim to create a culture of safety and interdependence in which residents and faculty can raise concerns about sleep deprivation and fatigue without fear of judgment or retaliation.

When approaching an impaired colleague, be honest with the affected person about your concerns. Let them know what you have observed and that you care about their wellbeing and their ability to safely care for patients. You can suggest the appropriate fatigue mitigation strategies outlined on the previous page.

If needed, inform the supervising faculty, Chief, Program Director, or Director of GME Wellness about your concerns. IF the issue is chronic, suggest that they contact their primary care provider and/or make an appointment with the [GME Counseling](#) for further support.

RESOURCE AND CONTACTS

GME WELLNESS COUNSELING

Residents and fellows can be seen free of charge by GME Counselors to discuss sources of stress, burnout, and fatigue. The counselors have extended hours in the evenings Mon-Thurs. Appointments can be [scheduled online](#).

TAXI AND RIDESHARE REIMBURSEMENT

GME will reimburse a ride home and return service to the hospital/clinic for any resident or fellow experiencing fatigue. Submit a completed [reimbursement form](#) and receipt to the GME Office Manager: gme@wustl.edu

EMPLOYEE ASSISTANCE PROGRAM

Residents and fellows and their family members have access through either the WU or BJC Employee Assistance Program (EAP), including mental health resources and assistance with finding household or personal services.

FOR ADDITIONAL INFORMATION OR SUPPORT WITH SLEEP AND FATIGUE MANAGEMENT, CONTACT:

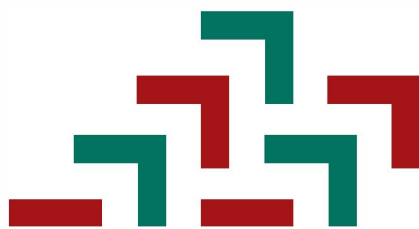
Jenny Duncan, M.D.
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BJC Employee Assistance Program: 314-747-7490
WU Employee Assistance Program: 844-365-4587

[Signs of a Sleep Problem handout](#) on GME Website: gme.wustl.edu/wellness

SOURCES:

American Academy of Sleep Medicine's SAFER Presentation: *Sleep and Fatigue Education in Residency*
Centers for Disease Control and Prevention
Peel, J. *Resident Sleep and Fatigue presentation*, UT Health San Antonio
SleepEducation.org
SleepFoundation.org



Nutritional Strategies to Mitigate Fatigue in Physicians

By Maryam Makowski, PhD

Some of the negative effects of sleep deprivation due to shiftwork or long work hours can be mitigated by deliberate modifications in hydration and nutrition. Below are some strategies you might find helpful.

1. Hydration strategies

- a. Use your urine color as a way of gauging your hydration status (lemonade color: hydrated, apple juice color or darker: need to drink more fluids).
- b. In order to overcome dehydration without frequent restroom visits:
 - i. When possible, drink small amounts of fluids throughout the day.
 - ii. Consider fruit and vegetables as time-release fluids that support hydration status by gradually releasing water during the digestion process.
- c. Despite containing caffeine, up to 3 cups of coffee and 5 cups of tea per day count towards daily fluid intake requirements.
- d. Aim for *at least* 6 glasses (1.5 liters) of plain water a day. To achieve this consider drinking a cup of water upon waking up, with every meal or snack, on your commute to and from work, or during meetings.

2. Caffeine consumption strategies

- a. Given that caffeine can take up to 30 to 60 minutes to reach its peak alerting effects, you can drink coffee or tea right before taking a short nap (caff-nap) and benefit from the combined alerting effects of caffeine and nap and reduced grogginess after taking a nap.
- b. Coffee is a better choice, compared to tea, for tasks that involve physical activity, attention-switching, and short-term alertness, whereas tea, in particular green tea, is a better choice for tasks that require concentration and sustained attention.

3. Meal timing and composition strategies

- a. When you are sleep-deprived, for example on post-call days, eat a protein-rich meal shortly after waking to help with alertness during the day, and a carbohydrate-rich meal at least 4 hours before bedtime to help with better sleep at nighttime.
- b. When possible, avoid eating within 4 hours of sleep. If you need to eat within 4 hours of sleeping, opt for a light and easy-to-digest meal or snack.
- c. Avoid caffeinated products, chocolate, alcohol, and heavy and spicy meals 4 hours before bedtime.
- d. Green leafy vegetables, berries, cherries or grapes, unsalted raw or dry-roasted nuts and seeds contain many nutrients essential for mental health and sleep quality. Aim for at least one serving of each per day.
- e. When you are sleep deprived, eating a meal with high protein content and low carbohydrate and fat contents can reduce postprandial sleepiness.
- f. Limit foods with added sugar and saturated fat, as regular consumption of foods high in fat or sugar exacerbate fatigue levels and impair your alertness, cognitive performance, and sleep quality.
- g. During night shifts:
 - i. Drink at least 500 ml of water to reduce fatigue and improve your energy levels and mood.
 - ii. Avoid eating meals during the time you are normally sleeping. For example, if you normally sleep between 10 pm and 6 am, consume two meals before 10 pm, one after waking up after your recovery sleep and one before or at the beginning of your nightshift, avoid eating meals between 10 pm and 6 am (a small healthy snack is OK) and eat your third meal after 6 am, ideally 3 hours prior to your recovery sleep.
 - iii. Consuming tea or coffee at the beginning of your night shifts can help with increasing your core body temperature in the middle of the night and reducing sleepiness. Avoid caffeine closer to the end of your shift as it can interfere with your recovery sleep.
 - iv. Drink warm liquids (herbal tea, soup, hot water) to increase your core body temperature when you feel cold and tired in the middle of the night.
 - v. Chew chewing gum to improve alertness, mental focus, and reduce stress.

References:

- 1) Hamidi (Makowski) MS, Boggild MK, Cheung AM. Running on empty: a review of nutrition and physicians' well-being. *Postgrad Med J.* 2016 Aug;92(1090):478-81.
- 2) Hamidi (Makowski) MS, Nutrition for Optimal Physician Performance and Wellbeing. In *The Art and Science of Physician Wellbeing: A Handbook for Physicians and Trainees*, Edited by Roberts LW, Trockel M, Springer International Publishing, 1st ed, 2019, pp 235-254.
- 3) Makowski MS, Shanafelt TD, Hausel A, Bohman BD, Roberts R, Trockel MT. Associations Between Dietary Patterns and Sleep-Related Impairment in a Cohort of Community Physicians: A Cross-sectional Study. *Am J Lifestyle Med.* 2019 Sep 10;15(6):644-652.
- 4) Makowski MS, Trockel MT, Menon NK, Wang H, Katznelson L, Shanafelt TD. Performance Nutrition for Physician Trainees Working Overnight Shifts: A Randomized Controlled Trial. *Acad Med.* 2022 Mar 1;97(3):426-435.

Performance Nutrition Recommendations for Physician Trainees Working Overnight Shifts

Recommendation	Rationale ^a	Tactics to foster implementation
Keep hydrated	In addition to findings of this study, there is convincing evidence that being hydrated is associated with improved mood, cognitive performance, and alertness and reduced sleepiness. ^{23,25,26,72-74}	<p>Individuals:</p> <ul style="list-style-type: none"> • Drink water, tea, and coffee during a night shift to fulfill daily fluid intake requirements.⁷⁵ • Aim for at least 3 and ideally 6 glasses of plain water a day.⁷⁶ That said, individual water requirements vary and the simplest way to assess hydration status is to use urine color chart developed and validated by Armstrong et al.^{77,78} • To overcome dehydration while regulating frequent visits to restrooms, drink small amounts of fluids frequently throughout the shift. During the day, consume fruits and vegetables, which contain fluid that is gradually released. <p>Organizations:</p> <ul style="list-style-type: none"> • Ensure the number and locations of water fountains meet physician trainees' needs. • Provide free and portable water bottles at mealtimes as an alternative to sugar-sweetened beverages. • Provide education on importance of hydration on work performance.
Pay attention to meal timing	There is convincing evidence that, compared with the morning, eating late at night or during night shifts results in unfavorable cognitive performance, metabolic response, and energy expenditure. ^{12,13,21,79-84} The negative effect on metabolism is observed as early as eating at 8 PM. ⁸²	<p>Individuals:</p> <ul style="list-style-type: none"> • During overnight shifts, eat meals before start of the night shift and before 10 PM. <p>Organizations:</p> <ul style="list-style-type: none"> • Provide physician trainees healthy meals at the beginning of each overnight shift. • Provide education that eating meals during overnight shifts may impair work performance.
Pay attention to meal size and composition	Many studies have shown that the size of the meal, fat content, and carbohydrate-to-protein ratio in meals can acutely affect postprandial cognitive performance. ^{15-17,85} Large meals that are low in protein and high in both fat and carbohydrates may slow down reaction times and result in higher self-reported fatigue and sleepiness. ^{15,16,19,35-38,86-92}	<p>Individuals:</p> <ul style="list-style-type: none"> • During night shifts, choose dinners with higher protein and lower carbohydrate and fat contents. One suggestion for a balanced meal is to include 20–30 g of protein, 40–60 g of complex carbohydrates, and 20–30 g of fat with less than 7 g of saturated fat and no added sugars. • After completing the shift, consuming a meal with higher carbohydrate content 2–4 hours before bedtime may shorten sleep onset latency. • Limit consumption of drinks and foods with added sugar and saturated fat. <p>Organizations:</p> <ul style="list-style-type: none"> • Improve access to free or affordable fruits, vegetables, protein sources (low in saturated fat), and whole grains. • Limit access to sugar-sweetened beverages, foods, and snacks high in added sugar and saturated fat. • Provide education about the importance of meal size and composition on work performance.

^aThese recommendations could also be considered as part of residency program efforts to adhere to the Accreditation Council for Graduate Medical Education Common Program Requirement to mitigate fatigue.³²

Performance Nutrition for Physician Trainees Working Overnight Shifts: A Randomized Controlled Trial

Makowski, Maryam S.; Trockel, Mickey T.; Menon, Nikitha K.; Wang, Hanhan; Katznelson, Laurence; Shanafelt, Tait D. *Academic Medicine* 97(3):426-435, March 2022.