

LEEP, ALERTNESS, and FATIGUE **EDUCATION** in RESIDENCY

Learning Objectives

- 1. List factors that put you at risk for sleepiness and fatigue.
- 2. Describe the impact of sleep loss on residents' personal and professional lives.
- 3. Recognize signs of sleepiness and fatigue in yourself and others.
- 4. Challenge common misconceptions among physicians about sleep and sleep loss.
- 5. Adapt alertness management tools and strategies for yourself and your program.

The problem of sleepiness and fatigue in residency is underestimated.

Epworth Sleepiness Scale

- How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you.
- Use the following scale to choose the most appropriate number for each situation: o = no chance of dozing 1 = slight chance of dozing 2 = moderate chance of dozing 3 = high chance of dozing
- Sitting and reading
- Watching TV
- Sitting inactive in a public place (e.g. a theater or a meeting)
- As a passenger in a car for an hour without a break
- Lying down to rest in the afternoon when circumstances permit
- Sitting and talking to someone
- Sitting quietly after a lunch without alcohol
- In a car, while stopped for a few minutes in traffic

Epworth Sleepiness Scale



Sleepiness in residents is equivalent to that found in patients with serious sleep disorders. Mustafa and Strohl, unpublished data. Papp, 2002

Nhy So?

- Physicians know relatively little about sleep needs and sleep physiology.
- •Most programs do not recognize and address the problem of resident sleepiness.
- The culture of medicine says:
 - "Sleep is 'optional' (and you're a wimp if you need it)"
 - "Less sleep = more dedicated doc"



Myth: "It's the really boring noon conferences that put me to sleep."

Fact: Environmental factors (passive learning situation, room temperature, low light level, etc) may unmask but **DO NOT CAUSE SLEEPINESS.**

Conceptual Framework (in Residency)

Insufficient Sleep (on call sleep loss/inadequate recovery sleep)

Fragmented Sleep (pager, phone calls)

EXCESSIVE DAYTIME SLEEPINESS

Circadian Rhythm Disruption (night float, rotating shifts)

Primary Sleep Disorders (sleep apnea, etc)



Sleep Needed vs. Sleep Obtained

- Myth: "I'm one of those people who only need 5 hours of sleep, so none of this applies to me."
- Fact: Individuals may vary somewhat in their tolerance to the effects of sleep loss, but are not able to accurately judge this themselves.
- Fact: Human beings need 7 to 8 hours of sleep to perform at an optimal level.
- Fact: Getting less than 7-8 hours of sleep starts to create a "sleep debt".

Why is sleep necessary?

- Repair and restoration theory
 NREM sleep: physiological functions
 REM sleep: mental functions
- Evolutionary or adaptive theory
 - Conservation of energy
 - Sleep as a hazardous activity
- Information consolidation theory
 - Processing information
 - Building long-term memory

How much sleep do we need?



Kripke et al. Archives of General Psychiatry, 2002



Sleep Fragmentation Affects Sleep Quality



Sleep Disorders: Are you at risk?

Physicians can have sleep disorders too!
-- Obstructive sleep apnea
-- Restless legs syndrome
-- Learned or "conditioned" insomnia
-- Medication-induced insomnia or hypersomnia
-- Narcolepsy

Adaptation to Sleep Loss

Myth: "I've learned not to need as much sleep during my residency."

Fact: Sleep needs are genetically determined and cannot be changed.

Fact: Human beings do not "adapt" to getting less sleep than they need.

Fact: Although performance of tasks may improve somewhat with effort, *optimal* performance and *consistency* of performance do not!

Consequences of Chronic Sleep Deprivation

Sleep is a vital and necessary function, and sleep needs (like hunger and thirst) must be met.





Surgery: 20% more errors and 14% more time required to perform simulated laparoscopy post-call (two studies) Taffinder et al, 1998; Grantcharov et al, 2001

• Internal Medicine: efficiency and accuracy of ECG interpretation impaired in sleep-deprived interns Lingenfelser et al, 1994

 Pediatrics: time required to place an intra-arterial line increased significantly in sleep-deprived residents Storer et al, 1989
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Impact on Professionalism

"Your own patients have become the enemy...because they are the one thing that stands between you and a few hours of sleep."

Work Hours, Medical Errors, and Workplace Conflicts by Average Daily Hours of Sleep*



Adverse Health Consequences by Average Daily Hours of Sleep*



Sleep Loss and Fatigue: Safety Issues

58% of emergency medicine residents reported near-crashes driving.

 80% post night-shift
 Increased with number of night shifts/month Steele et al 1999

 50% greater risk of blood-borne pathogen exposure incidents (needlestick, laceration, etc) in

residents between 10pm and 6am. Parks 2000

mpact on Medical Errors

 Surveys: more than 60 % of anesthesiologists report making fatigue-related errors.
 Gravenstein 1990

Case Reviews:

- 3% of anesthesia incidents
- 5% "preventable incidents"
- 10% drug errors Williamson 1993
- Post-op surgical complication rates 45%, higher if resident was post-call Haynes et al 1995

Morris 2000

"fatigue-related"

Recognizing Sleepiness in Yourself and Others



•Myth: "If I can just get through the night (on call), I'm fine in the morning."

•Fact: A decline in performance starts after about 15-16 hours of continued wakefulness.

•Fact: The period of lowest alertness after being up all night is between 6am and 11am (eg, morning rounds).

Estimating Sleepiness

Myth: "I can tell how tired I am and I know when I'm not functioning up to par."
Fact: Studies show that sleepy people underestimate their level of sleepiness and overestimate their alertness.

Fact: The sleepier you are, the *less accurate* your perception of degree of impairment.Fact: You can fall asleep briefly ("microsleeps") without knowing it!

Recognize The Warning Signs of Sleepiness

- Falling asleep in conferences or on rounds
- Feeling restless and irritable with staff, colleagues, family, and friends
- Having to check your work repeatedly
- Having difficulty focusing on the care of your patients
- Feeling like you really just don't care

Alertness Management Strategies



Vapping

Pros: Naps temporarily improve alertness. **Types:** preventative (pre-call) operational (on the job) Length: short naps: no longer than 30 minutes to avoid grogginess ("sleep inertia") that occurs when awakened from deep sleep long naps: 2 hours (range 30 to 180 minutes)

Napping

Timing:

-- if possible, take advantage of circadian "windows of opportunity" (2-5 am and 2-5 pm);
-- but if not, nap whenever you can!
Cons: sleep inertia; allow adequate recovery time (15-30 minutes)
Bottom line: Naps take the edge off but *do not replace* adequate sleep.

Healthy Sleep Habits

Get adequate (7 to 9 hours) sleep before anticipated sleep loss. Avoid starting out with a sleep deficit!

Recovery from Sleep Loss

Myth: "All I need is my usual 5 to 6 hours the night after call and I'm fine." Fact: Recovery from on-call sleep loss generally takes 2 nights of extended sleep to restore baseline alertness. Recovery sleep generally has a higher percentage of deep sleep, which is needed to counteract the effects of sleep loss.

Healthy Sleep Habits

- Go to bed and get up at about the same time every day.
- Develop a pre-sleep routine.
- Use relaxation to help you fall asleep.
- Protect your sleep time; enlist your family and friends!

Healthy Sleep Habits

- Sleeping environment:
 - Cooler temperature
 - Dark (eye shades, room darkening shades)
 - Quiet (unplug phone, turn off pager, use ear plugs, white noise machine)
- Avoid going to bed hungry, but no heavy meals within 3 hours of sleep.
- Get regular exercise but avoid heavy exercise within 3 hours of sleep.

Recognize Signs of DWD *

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

* Driving While Drowsy

Drugs

- Melatonin: little good data
- Hypnotics: may be helpful in specific situations (e.g., persistent insomnia)
- AVOID: using stimulants (methylphenidate, dextroamphetamine, modafinil) to stay awake
- AVOID: using alcohol to help you fall asleep; it induces sleep onset but disrupts sleep later on

Caffeine

- Strategic consumption is key
- Effects within 15 30 minutes; half-life 3 to 7 hours
- Use for temporary relief of sleepiness
- Cons:
 - disrupts subsequent sleep (more arousals)
 - tolerance may develop
 - diuretic effects

Adapting To Night Shifts

- Myth: "I get used to night shifts right away; no problem."
- Fact: It takes at least a week for circadian rhythms and sleep patterns to adjust.
- Fact: Adjustment often includes physical and mental symptoms (think jet lag).
- Fact: Direction of shift rotation affects adaptation (forward/clockwise easier to adapt).

Summary...

- Fatigue is an impairment like alcohol or drugs.
- Drowsiness, sleepiness, and fatigue cannot be eliminated in residency, but can be managed.
- Recognition of sleepiness and fatigue and use of alertness management strategies are simple ways to help combat sleepiness in residency.
- When sleepiness interferes with your performance or health, talk to your chief resident, program directors or faculty mentor.