

**SLEEP-THE MOST BEAUTIFUL
EXPERIENCE IN LIFE**



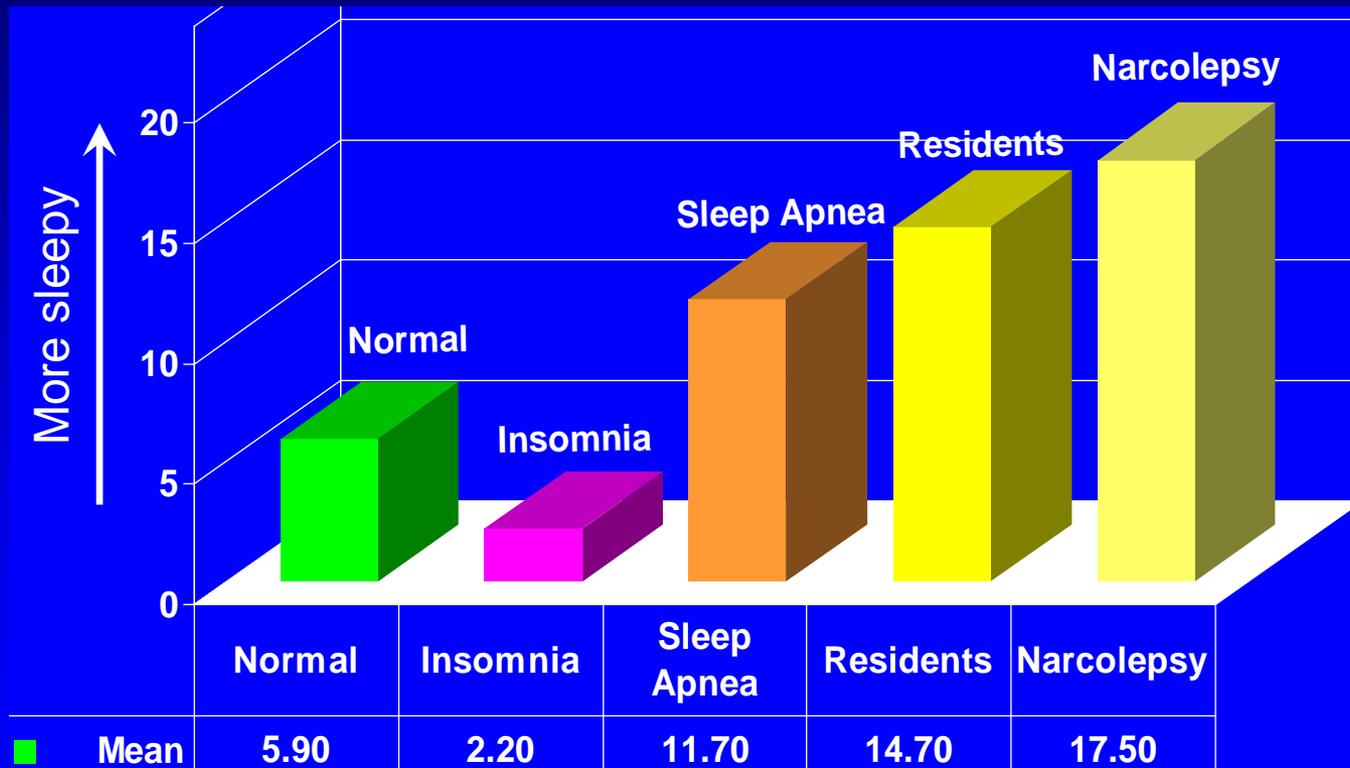
Objectives

- List factors that put you at risk for sleepiness and fatigue
- Recognize signs of sleepiness and fatigue in yourself and others.
- Adapt alertness management tools and strategies for yourself

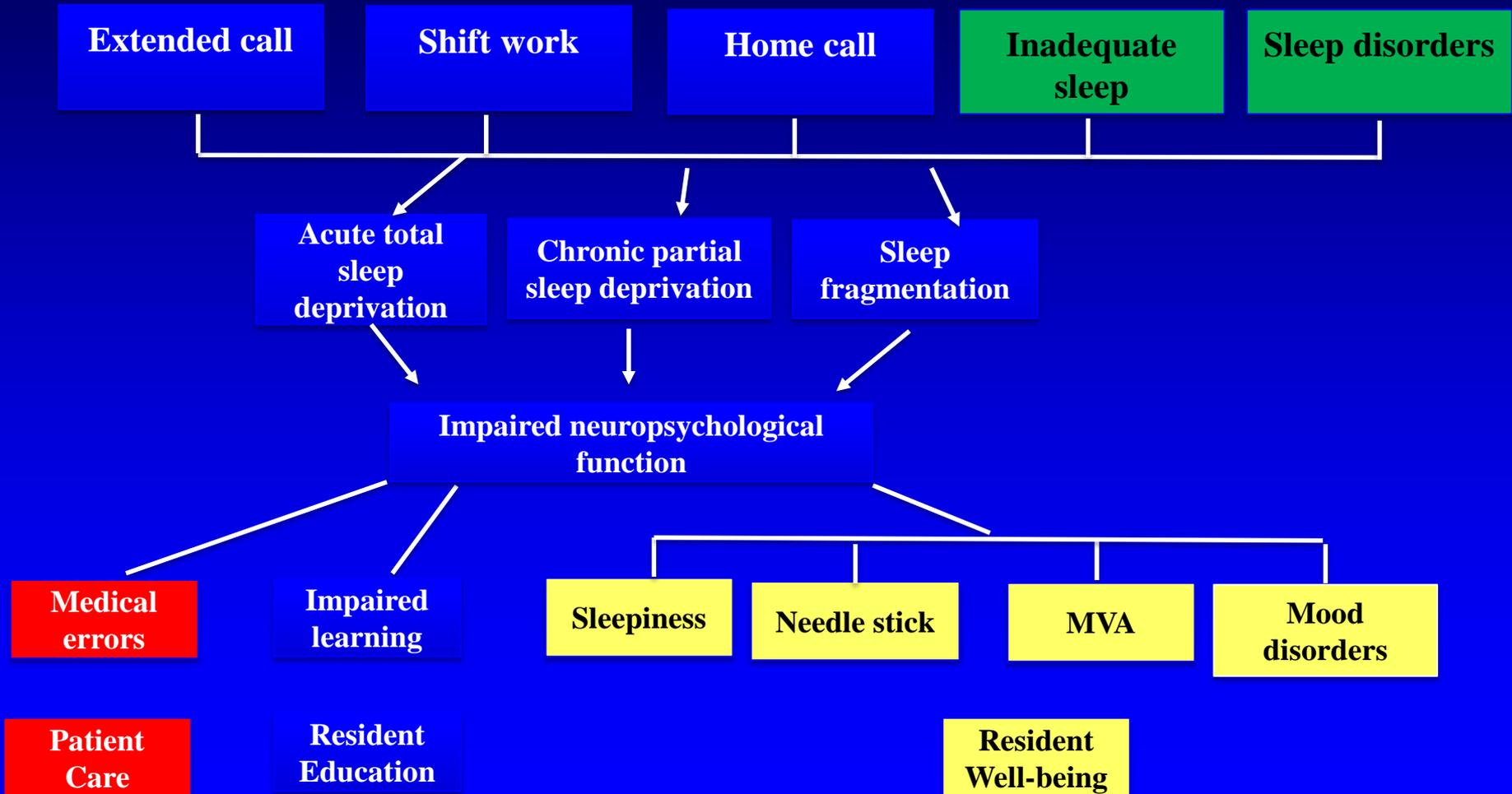
National Sleep Foundation: Average recommended nightly hours of sleep

7-9 hrs/night!

Post-call residents are as sleepy as patients with narcolepsy or sleep apnea



Effects of sleep disturbance during training



Negative effects of experimental sleep deprivation

- Neurobehavioral performance
 - Sustained attention
 - Reaction time
 - Vigilance
- Cognitive performance
 - Memory
 - Reasoning
 - Problem solving

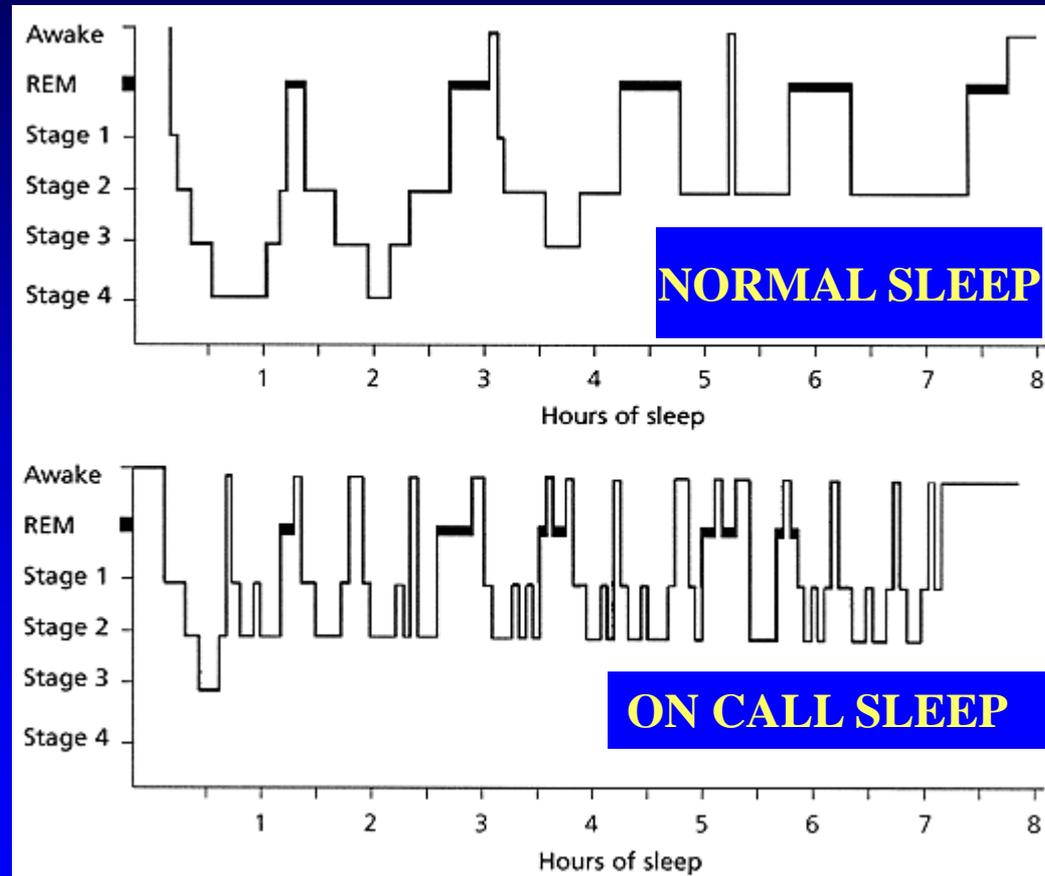
What causes sleepiness?

Common beliefs:

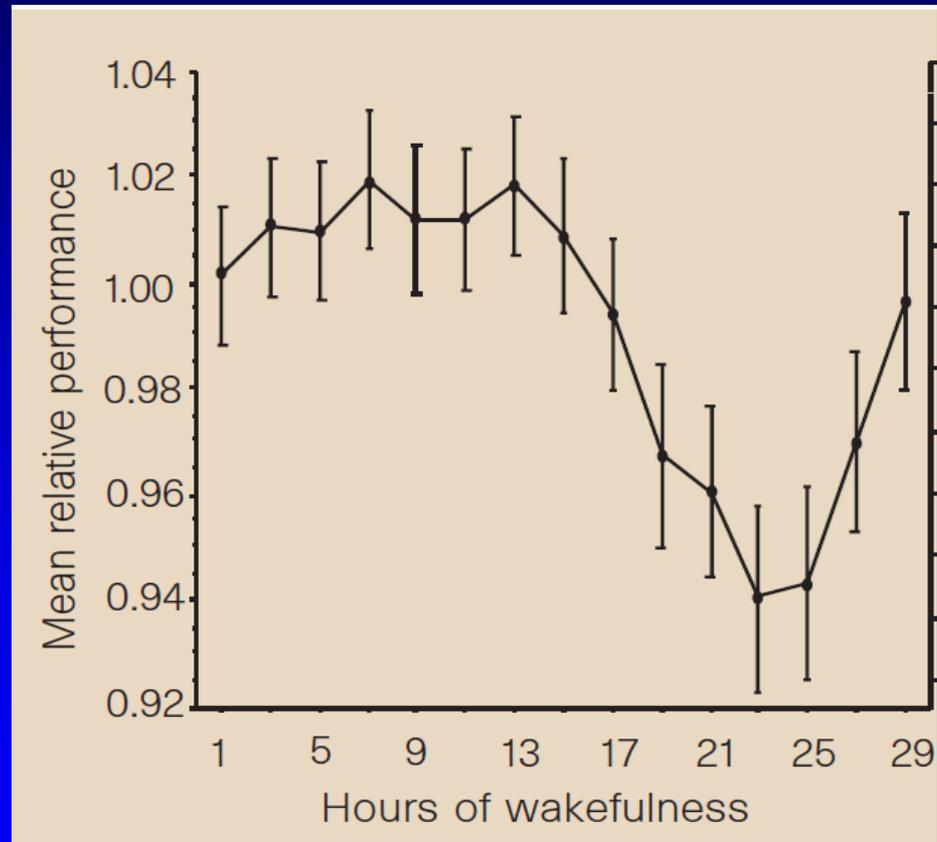
- It's the boring noon conferences
- It's the room- it's too:
 - Dark
 - Warm
 - Cool
- It's the food
 - Too much carbohydrates
 - Too much sugar



Sleep Restriction and fragmentation result in sleepiness



Performance deteriorates after 16 hours of wakefulness



Dawson, D et al. *Nature* 1997

Consequences of Chronic Sleep Deprivation

- Effects on YOU
- Effects on PATIENTS

Effects on YOU

- CAR ACCIDENTS

- Pediatric house staff (q 4 call)

- 25% reported crashes
- 23% reported having fallen asleep while driving
- 44% had fallen asleep while stopped at a red light (100% after call)

- Interns

- Odds ratio for reporting MVA was 2.3 and for near miss MVA was 5.9 postcall
- Every extended work shift/month increased risk of crash during commute from work by 16%
- During months with 5 or more shifts, the risk of falling asleep while driving or stopped in traffic increased (OR 2.3)



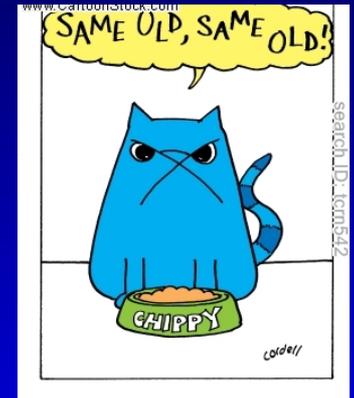
Effects on YOU

- NEEDLE STICKS
 - More needlesticks during extended shifts (OR 1.6)
 - 50% increase in blood borne pathogen exposures between 10pm and 6 am

Effects on YOU

- MOOD

- Anger, tension, irritability, fatigue, anxiety, emotional reactivity, burnout
- Depression



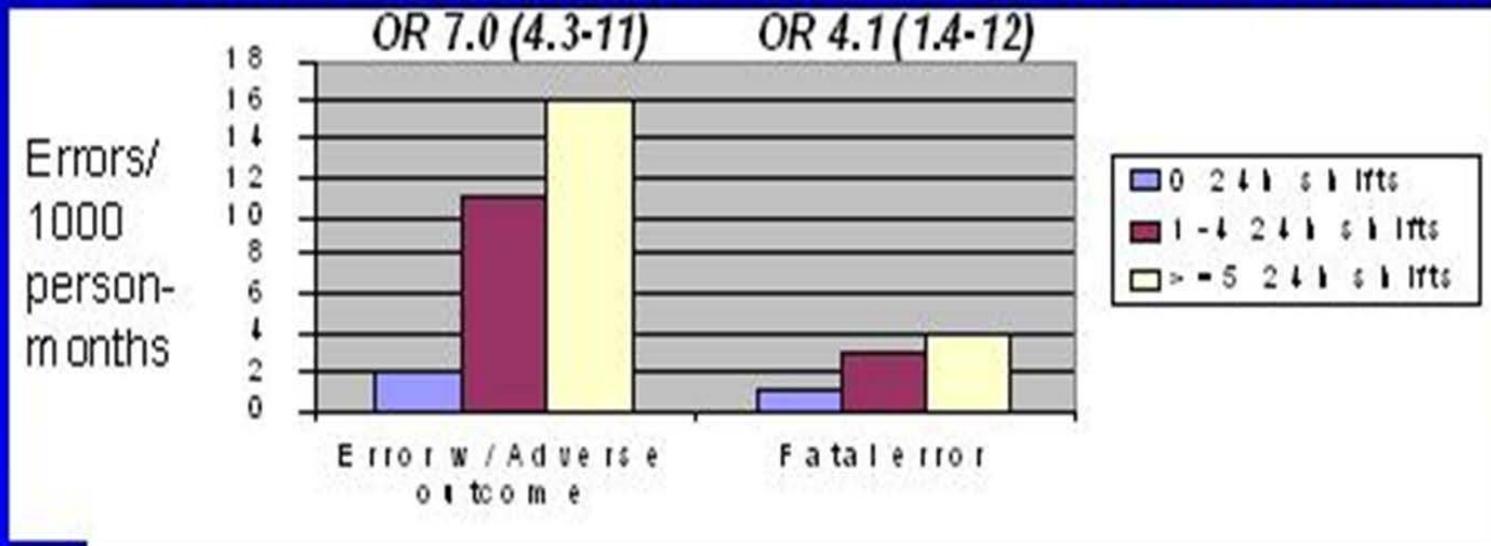
- ACADEMICS

- Decreased satisfaction with learning environment
- Decreased motivation to learn

Effects on PATIENTS

- MEDICAL ERRORS

More harmful fatigue-related errors



Barger et al. *PLoS Medicine* 2006

Effects on PATIENTS

- IMPAIRED CLINICAL PERFORMANCE
 - Errors
 - ECG interpretation
 - Patient monitoring
 - Less efficient procedural performance
 - Umbilical artery catheterization
 - Simulated procedures
 - Clinical procedures

Barger et al. PLoS Medicine 2006, Friedman, et al. NEJM 1971, Storer, et al. Acad Med 1989, Denisco et al, J Clin Monit 1987, Sharpe, et al. Crit Care Med 2010, Taffinder et al Lancet 1998, Goldman et al., J Surg Res 1972

Recognizing Sleep Deprivation

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



Recognizing Sleep Deprivation

- A decline in performance starts after about 15-16 hours of continued wakefulness.
- The period of lowest alertness after being up all night is between 6AM and 11AM.
- Sleepy people underestimate their level of sleepiness and overestimate their alertness
- The sleepier you are, the less accurate your perception of degree of impairment.
- You can fall asleep briefly (“microsleeps”) without knowing it.



Management Strategies

● Naps

- Preventative (pre-call)
- Operational (on call)
 - Short naps
 - 30 minutes or less
 - Long naps
 - 30-180 minutes



Fatigue Management and Countermeasures

- The most effective countermeasure for sleepiness is **SLEEP**.
 - Brief naps prior to 24 hours of sleep loss
 - 15-minute naps every 2 to 3 hours can reduce the performance decrements during 48 hours of total sleep deprivation.
 - 2-hour naps every 12 hours help sustain performance over 80 hours of sleep deprivation



Matsumoto, Ergonomics, 1994; Dinges et al. Sleep, 1987; Bonnet et al. Sleep, 1991

Management strategies

- Get adequate sleep pre-call
 - 7-9 hours
 - Avoid sleep deficit
- Allow adequate recovery
 - 2 nights of extended sleep after period of sleep deprivation

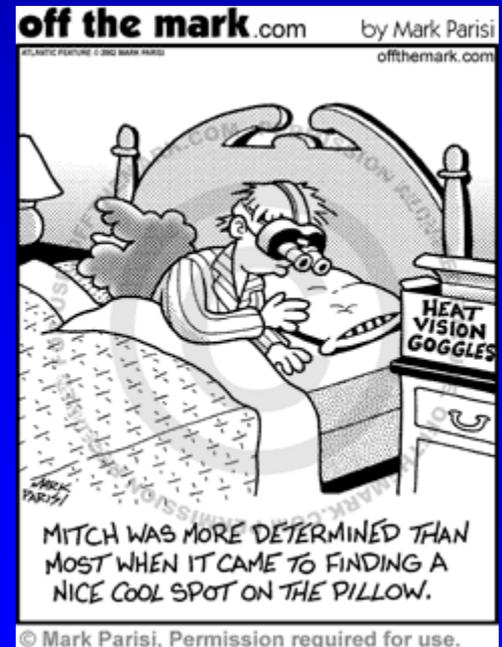
Management strategies

- Avoid use of drugs
 - Hypnotics, stimulants or alcohol
- Strategic consumption of caffeine
 - Effects
 - **Within 15-30 minutes**
 - **Half life 3-7 hours**
 - **Temporary**
 - Problems
 - **Tolerance can develop**
 - **Disrupts subsequent sleep**



Healthy Sleep Habits

- Sleeping environment
 - Cooler temperatures
 - Dark (eye masks, dark shades)
 - Quiet (unplug phone, no pager, ear plugs, etc)
- Don't go to bed hungry
- No heavy meals within 3 hours of sleep
- Regular exercise but no heavy exercise within 3 hours of sleep



Recognizing Signs of Impaired Driving (DWD)

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

Management Strategies

- AVOID driving if drowsy
- Ride with someone else, take a cab or use public transportation
- Take a 20 minute nap and/or drink a cup of coffee before leaving post call
- Stop driving if you notice the warning signs of sleepiness
 - Pull over at a safe place and take a short nap



What Doesn't Work

- Turning up the radio
- Opening the window
- Chewing gum
- Blowing cold air/water on your face
- Slapping (pinching) yourself
- Promising yourself a reward for staying awake



It only takes a
FOUR SECOND
lapse in attention
to have a
drowsy driving crash

Take home lessons

- No magic pill to replace sleep
- Fatigue is an impairment like alcohol or drugs.
- There are significant consequence to you, your family and your patients if you continually function in a sleep deprived state
- Know your own limits and be honest with yourself
- Learn how to adapt and utilize the management strategies
- Medical culture is changing
- We can't eliminate fatigue and sleepiness in training, but they can be managed

Thank you!!



SLEEPING DOGS

It's best to let them lie.