

Sleep, Performance & the Workplace



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Overview

- Why Sleep is Important
- The Consequences of Fatigue in the Workplace
- Shift Work Perils and Countermeasures
- Common Sleep Disorders and Problems
- NSF Healthy Sleep Tips, Educational Materials and National Campaigns & Programs



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Why Care About Sleep?



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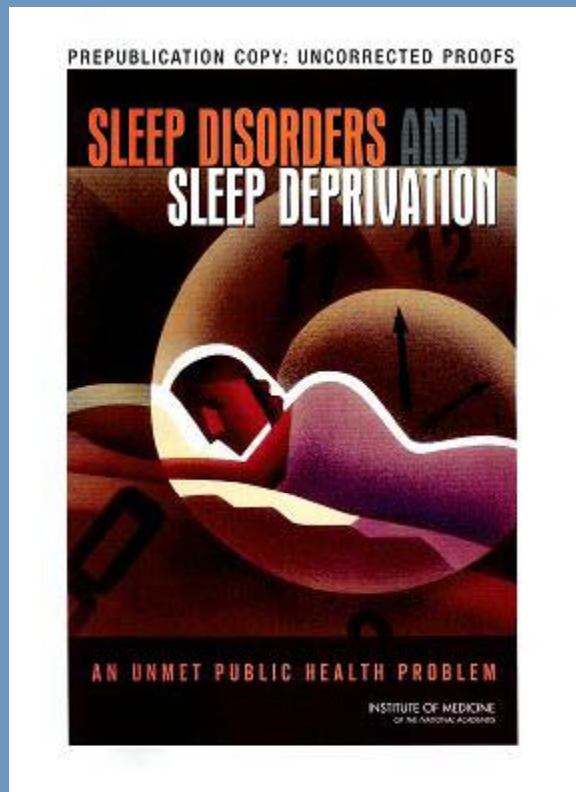
Sleep is Vitally Important...

- For all human functioning
- Cognitive & physical performance
- Restorative properties of REM sleep
- Learning & memory consolidation
- Mood enhancement
- Protects the immune system
- New evidence shows a relationship to weight gain and aging



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Institute of Medicine Report



“An Unmet Public Health Problem”

“The cumulative effects of sleep loss and sleep disorders represent an **under-recognized public health problem** and have been associated with a wide range of health consequences including an increased risk of hypertension, diabetes, obesity, depression, heart attack, and stroke. **Almost 20 percent of all serious car crash injuries in the general population are associated with driver sleepiness.** Hundreds of billions of dollars a year are spent on direct medical costs related to sleep disorders such as doctor visits, hospital services, prescriptions, and over-the-counter medications.”



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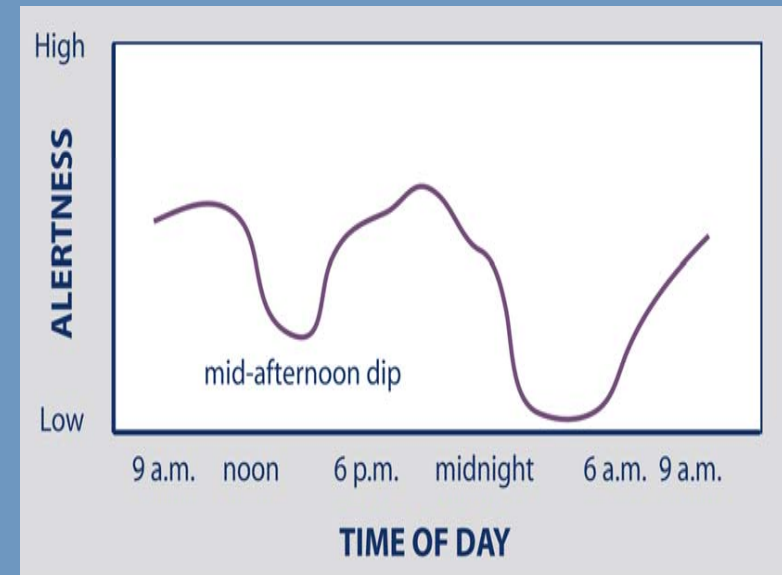
Higher Medical Costs

- Undiagnosed or untreated sleep disorders sufferers utilize the healthcare system more frequently
- Untreated sleep apnea may cause \$3.4 billion in additional medical costs
- People with insomnia use more health care resources than those without insomnia



Sleep is Regulated by two Body Systems

- **Sleep/Wake Restorative Process**
Balances Sleep & Wakefulness
- **Circadian Biological Clock**
Regulates Timing of Sleep & Wakefulness



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Sleep Needs Vary Over the Life Cycle

Newborns/ Infants	0 - 2 months	10.5-18 hours
	2 - 12 months	14-15 hours
Toddlers/ Children	12 - 18 months	13-15 hours
	18 months - 3 yrs.	12-14 hours
	3 - 5 yrs.	11-13 hours
	5 - 12 yrs.	10-11 hours
Adolescents	On Average	9.25 hours
Adults/Older Persons	On Average	7-9 hours



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Sleep Patterns & Characteristics Change Over the Life Cycle

Newborns/ Infants	More active in sleep; 50% REM; several periods of sleep; need naps
Toddlers	Sleep begins to resemble adult patterns
Children	Experience more deep sleep
Adolescents	Shift to later sleep-wake cycle; experience daytime sleepiness
Adults	Need regular sleep schedule to obtain sufficient, quality sleep
Older Adults	More likely to have medical problems; sleep disrupters & disorders; sleep less efficiently



Your Sleep Need

The average amount of sleep you must obtain on a daily basis to maintain alertness & avoid building up a **sleep debt**.



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Sleep Debt



- Each hour of lost sleep is added to your sleep debt.
- Your sleep debt can only be reduced by getting extra sleep. However, you may not be able to reverse the long-term effects of sleep deprivation.
- The larger your sleep debt, the more likely you will experience microsleeps.



Chronically Sleep Deprived...

- The average American sleeps less than 7 hours
- 37% of adults say they are so tired during the day it interferes with daily activities
- 75% of adults experience at least one symptom of a sleep disorder a few nights a week or more
- 55% of adults nap at least once during the week

Source: NSF *Sleep in America* Polls



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Why We Aren't Sleeping...

- Volitional sleep deprivation (work, lifestyle)
- Poor sleep habits
- Circadian factors (shift work)
- Environmental disruptions
- Untreated sleep problems/disorders
- **We don't take sleep seriously!!!**



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Medical Illness Linked to Sleep Loss and Sleep Disorders

- Sleep Loss
 - Increased age-specific mortality
 - Depressive symptoms, anxiety and alcohol use
- Obstructive Sleep Apnea
 - Hypertension
 - Stroke & cardiovascular disease
 - Impaired glucose tolerance
 - Obesity



Fatigue in the Workplace



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The Effects of Sleepiness & Fatigue

- Impaired reaction time, judgment & vision
- Problems with information processing & short-term memory
- Decreased performance, vigilance & motivation
- Increased moodiness & aggressive behaviors
- Increased “microsleeps” – brief (2/3 seconds) sleep episodes



Effects of Sleepiness on Work

When sleepy, people report having difficulty with:

- Concentration-68%
- Handling stress-65%
- Listening-57%
- Relating to others-38%
- Solving problems-57%
- Decision making-56%

Source: NSF 2000 *Sleep In America* Poll



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Work Problems Due to Sleepiness

- Late to work—14%
- Stay home from work—4%
- Fall asleep at work—7%
- Make errors—19%
- Get injured—2%

Source: NSF 2000 *Sleep In America* Poll



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Sleep-Related Fatigue Costs

- Sleep-related fatigue costs for US businesses have been estimated at \$150 billion a year for:
 - Absenteeism
 - Workplace accidents
 - Lost Productivity



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Sleep Loss and Work Related Injuries

- Highly fatigued workers are 70% more likely to be involved in accidents.
- Workers with chronic insomnia have higher rates of accidents.
- Those who report disturbed sleep are nearly twice as likely to die in a work – related accident.



Catastrophes Due to Fatigue

- Union Carbide chemical plant in Bhopal
- Chernobyl
- Three Mile Island
- Exxon-Valdez



The Consequences of Sleep Deprivation on the Highway



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Fatigue vs. Alcohol

- 17 hours sustained wakefulness produces performance impairment = 0.05% BAC
- 24 hours = 0.10% BAC (Dawson & Reid, 1997; Williamson & Feyer, 2000).
- People with mild to moderate untreated sleep apnea performed worse than those with a 0.06% BAC (Powell, 1999)
- On 4 hours sleep, 1 beer can have the impact of a six-pack (Roehrs et al., 1994)



Alertness Strategies

- Recognize signs of fatigue
- Be aware of circadian factors (post-lunch dip)
- Avoid building a sleep debt
- Be aware of sedating medications – use alternatives if available
- Take “Power Naps” (20 minutes in late morning/early afternoon)



When “9:00 to 5:00” Isn’t an Option

Sleep Strategies for Shift Workers



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The Perils of Shift Work

- Depression
- Stress & anxiety
- Divorce
- Increased smoking
- More errors & accidents
- Digestive & gastrointestinal problems
- Cardiovascular disease
- Higher cholesterol
- Possible Carcinogen*

*World Health Organization (WHO) Report 2007.



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Annual Economic Impact of Sleep Problems Due to Late Shifts

- Reduced Manufacturing productivity – 50B
- Increased motor vehicle accidents – 5.7B
- Increased industrial accidents = 4B
- Increased accidents, injuries, and deaths at work – 2.5B
- Increase in other medical and psychiatric illnesses – 2B
- Personnel turnover and retraining – 1B

Total economic impact in billions – 65.2



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A Closer Look at Nurses

- 74% of nurses work 12 hour shifts
- On average, over 15% of nurses fall asleep on the job in a thirty day period.
- Nurses working 12 hour shifts report 3.3 more errors per shift than nurses working 8 hour shifts
- Nurses working 12hr shifts have higher absenteeism rates than nurses working 8 hour shifts



Shift Work: Promoting Alertness at Work

- Take short breaks
- Use the buddy system
- Exercise on breaks
- Use caffeine as a tool not as a crutch
- Schedule demanding tasks when you are most alert
- Share ideas with others in the same position
- Eat healthy



Shift Work: Promoting Sleep at Home

LIGHT

- Darken the bedroom & bathroom
- Install light blocking & sound absorbing curtains or shades
- Wear eye shades
- Wear dark sunglasses on the drive home

SOUND

- Wear ear plugs or white noise machine
- Install carpeting & drapes to absorb sound
- Unplug the telephone & publicize your work schedule to family & friends



Recognizing Sleep Problems & Disorders



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Sleep Problems/Disorders Can be Serious

- Symptoms & experiences of sleep problems should be discussed with a doctor
- Snoring, sleep apnea, restless legs syndrome & narcolepsy are all treatable



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✓ **Check if any of the following apply to you:**

- Snore loudly
- You or others have observed that you stop breathing or gasp for breath during sleep
- Feel sleepy or doze off while watching TV, reading, driving or engaged in daily activities
- Have difficulty sleeping 3 nights a week or more (*e.g., trouble falling asleep, wake frequently during the night, wake too early and cannot get back to sleep or wake unrefreshed*)
- Feel unpleasant, tingling, creeping feelings or nervousness in your legs when trying to sleep
- Interruptions to your sleep (*e.g., nighttime heartburn, bad dreams, pain, discomfort, noise, sleep difficulties of family members, light or temperature*)



Common Sleep Problems

- Chronic or short-term insomnia (more than 50% of all U.S. adults)
- Snoring (90 million Americans snore, 37 million habitually)
- Sleep Apnea (18 million Americans)
 - 2-7x increased driving risk
- Restless Legs Syndrome (12 million Americans)



Medical Illness and Sleep

- People who sleep well may still be troubled by excessive daytime sleepiness resulting from underlying medical illnesses
- A sleep disturbance may be a symptom of underlying medical illness itself or may be an adverse effect of therapy
- The stress associated with chronic illness can also cause daytime alertness or sleep problems



National Sleep Foundation Healthy Sleep Tips!



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Tips to Promote Sleep

- Maintain a regular bed & wake time schedule including weekends
- Establish a regular, relaxing bedtime routine
- Create a dark, quiet, comfortable & cool sleep environment
- Sleep on a comfortable mattress & pillow
- Use your bedroom only for sleep & sex, not work or other stressful activities



Tips to Promote Sleep (cont.)

- Finish eating at least 2-3 hours before your regular bedtime.
- Exercise regularly. It is best to complete your workout at least a few hours before bedtime.
- Avoid caffeine, nicotine & alcohol close to bedtime. They can disrupt sleep later in the night.
- Avoid napping if it will disrupt your sleep later that night.



A Word About Napping

- When is a nap helpful?
- What time of day is best?
- How long should a nap last?
- What are the real benefits?



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NSF Campaigns and Programs



Katie had everything going for her...



...except enough SLEEP.

18-year old Katie Drentlaw had just accepted a full college scholarship for track and field. Despite being tired, she decided to make the three and a half hour drive home after viewing an all-day competition. She had just 12 miles to go when she fell asleep at the wheel and crashed into a dirt embankment. She was killed instantly.



www.DrowsyDriving.org

National Sleep Foundation
Drowsy Driving Prevention Week
 November 5-11, 2007

At least **100,000** crashes each year are the result of **driver fatigue**.

Your contribution can help.



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Summary

- Sleep is a basic biological need that is essential to our health, performance, safety & quality of life.
- Sleep deprivation has serious negative consequences, especially for shift workers
- Signs & symptoms of sleep difficulties need to be identified & discussed with a doctor.
- Establishing healthy sleep practices prevents sleep problems & promotes optimal sleep.

For more information visit www.sleepfoundation.org



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