Sleep, Performance & the Workplace
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
Why Care About Sleep?
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
“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.”
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*
### Sleep Needs Vary Over the Life Cycle

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Age Range</th>
<th>Sleep Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborns/Infants</td>
<td>0 - 2 months</td>
<td>10.5-18 hours</td>
</tr>
<tr>
<td></td>
<td>2 - 12 months</td>
<td>14-15 hours</td>
</tr>
<tr>
<td>Toddlers/Children</td>
<td>12 - 18 months</td>
<td>13-15 hours</td>
</tr>
<tr>
<td></td>
<td>18 months - 3 yrs.</td>
<td>12-14 hours</td>
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<td></td>
<td>3 - 5 yrs.</td>
<td>11-13 hours</td>
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<tr>
<td></td>
<td>5 - 12 yrs.</td>
<td>10-11 hours</td>
</tr>
<tr>
<td>Adolescents</td>
<td>On Average</td>
<td>9.25 hours</td>
</tr>
<tr>
<td>Adults/Older Persons</td>
<td>On Average</td>
<td>7-9 hours</td>
</tr>
</tbody>
</table>
## Sleep Patterns & Characteristics Change Over the Life Cycle

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

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

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

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
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

National Sleep Foundation
Recognizing Sleep Problems & Disorders
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
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.
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Healthy Sleep Tips!
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?
NSF Educational Materials

- Sleep Sheet
- Sleep Diary
- The ABCs of ZZZs
- Restless Legs Syndrome
- Women & Sleep

National Sleep Foundation
NSF Campaigns and Programs

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.

National Sleep Awareness Week
March 5-11, 2007

National Sleep Foundation

Katie had everything going for her...

...except enough SLEEP.

18-year old Katie Drenlaw 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.

National Sleep Foundation

Drive Alert...Arrive Alive®

www.DrowsyDriving.org
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