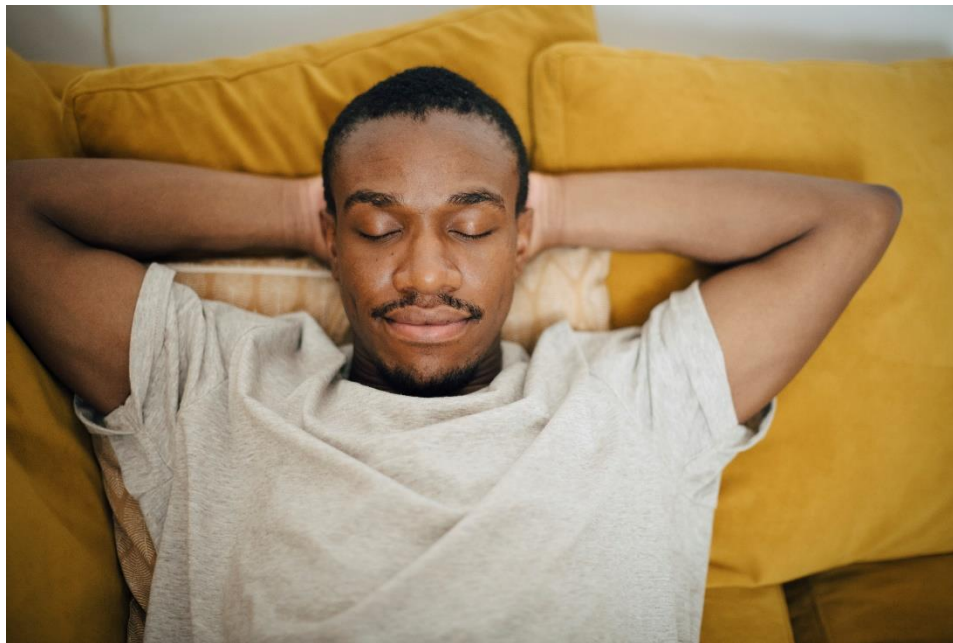


LACK OF SLEEP AND FATIGUE, ARE THEY THE SAME THING?



- Definitions/Causes of Sleepiness and Fatigue
- About sleep
 - Patterns and Stages
 - How much sleep do we need?
- Sleep Disorders
 - Types
 - Prevalence
 - Symptoms
 - Causes
- Sleep deprivation and the consequences



Definition of Sleepiness

- Sleepiness is the desire to fall asleep.
- It is sometimes referred to as drowsiness and typically increases the longer we stay awake.



Causes of Sleepiness

- Not getting enough sleep, sometimes by choice, is the most common cause of excessive sleepiness.
- Working at night and sleeping during the day.
- Other causes include drug, alcohol, or cigarette use, lack of physical activity, obesity, and the use of certain medications.



Definition of Fatigue

- Fatigue is generally defined as a feeling of lack of energy and motivation that can be physical, mental or both. Fatigue is not the same as drowsiness, but the desire to sleep may accompany fatigue.
- Apathy is a feeling of indifference that may accompany fatigue or exist independently. In addition, individuals often describe fatigue using a variety of terms including weary, tired, exhausted, malaise, listless, lack of energy and feeling run down.



Causes of Fatigue

- Causes of fatigue range from those that cause poor blood supply to the body's tissues to illnesses that affect metabolism, from infections and inflammatory diseases to those that cause sleep disturbances.
- Fatigue is a common side effect of many medications. While numerous patients with psychological conditions often complain of fatigue (physical and mental), there are also a group of patients where the cause of fatigue is never diagnosed.



Sleepiness vs. Fatigue

- **Sleepiness and fatigue are two distinct conditions.**
- Sleepiness refers to the inability to stay awake even in situations in which wakefulness is required, such as at work or behind the wheel of a car.
- Fatigue is a state of overwhelming sustained exhaustion and decreased capacity for physical and mental work that is not relieved by rest.



Sleep vs. Fatigue

- We spend 1/3 of our lives asleep
- Sleep is an active process
 - ✓ No organ or regulatory system “shuts down”
 - ✓ Slight decrease in metabolic rate
- Some brain activity increases during sleep
 - ✓ Delta Waves
 - ✓ Many parts of the brain are as active as awake periods
- Specific hormones increase during sleep
 - ✓ Melatonin
 - ✓ Growth



- 5 stages of sleep during a normal night
- Stages 1-4 or non-REM and REM (rapid eye movement)
 - During non-REM sleep (NREM), many of the restorative functions of sleep occur
 - During REM sleep, memories and thoughts from the day are processed

Stages of Sleep

- Stages progress cyclically
 - 1-4 , then REM, restart back at stage 1
- One complete cycle takes about 90-110 minutes
- First cycles have relatively short REM sleeps
- REM sleep time increases in later cycles



Figure 1. The four stages of sleep.

Stages

- Stage 1
 - Light sleep, drift in and out, awoken easily
 - Eyes move slowly, muscle activity slows
 - May experience a sense of falling followed by sudden muscle contractions
- Stage 2
 - Eye movement stops
 - Brain waves are slower, occasional bursts of rapid waves



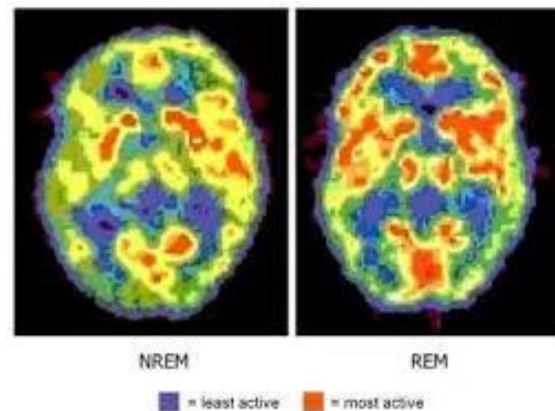
- Stage 3
 - Extremely slow waves-Delta waves
 - Interspersed with smaller faster waves
 - Considered deep sleep
 - No eye or muscle movement, difficult to awaken
 - Time when sleepwalking, bedwetting, or terrors occur
- Stage 4
 - Almost exclusively Delta waves
 - Considered deep sleep



- Brain waves increase to the awake level
- Most dreams occur during this stage
 - If awoken in this stage, most people remember their dreams
- Physical changes during REM
 - Increase in H.R., B.P., and breathing rate
 - Breathing shallower and irregular
 - Eyes jerk rapidly
 - Limb muscles temporarily paralyzed
 - Some loss of temperature regulation

Rapid Eye Movement Stage

- Most people have 3-5 intervals of REM each night
- Infants spend 50% of time in REM
- Adults spend nearly half of time in Stage 2
 - 20% in REM, other 30% divided among other stages
 - Progressively spend less time in REM as we age



Sleep vs. Fatigue

- Infants 16-20
- Toddlers 12-14
- Pre School 11-13
- School Age 10-11
- Teens 9.5-10



- Most adults need 7½-8 hours of sleep to function well
 - About 10% require more sleep (or less)
 - Pregnant women need more sleep

Sleep vs. Fatigue

- An estimated 50% of Americans are sleep deprived
- 30% average less than 6 hours per night
- Estimated 70 million with insufficient sleep
- 7 out of 10 have trouble sleeping
- 40 million suffer from some long-term disorder
- 20 million experience occasional problems
- 1/3 of Americans have symptoms of insomnia



Why Don't People Get Enough Sleep?

- Not going to bed! Inadequate time in bed...
 - Must be “productive” mentality
 - Attitude that sleeping is not necessary
- Poor Sleep Hygiene
- Sleep Disorders



Common Sleep Disorders

- Snoring/Apnea
- Insomnia 9-12%
- Narcolepsy
- Restless leg syndrome-5%
- Over 80 different disorders



Disorders Website, University of MD

http://www.umm.edu/sleep/adult_sleep_dis.htm

Signs of Sleep Disorders

- Consistent failure to get enough sleep or restful sleep
- Consistently feeling tired upon waking &/or waking with a headache
- Chronic fatigue, tiredness, sleepiness during the day
- Struggling to stay awake while driving or doing something passive, e.g., watching TV



Signs of Sleep Disorders

- Difficulty concentrating at work or school
- Slowed or unusually delayed response to stimuli or events
- Difficulty remembering things or controlling emotions
- Frequent urge to nap during the day
- Snoring or ceasing to breathe during sleep



- Difficulty initiating sleep, maintaining sleep, and/or nonrestorative sleep for at least 1 month
- Primary: insomnia is not related to other medical or psychiatric problems
- One of the most common sleep disorders:
1/3 of general population
- Women report insomnia 2x as often as men

Contributing Factors:

- Medical factors, such as pain & physical discomfort and respiratory problems
- High body temperature
- Inactivity during the day
- Psychological disorders
- Stress
- Unrealistic expectations regarding sleep
- Poor bedtime habits or sleep hygiene
- Rebound insomnia (sleeping pills)

Primary Insomnia

Treatments:

- Prescription drugs
- Relaxation training
- Stimulus control procedures
- Setting regular bedtime routines
- Sleep restriction
- Confronting unrealistic expectations about sleep



- Features:
 - Daytime sleepiness
 - Irresistible attacks of sleep occur almost daily
 - Cataplexy – sudden loss of muscle power (associated with intense emotion & the sudden onset of REM sleep)
- Treatments:
 - Stimulants
 - Antidepressants



- Sleep is disrupted by a sleep-related breathing condition
- Breathing is interrupted during sleep, producing numerous brief arousals during the night
- Leads to excessive sleepiness during the day

Treatments:

- Weight loss
- Medications to stimulate breathing
- Mechanical devices to reposition tongue or jaw

Symptoms: restricted airflow &/or brief periods (10-30 seconds) whereby breathing ceases completely

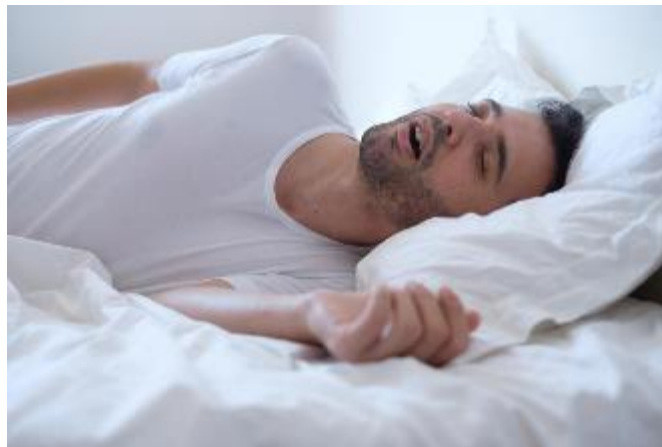
Signs: loud snoring, heavy sweating during the night, morning headaches, sleep attacks during the day

Obstructive Sleep Apnea: airflow stops despite continued respiratory activity; airway is too narrow, damaged, abnormal

Central Sleep Apnea: complete cessation of respiratory activity

Contributing Factors: more common in males, the obese, & middle to older age

Prevalence: occurs in 10-20% of population



Signs of Sleep Deprivation

- Needing an alarm clock to wake up
- Falling asleep within 5 minutes of hitting the pillow
- Well-rested people take 10-15 minutes
- Napping easily
- High number on the Epworth Sleepiness Scale



Chronic sleep deprivation has been shown to raise the risk for:

- Depression
- Obesity
- Cardiovascular disease
- Reproductive complications

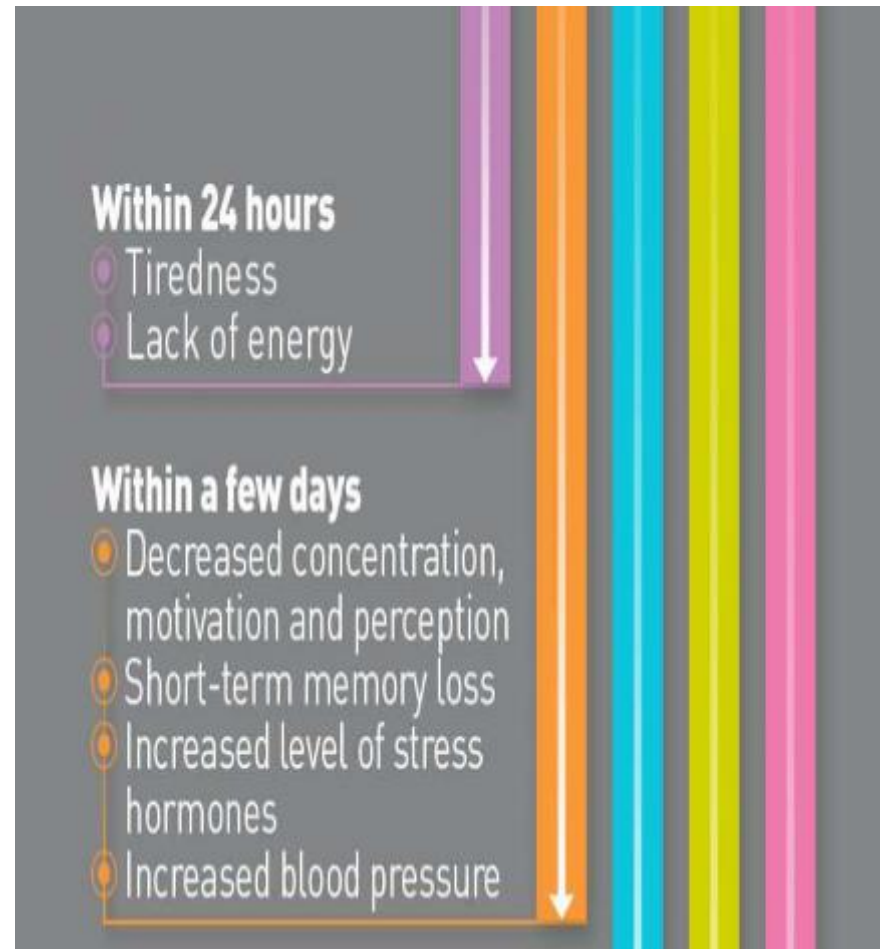


These issues can lead to decreased productivity and increased healthcare costs for employee and employer alike.

Sleep Deprivation

In the short term, lack of sleep can cause issues with:

- Tardiness
- Absenteeism
- Concentration
- Listening to others
- Solving problems
- Making decisions
- Decreased attention, memory recall & vigilance



Sleep Deprivation

As your body's sleep debt increases, the more likely you are to experience **microsleeps—a brief episode of sleep** which can last anywhere from a fraction of a second up to 30 seconds.



During a microsleep, you are temporarily unconscious.

Sleep Deprivation

- Highly fatigued workers are 70% more likely to be involved in an incident resulting in injury.
- Workers who report disturbed sleep are nearly twice as likely to die in a work-related incident.



Sleep Deprived & Driving

A recent AAA Foundation report estimated 328,000 crashes annually due to drowsy driving, with 109,000 resulting in injury and **6,400** resulting in a fatality.

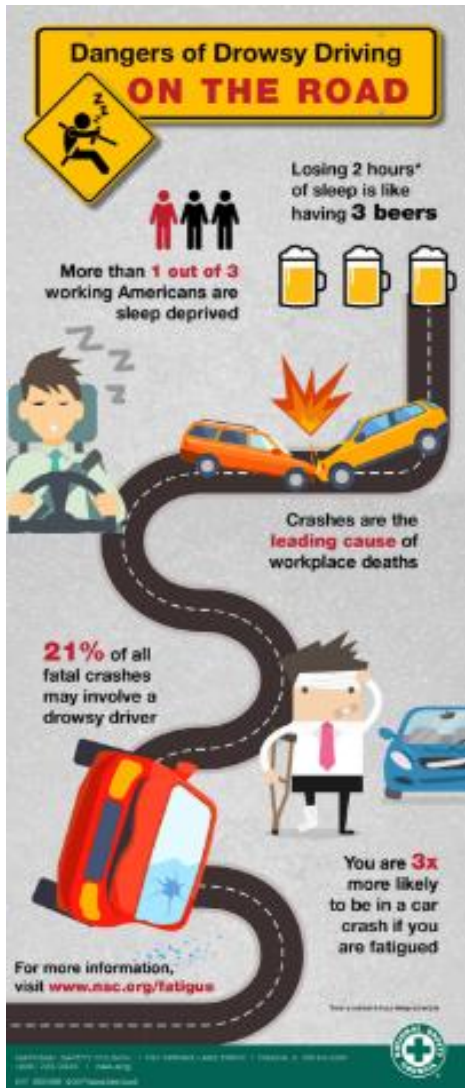
Drowsiness affects drivers in much the same way as alcohol:

- Reduced attentiveness
- Slowed reaction time
- Impaired judgment



Driving while **drowsy** increases crash risk by nearly **300%!**

Sleep Deprivation



Whether you are driving on the job, commuting to or from work, or are off the clock...**make sure you are not too drowsy to drive.**

- Pull over to a safe place and take a 15–20-minute nap if possible
- If you are extremely fatigued, don't attempt to drive; call a friend, family member, colleague, fleet dispatch, cab or ride share to complete your trip safely

Sleep Deprivation

About **15%** of the U.S. workforce does not keep a traditional schedule.

- Drivers
- Law enforcement
- First responders
- Nurses and doctors



- Because of this schedule, their body's internal clock, or **circadian rhythm**, is out of sync.
- The circadian rhythm tells the body to become alert in morning and drowsy at night and produces sleep-promoting chemicals like melatonin.
- Even though their schedules may be different, shift workers still need the same amount of sleep.

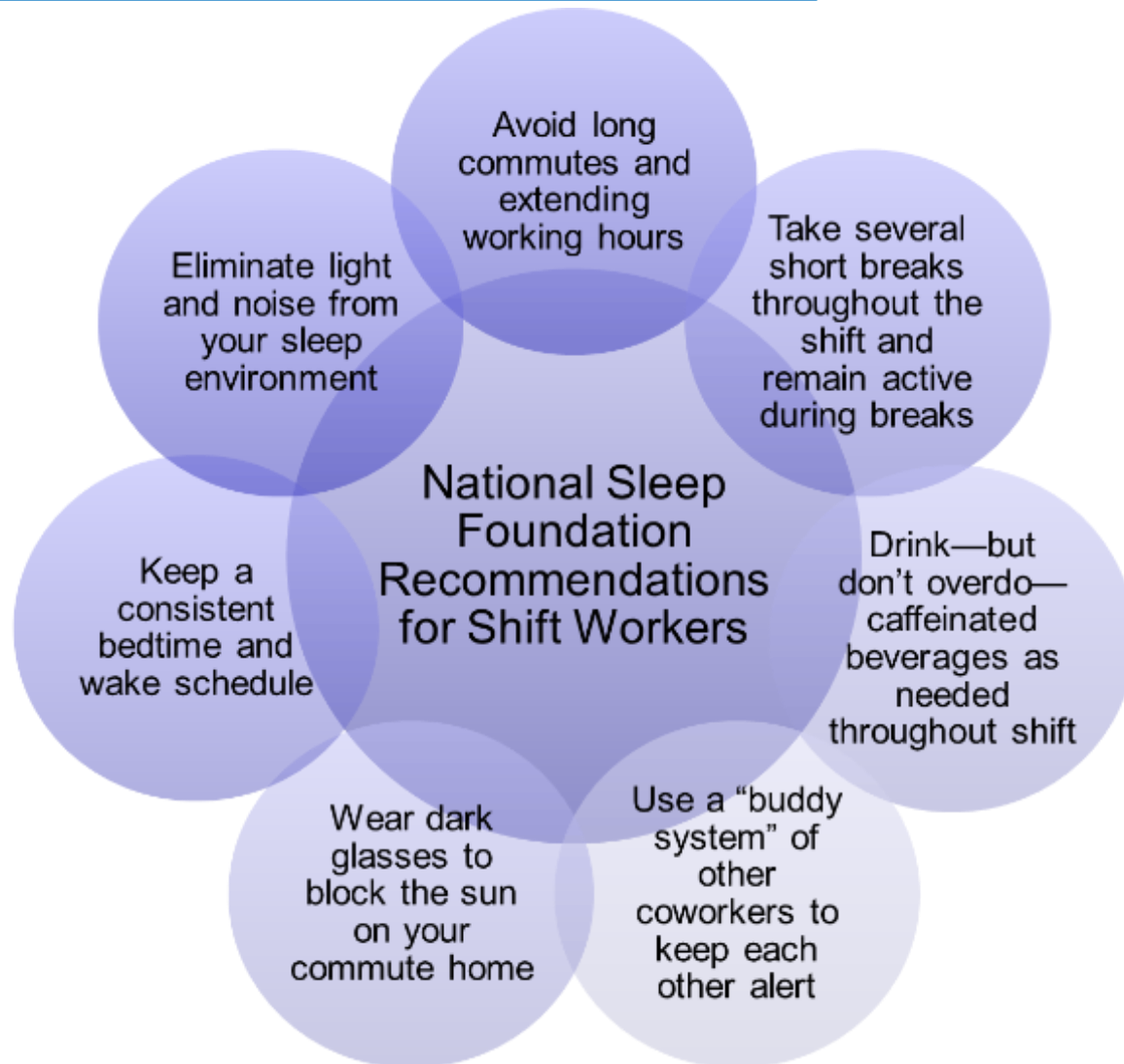
Tips from the NSF*



- Create and follow a sleep schedule. Go to bed and wake up at the same time every day.
- Ensure your bedroom or sleeping area is quiet and dark - keep the temperature moderate - neither hot nor cold.
- Make sure your bed is comfortable and remember that bedtime is for sleeping and not reading or watching TV.
- Avoid the use of gadgets that emit light, especially smartphones and tablets. Using these devices before going to bed can inhibit restful sleep.
- Don't eat a heavy meal right before bedtime.

*National Sleep Foundation

Sleep Deprivation



- The Relationship Between Sleep and Health is clear.
- Not getting enough sleep can have profound consequences on a daily and potentially long-term health and mental well-being.
- What many people do not realize is that a lack of sleep—especially on a regular basis—is associated with long-term health consequences, including chronic medical conditions like diabetes, high blood pressure, and heart disease, and that these conditions may lead to a shortened life expectancy.

Summary

- Fatigue is more a long-term issue and getting rest does not cure the affects.
- Stress can cause fatigue, to avoid the effects, exercise can help your body deal with stress.
- If you are experiencing long term sleep issues consult your doctor.



Health & Safety Training Specialists

(717) 772-1635

RA-LI-BWC-PATHS@pa.gov



Questions?

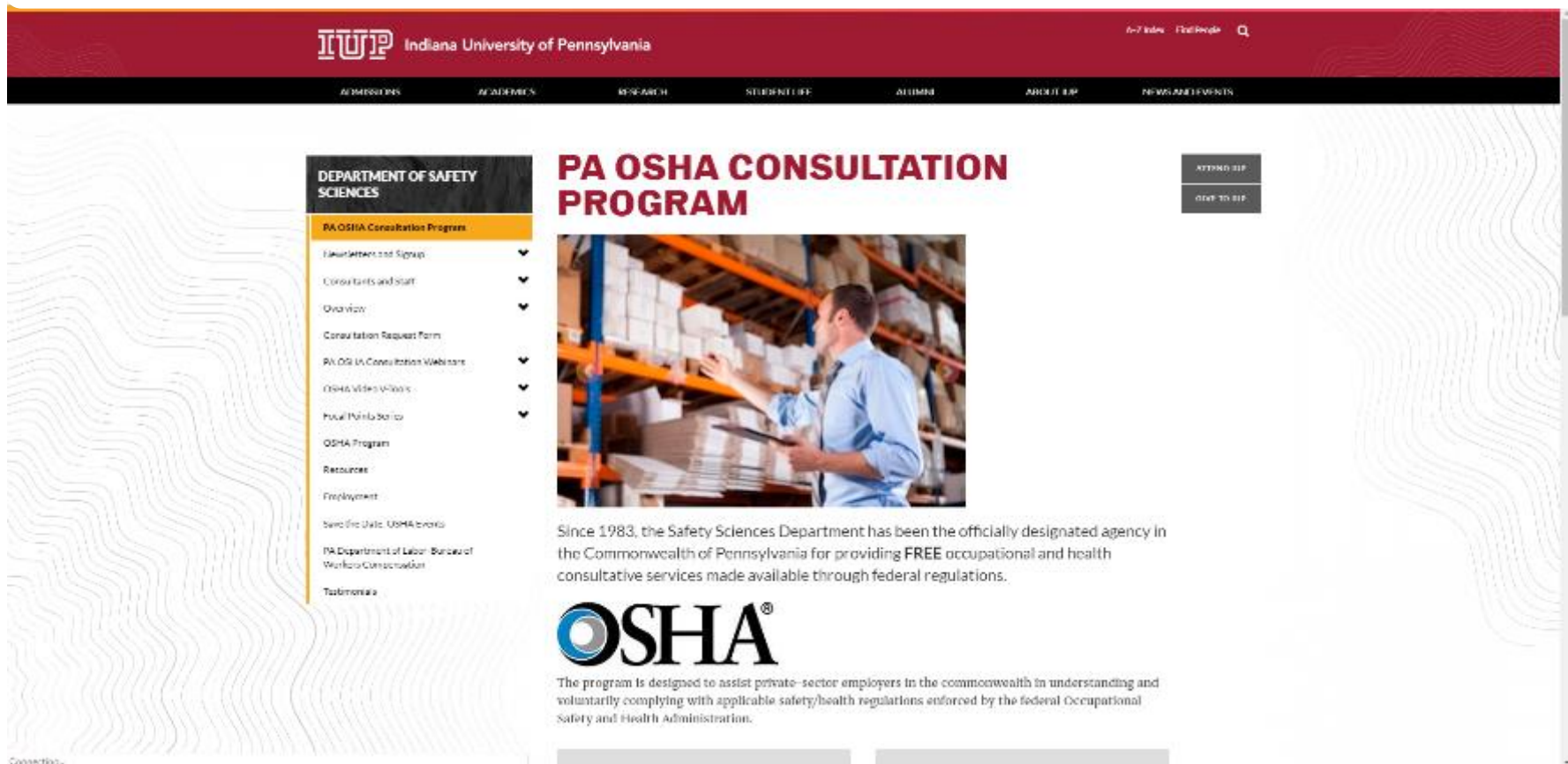


NSC Fatigue Safety Toolkit



Visit nsc.org/members to download this toolkit and other great resources.

Telephone Number 1-800-382-1241



The screenshot shows the website for the PA OSHA Consultation Program. At the top, there is a red navigation bar with the IUP logo and the text "Indiana University of Pennsylvania". Below this is a black navigation bar with links for ADMISSIONS, ACADEMIES, RESEARCH, STUDENT LIFE, ALUMNI, ABOUT IUP, and NEWS/EVENTS. The main content area features a dark sidebar on the left with the heading "DEPARTMENT OF SAFETY SCIENCES" and a list of menu items: PA OSHA Consultation Program (highlighted), Email Letters and Signage, Consultants and Staff, Overview, Consultation Request Form, PA OSHA Consultation Webinars, OSHA Video Library, Physical Health Services, OSHA Program, Resources, Employment, Service Units: OSHA Events, PA Department of Labor: Bureau of Workplace Construction, and Testimonials. The main content area has a large heading "PA OSHA CONSULTATION PROGRAM" and a photograph of a man in a warehouse. Below the photo is a paragraph: "Since 1983, the Safety Sciences Department has been the officially designated agency in the Commonwealth of Pennsylvania for providing FREE occupational and health consultative services made available through federal regulations." Below this is the OSHA logo and another paragraph: "The program is designed to assist private-sector employers in the commonwealth in understanding and voluntarily complying with applicable safety/health regulations enforced by the federal Occupational Safety and Health Administration." On the right side of the main content area, there are two buttons: "ATTEND IUP" and "GO TO IUP".

Pennsylvania Occupational Safety & Health Surveillance (PennOSHS) Program



Collaborates with workers, employers, & occupational health stakeholders to build a sustainable statewide occupational health network



Prioritizes data-driven research and characterizes factors associated with occupational injury and disease to produce and distribute occupational safety and health information



Monitors adult lead exposure to promote the reduction of lead poisoning, particularly among workers



Partners with employers to review safety policies, create relevant educational material, and improve worker wellbeing

Visit our website
to learn more:



Interested in partnering with us?

CONTACT US:

Phone: 717-787-3350

Email: dehe@pa.gov



Pennsylvania Department of Health
Bureau of Epidemiology

Division of Environmental Health Epidemiology

Bibliography

Dr. Terri Prodoehl, Health sciences
James Madison university, July 2009

MEMBERSHIPINFO@nsc.org

Learn more at
nsc.org/fatigue



people.uncw.edu/okinek/psy347/Files/Sleep%20Disorders

Disorders Website, University of MD
http://www.umm.edu/sleep/adult_sleep_dis.htm

<https://www.sleepfoundation.org/press-release/lack-sleep-affecting-americans-finds-national-sleep-foundation>

<https://www.purica.com/sleep/10-reasons-people-dont-get-enough-sleep/>

Charles M. Morin, ... Simon Beaulieu-Bonneau, in Principles and Practice of Sleep Medicine (Sixth Edition), 2017