CPH News and Views
A semi-monthly column on emerging topics related to healthy workplaces

Issue # 12: How does sleep quality impact safety and health, especially among shift workers, and what can be done to help?

Contributed by Yuan Zhang, M.S., Dept. of Nursing, University of Massachusetts Lowell

Do you feel sleepy or doze off during the day? Do you lose attention during a meeting or discussion? Do you find it hard to stay awake while driving, eating meals or engaging in social activities? If so, you are probably sleep-deprived, a very common experience among Americans today. Sleepiness is akin to thirst or hunger, pointing to one of the body's essential needs.

Sleep is now recognized as a dynamic activity in our brains rather than a passive, dormant part of our daily life. Recent studies have identified the stages of the sleep cycle across the night, and the important effects of sleep on people's daily functioning as well as our physical and mental well-being. During each full sleep cycle (usually 7-8 hours), people experience two types of sleep: REM (rapid eye movement) and NREM (non rapid eye movement). NREM sleep has 4 stages, ranging from very light sleep (stage 1) to very deep, restorative sleep (stages 3 and 4). In all stages of NREM sleep, people move in bed, repositioning themselves, often without awakening, but there is very little dreaming. In contrast, in REM sleep the body becomes normally paralyzed and there is intense dreaming. The paralysis of the muscles of the body prevents the person from acting out dreams. REM sleep is believed to be involved in processing emotions, retaining memories and relieving stress.

In today's "24/7" global economy, it is increasingly common that people must accept "shift work," meaning evening or night work, rotating shifts, and working on-call. Shift workers include nurses and other human services personnel, especially those in institutions such as hospitals and nursing homes, and people who work in retail, utilities, and transportation. It is also increasingly common for people to work 12-hour or overtime shifts, sometimes because they have chosen "flextime" arrangements but other times not by choice.

Safety and health concerns

Shift work has long been known to have a significant influence on the body's sleep-wake rhythm. Insufficient sleep may also result from habits such as caffeine intake during the day or watching television late at night. People who do not get enough sleep often experience sleepiness during the daytime. There are many health and safety concerns associated with sleep disturbance and poor sleep quality, such as:

- Increased fatigue, irritability, poor attention, anxiety, and depression
- Increased appetite leading to becoming overweight and obesity
- Chronic diseases such as diabetes, gastrointestinal disorders, cardiovascular disease, breast cancer, and prostate cancer
- Unhealthy behaviors like smoking and routine use of alcohol, stimulants, or sleep medicines
- Impaired attention or performance that might contribute to mistakes and accidents, such as needle sticks or car accidents
- Missed social and family activities, as well as family conflicts due to fatigue, frustration, and emotional sensitivity

What can we do to improve our sleep quality?

(1) Behavioral strategies

- Modify the sleep environment: install opaque coverings over windows to prevent light from entering bedroom; turn off the telephone to minimize disturbance; keep a cool temperature and low humidity in the bedroom for comfort; change to a high-quality mattress, pillow and bed coverings; and stay away from bright light for several hours before bedtime. Sleep

experts recommend wearing dark sunglasses before leaving work after a night shift to prevent the circadian rhythm from being triggered by the morning light.

- Improve "sleep hygiene:" get regular exercise (but several hours away from bedtime!); reduce fluid intake before bedtime; avoid caffeine, tobacco, and alcohol; take a warm bath before sleep; maintain a consistent wake-up time, and avoid noise and temperature extremes near sleep time.
- Take small naps: there are some reports that taking a brief nap while working the night shift has the potential to reduce sleepiness, but many workplaces still prohibit the practice.
- Social support: it is important to build a broad and strong social network to help cope with the stress of shift work. Well-informed friends and family members will better understand when the night shift worker is tired or emotionally stressed at times when s/he has family responsibilities or social opportunities.

(2) Pharmacological agents

- Melatonin is a naturally secreted hormone in the human body to help regulate the circadian rhythms of biological functions. Melatonin helps promote sleep if taken during the day and has little significant effect on alertness, performance or function during the following night shift. Shift workers can take melatonin in the early morning following a night shift, in an attempt to fall asleep more quickly. However, the effectiveness of melatonin varies from one person to another.
- Modafinil and armodafinil promote wakefulness and are approved for use in patients with excessive sleepiness. Modafinil improves alertness, vigilance, executive function, and ability to sustain attention during night shifts in the laboratory. One study showed that modafinil (30-60 minutes before regularly scheduled night shifts) could improve the functional status and quality of life among shift workers.

In conclusion, sleep quality is a big health and safety concern among shift workers. It can be improved by modifying the sleep environment, improving sleep hygiene, taking small naps, building social support, as well as occasionally taking effective medicines when needed.

Yuan Zhang, M.S., is a PhD student in the Dept. of Nursing, University of Massachusetts Lowell. She is studying the causes of sleep disturbance and its impacts on the health and safety of shift work nurses.

Recommended websites:

http://www.ninds.nih.gov/disorders/brain_basics/understanding_sleep.htm
http://www.cdc.gov/sleep/chronic_disease.htm
http://www.sleepfoundation.org/site/c.huIXKjM0IxF/b.2421189/k.DF93/Strategies_for_Shift_Workers.htm

Recommended journal articles:

Erman, M.K., Rosenberg, R. (2007). Modafinil for excessive sleepiness associated with chronic shift work sleep disorder: Effects on patient functioning and health-related quality of life. J Clinical Psychiatry 9(3): 188-194.

Sharkey, K.M., Fogg, L.F., Eastman, C.I. (2001). Effects of melatonin administration on daytime sleep after stimulated night shift work. J Sleep Research 10(3): 181-192.

Takeyama, H., Kubo, T., Itani, T. (2005). The nighttime nap strategies for improving night shift work in workplace. Industrial Health 43(1): 24-29.

Walsh, J.K., Randazzo, A.C., Stone, K.L., Schweitzer, P.K. (2004). Modafinil improves alertness, vigilance, and executive function during simulated night shifts. Sleep 27: 434-439.

CPH-NEW
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