Nursing, night shift, and nutrition

Planning and preparation can mitigate the negative effects of working nights.

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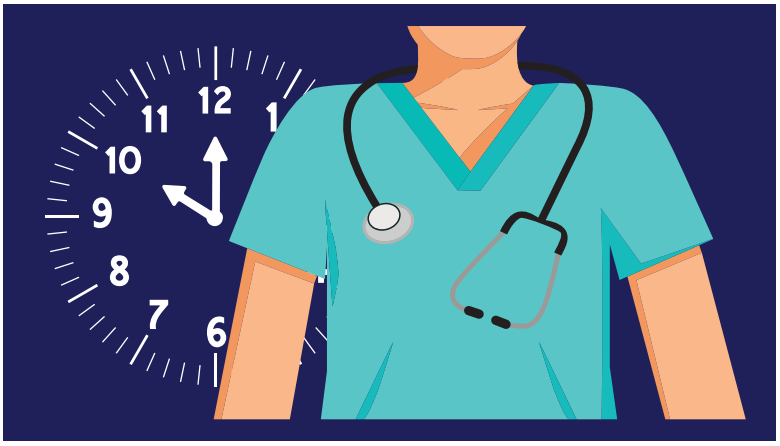
NURSING is a professional calling to provide human caring and compassion; reduce suffering; and restore and improve health, well-being, function, and quality of life. Florence Nightingale said, "No amount of medical knowledge will lessen the accountability for nurses to do what nurses do; that is, manage the environment to promote positive life processes." This includes the 24-hour, 7-day-a-week nature of the work, which affects nurses' health and well-being, including nutrition, particularly when working night shift. Fortunately, evidence-based strategies are available to help you protect and improve your health and well-being while remaining committed to your professional calling.



Night shift and physiology

As new nurses are hired into inpatient positions, they quickly experience the reality of 24-hour, 7-day-a-week demands, challenging night shifts, 12-hour–plus shifts, rotating shifts, and (for many) overtime. New nurses, by virtue of seniority and clinical ladders, frequently are assigned night shifts and rotating shifts. The result can be physiologic changes that have negative health effects. (See *Negative effects of shift work.*)

For example, working nights will interfere with your natural circadian rhythm (24-hour sleep/wake cycle). (See *Keeping rhythm.*) Researchers who've studied circadian rhythm misalignment found elevated glucose and insulin levels, an inverted cortisol rhythm, significantly lower leptin levels (resulting in decreased activity and increased appetite), and reduced sleep efficiency. If you work night shifts, disrupted circadian rhythms and sleep-wake cycles are inevitable.

Family responsibilities in addition to work demands can lead to swinging between night and daytime sleep, resulting in chronic disruptions and misaligned circadian rhythms.

Night shift and nutrition

Night-shift work may alter your eating patterns (which impact your body's regulator responses to metabolism) and food choices. Chrononutrition, a new field of research focused on the intersection of circadian biology and diet, has emerged in response to altered and misaligned circadian rhythms. It looks at three aspects related to the timing of eating: eating pattern consistency/inconsistency, meal frequency (number), and when (clock time) meals are eaten. A recent systematic review and meta-analysis found poor glucose tolerance in nighttime vs. daytime eating when comparing postprandial glucose and insulin responses. And several studies have found a relationship between altered circadian rhythms, eating patterns, and obesity. These studies have important implications for night-shift and rotating-shift nurses who require strategies to mitigate the negative effects of this type of work.

Healthcare organizations, which regulate schedules, staffing, and workflow, and professional organizations, which advocate for

Negative effects of shift work

Whether you're working straight night shift or rotating shifts, you may experience several negative effects that affect your quality of life.

Sleep disruption
- fatigue
- sleep deprivation
- poor sleep hygiene
- poor sleep quality
- circadian rhythm interruptions

Psychological impact
- interpersonal relationship disruptions
- mood alterations

Health issues (higher risk of the following)
- obesity
- diabetes
- cancer
- infections
- cardiovascular disease including heart attack and stroke
- infections

Job and general function issues
- low job satisfaction
- lower tolerance for job workloads
- cognitive changes (such as difficulty concentrating, reduced mental alertness, and forgetfulness)
- impaired perceptual and motor abilities.

Not only will the negative effects impact work during a given shift, but they also may spill over into the next day. The result can be increased risk for patient care errors on consecutive shifts and disruption in your overall quality of life.

nurse well-being, can develop creative solutions to promote good nutrition that offsets some of the negative physiologic effects of night-shift work.

Best nutrient options

Choose light snacks—such as fruits, vegetables, protein (nuts, eggs, yogurt, tuna), and salads—that will increase energy during your shift. Research suggests that small, healthy meals and snacks are important for night-shift workers. A study by Gupta and colleagues found that eating a large meal during the night shift impairs cognitive performance and increases sleepiness. Stay hydrated with water, which has been shown to reduce headaches and fatigue and improve mental alertness.

Eating patterns

Eat your main meal before going to work. Research suggests some benefits related to eating breakfast, regular meals throughout the day, and nutritious snacks during the night shift. When possible, take breaks to eat your snacks mindfully and with coworkers. Breaks also can include naps, which may help reduce sleepiness and fatigue and increase mental alertness.

Caffeine

Systematic reviews have demonstrated that moderate caffeine consumption can improve alertness, vigilance, and psychomotor performance; however, caffeine can interrupt sleep when night-shift workers want to rest. Because caffeine can reduce sleep efficiency, sleep duration, and slow-wave and REM sleep, consume it judiciously. Healthy adults who find that moderate caffeine consumption increases their alertness may safely continue this behavior but should limit it to one or two cups of coffee (100 to 200 mg) 30 to 60 minutes before a work shift. Avoid caffeine 4 to 6 hours before planned sleep.

What to avoid

A number of foods and substances should be avoided when working night shifts. For example, alcohol's effects are highly variable among individuals and can have an impact on functioning, alertness, and fatigue levels well beyond 24 hours. Note the effects alcohol has on you and adjust your use accordingly.

In addition, avoid high-fat and highly dense sugars and carbohydrates. These foods can have metabolic effects that make fatigue and energy swings more challenging for night-shift work.

Healthy eating patterns

Good planning and preparation can go a long way to promoting and ensuring healthy and optimal eating for nurses working night shift.

Do your grocery shopping with a list to help you focus on buying healthy foods and avoiding overly refined sugar snacks that provide quick energy but big swings. Some experts recommend gluten-free foods because gluten can sometimes cause GI distress. Prepare healthy options at the beginning of the work week and store them in baggies and containers to help make the time just before work more relaxed and reduce the likelihood you'll purchase less-healthy options from vending machines and hospital cafeterias. Having readily available healthy options also

may help you say no to sweet treats brought in by generous nurses. Depending on food storage options at your organization, consider investing in containers (such as a thermos or cooler lunchbox) that support food preservation. (See *More suggestions*.)

Make healthy choices

Nurses who work night shifts and rotating shifts may experience circadian rhythm disruptions and physiologic changes that place them at risk for health problems. Choosing nutritious food options and managing your eating patterns can help mitigate the negative effects of shift work and improve your health and well-being. AN

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References

Ayed A, Thulth AS, Sayej S. Impact of night shift and training development factors on performance of professional nurses in North West Bank governmental hospitals. *J Educ Pract.* 2015;6(27):50-60.

Bonnell EK, Huggins CE, Huggins CT, McCaffrey TA, Palermo C, Bonham MP. Influences on dietary choices during day versus night shift in shift workers: A mixed methods study. *Nutrients.* 2017;9(3):1-13.

Books C, Coody LC, Kauffman R, Abraham S. Night shift work and its health effects on nurses. *Health Care Manag.* 2017;36(4):347-53.

de Cordova PB, Bradford MA, Stone PW. Increased errors and decreased performance at night: A systematic review of the evidence concerning shift work and quality. *Work.* 2016;53(4):825-34.

Ferri P, Guadi M, Marcheselli L, Balduzzi S, Magnani D, Di Lorenzo R. The impact of shift work on the psychological and physical health of nurses in a general hospital: A comparison between rotating night shifts and day shifts. *Risk Manag Healthc Policy.* 2016;9:203-11.

Gupta CC, Centofanti S, Dorrian J, et al. Altering meal timing to improve cognitive performance during simulated nightshifts. *Chronobiol Int.* 2019;36(12):1691-1713.

Leung GKW, Huggins CE, Ware RS, Bonham MP. Time of day difference in postprandial glucose and insulin responses: Systematic review and meta-analysis of acute postprandial studies. *Chronobiol Int.* Epub ahead of print. 2019:1-16.

Pot GK. Sleep and dietary habits in the urban environment: The role of chrono-nutrition. *Proc Nutr Soc.* 2018;77(3):189-98.

Serin Y, Acar Tek N. Effect of circadian rhythm on metabolic processes and the regulation of energy balance. *Ann Nutr Metab.* 2019;74(4):322-30.

Keeping rhythm

Circadian rhythms are natural human rhythms that control many body functions. Night-shift work interferes with these normal regulatory functions, which are designed to protect and promote health, functioning, and well-being.

The basic principles underlying rhythm variations are:

- catabolism (breaking down, releasing energy) and readiness for action during the day
- anabolism (regeneration) and rest during the night.

During sleep, the body is in a fasting state that promotes the release of stored glucose for central nervous system function. Eating during this time disrupts the system.

Circadian rhythms are controlled by the brain and conduct key functions related to:

- digestion
- cell growth and repair
- immune system activity (for example, proinflammatory cytokines, such as tumor necrosis factor).

Key functions are regulated by:

- hormone (melatonin, cortisol, leptin) fluctuations
- core body temperature (peak during the day and minimum point at night).

Cortisol levels regulate the hypothalamic-pituitary-adrenal axis and are associated with increases in heart rate and blood pressure. They also increase during times of stress.

More suggestions

Other strategies for mitigating the negative effects of night-shift work include nurses supporting each other, adequate lighting, and physical activity.

Work together

- Nurses can establish eating norms and healthy food guidelines to support each other and provide accountability.
- Employers can offer healthy snack options in cafeterias and vending areas and on nursing units.
- The return on investment may include reduced turnover and absenteeism and increased productivity and satisfaction.

Follow the light

- Light affects and controls (to some extent) circadian rhythms, including hormone secretion, core body temperature, and homeostatic balance of nutrient intake, processing, and energy expenditure.
- Short-wavelength (blue) and long-wavelength (red) light increases alertness and performance at night.
- Blue light significantly suppresses melatonin.

Stay active

- Regular physical activity is strongly associated with reduced comorbidities and mortality, improved mental health, increased quality of life, and better symptom management.
- Physical activity works in concert with nutrition to produce health benefits.