



POSITION STATEMENT

Safe Work / On-Call Practices

PREAMBLE

Perioperative personnel are assigned designated times, in addition to their regular work hours, to be available on an "on-call" basis for unplanned, urgent, or emergent procedures or to provide care for patients whose procedures run past scheduled time periods. Call hours may vary from four hours to 72 hours or more. Actual hours worked during the call period are unpredictable and can range from 30 minutes to the entire length of the call period. Working sustained hours may affect safe patient care, strain existing human resources, create stress for perioperative staff members, and increase the potential for occupational injury due to prolonged work hours.

Traditionally, perioperative registered nurses have worked eight-hour shifts. Several new trends in perioperative staffing patterns include fewer but longer work days, in addition to on-call coverage.¹ Although on-call requirements may be assigned to perioperative nursing staff members on a rotating basis according to patient population, organizational needs, and demographic challenges, perioperative registered nurses may volunteer to take extra call to increase their income (eg, elective overtime). Perioperative registered nurses also may be directed to work beyond their scheduled work/call shift to augment staffing requirements, meet unexpected patient needs, or satisfy organizational expectations (eg, mandatory overtime). These new trends in staffing, other social and economic factors, and on-call hours have converged to create hazardous conditions that jeopardize patient and employee safety. Current research trending the number of hours worked per day by perioperative registered nurses is lacking. Anecdotal reports suggest perioperative staff nurses are working longer hours with fewer breaks and often inadequate time for rest between shifts.² Twenty-four hour call shifts are becoming more common.³

A large body of research exists about fatigue and sleep deprivation and their effect on performance. Research also describes the influence of circadian rhythms on alertness.⁴ Sustained work hours and prolonged periods of wakefulness are among working conditions that may have a negative effect on human performance.⁴⁻⁸ It has been reported that 17 hours without sleep can adversely affect performance to the equivalent of a blood alcohol concentration of 0.05%.¹ At 24 hours without sleep, performance degradation is equivalent to a blood alcohol concentration of 0.10%.⁷ Definitions of intoxication are set by individual states and range from 0.08% to 0.10% blood alcohol concentration.⁹ Current research identifies a relationship between preexisting fatigue, total number of hours worked, task intensity, and extended work periods, which exacerbate fatigue and increase the potential for error.⁴

Research also suggests that work periods of 12 hours or more are associated with a higher probability of making an error and an increase in risk-taking behaviors. For some cognitive tasks, peak performance is achieved at about five hours and then declines to its lowest levels after 12 to 16 hours.⁴ Researchers have further established a link between working extended hours and medical error rates. According to studies, the medical error rate tripled after workers performed 12.5 hours of sustained activity.^{3,6} Moreover, research has identified medication,

procedural, documentation, and transcription errors as occurring more frequently as work hours increase.^{3,10} Studies suggest a correlation between sleep deprivation and negative effects on memory, language/numeric skills, visual attention, and concentration.¹¹⁻¹³ In addition to creating a risk to patient safety, research reveals that sleep-deprived, fatigued people are at increased risk for personal injury on duty and when driving home after an extended work day.^{6,14,15}

There is a consistent body of research demonstrating that most people require a minimum of eight hours of uninterrupted sleep per night to achieve normal levels of alertness during daytime hours. Although evidence indicates that reducing the sleep period by one hour may have little effect on alertness and performance if an individual is well-rested, reduced sleep when accompanied by an existing sleep debt diminishes performance and the ability of an individual to remain alert.⁴ The literature indicates 10-hour, off-duty rest periods may not be sufficient to support an eight-hour sleep opportunity. To promote adequate sleep cycles of seven to eight hours, studies indicate optimal time between shift periods should be 16 hours.^{4,16-18}

Self-assessment of fatigue often is inaccurate, with fatigue being underestimated. A noted discrepancy exists between subjective self-reports and psychophysiological measures. Impaired self-discernment of cognitive ability increases as sleep loss and fatigue increase. Higher-order cognitive brain functions and the ability to evaluate personal performance diminish as fatigue increases and sleep cycles shorten.⁴ Environmental factors may contribute to masking perceptions of sleepiness and include, but are not limited to, noise, physical activity, nicotine, caffeine, thirst, hunger, excitement, and talking about something interesting. These behaviors, when used in an attempt to overcome sleepiness and/or exhaustion, also may contribute to escalations in fatigue.¹⁹

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AORN believes that on-call staffing plans should be based on strategies that minimize extended work hours, allow for adequate recuperation, and retain the perioperative registered nurse as circulator. AORN is committed to both patient and worker safety. AORN recognizes that research addressing sleep deprivation, fatigue, and patient outcomes related directly to perioperative nursing practice is limited. Human factors implications and evidence from existing research in other safety-sensitive industries (eg, medicine, the military, aviation) have significant implications in the development of perioperative work plans, including on-call schedules.

- Recognizing the potential negative consequences of sleep deprivation and sustained work hours and further recognizing that adequate rest and recuperation periods are essential to patient and perioperative personnel safety, AORN suggests the following strategies.
- Perioperative registered nurses should not be required to work in direct patient care for more than 12 consecutive hours in a 24-hour period and not more than 60 hours in a seven-day period. Sufficient transition time is required for appropriate patient handoff and staff relief. Under extreme conditions exceptions to the 12-hour limit may be required (eg, disasters). Organization policy should outline exceptions to the 12-hour limitation. All worked hours (ie, regular hours and call hours worked) should be included in calculating total hours worked.^{7,10,18}
- Off-duty periods should be inclusive of an uninterrupted eight-hour sleep cycle, a break from continuous professional responsibilities, and time to perform individual activities of daily living.^{2,3,20}

- Arrangements should be made, in relation to the hours worked, to relieve a perioperative registered nurse who has worked on-call during his or her off shift and who is scheduled to work the following shift to accommodate an adequate off-duty recuperation period.
- The number of on-call shifts assigned in a seven-day period depends on the type of facility and should be coordinated with the number of sustained work hours and adequate recuperation periods mentioned above.
- An individual's ability to meet the anticipated work demand should be considered for on-call requirements. Limited research indicates older people are more likely than younger people to be adversely affected by sleep deprivation; however, there is no research specific to the effects of on-call assignment and a person's age.
- Orientation to on-call should be included in the orientation process and should be accomplished using the preceptor system (ie, having an experienced nurse serve as an immediate resource for the orientee). The time frame depends on the type of procedures and the scope of services.
- Perioperative registered nurses should uphold their ethical responsibility to patients and themselves to arrive at work adequately rested and prepared for duty.^{10,21}
- Health care organizations should support perioperative RNs in changing cultural attitudes so that fatigue is recognized as an unacceptable risk to patient and worker safety rather than a sign of a worker's dedication to the job.¹⁰

This position statement articulates AORN's position regarding on-call practices for perioperative registered nurses based on available research at this time. It is the responsibility of each facility to determine its specific on-call policies and procedures based on patient need and available resources.

GLOSSARY

On-call: A designated period of time, outside of designated hours of operation, during which perioperative RNs and other perioperative personnel are available to respond to patient care needs for unplanned circumstances or urgent or emergent procedures.

Call hours worked: This is the actual time the on-call perioperative registered nurse and other perioperative personnel are called in to the facility for a procedure.

Extended work period: Work schedules having a longer than normal workday; however, there is no clear consensus nor are there regulations about the length of the extended workday. Some sources regard time worked in excess of eight hours to be extended work periods, while others consider shifts longer than 12 hours to be extended shifts.^{22,23}

Sustained work hours: Work periods of 12 or more hours with limited opportunity for rest and no opportunity for sleep.⁸

Off duty: A period of uninterrupted time during which an individual is free from work-related duties.²⁰

Sleepiness: A physiological state. Deprivation or restriction of sleep increases sleepiness. Just as hunger and thirst are reversible by eating or drinking, respectively, sleep reverses sleepiness.⁴

Fatigue: A response to predefined conditions that has physiological and performance consequences. Fatigue is identified as deterioration in human performance arising as a consequence of changes in the physiological condition. Factors contributing to fatigue include,

but may not be limited to, time on task, time and duty period duration, time since awake when beginning the duty period, acute and chronic sleep debt, circadian disruption, multiple time zones, and shift work.⁴

Circadian rhythms: Twenty-four-hour cycles of behavior and physiology generated by an internal biological clock located in the suprachiasmatic nuclei of the hypothalamus. It regulates the daily cyclical patterns of sleep and wakefulness. It compels the body to fall asleep and wake up and regulates hour-to-hour waking behavior reflected in fatigue, alertness, and cognitive performance.²⁴

REFERENCES

1. Board on Health Care Services, Institute of Medicine, "Keeping patients safe: Transforming the work environment of nurses," National Academies Press, <http://www.nap.edu/openbook/0309090679/html/1.html> (accessed 10 Dec 2004).
2. A Page, "Appendix C: Work hour regulation in safety-sensitive industries," in *Keeping Patients Safe: Transforming the Work Environment of Nurses* (Washington, DC: National Academies Press, 2004) 384-435.
3. A E Rogers et al, "The working hours of hospital staff nurses and patient safety," *Health Affairs* 23 (July/August 2004) 202-212.
4. Battelle Memorial Institute, JIL Information Systems "An overview of the scientific literature concerning fatigue, sleep, and the circadian cycle" (January 1998), Federal Aviation Administration, <http://cf.alpa.org/internet/projects/ftdt/backgr/batelle.htm> (accessed 10 Dec 2004).
5. "The effect of health care working conditions on patient safety," *Evidence Report: Technology Assessment* 74 (March 2003) 1-3.
6. M R Rosekind et al, "Managing fatigue in operational settings 1: Physiological considerations and countermeasures," *Hospital Topics* 75 (Summer 1997) 23-30.
7. M Rosekind et al, "Managing fatigue in operational settings 2: An integrated approach," *Hospital Topics* 75 (Summer 1997) 31-35.
8. G P Kruger, "Sustained work, fatigue, sleep loss and performance: A review of the issues," *Work and Stress* 3 no 2 (1989) 129-141.
9. A Page, "Executive summary," in *Keeping Patients Safe: Transforming the Work Environment of Nurses* (Washington, DC: National Academies Press, 2004) 6.
10. D M Gaba, S K Howard, "Patient safety: Fatigue among clinicians and the safety of patients," *The New England Journal of Medicine* 347 (Oct 17, 2002) 1249-1255.
11. R P Hart et al, "Effect of sleep deprivation on first-year residents' response times, memory, and mood," *Journal of Medical Education* 62 (November 1987) 940-942.
12. R Rubin et al, "Neurobehavioral effects of the on-call experience in house staff physicians," *Journal of Occupational Medicine* 33 (January 1991) 13-18.
13. J Robbins, F Gottlieb, "Sleep deprivation and cognitive testing in internal medicine house staff," *Western Journal of Medicine* 152 (January 1990) 82-86.

14. A Gurjala et al "Petition to the Occupational Safety and Health Administration requesting that limits be placed on hours worked by medical residents (HRG publication #1570)," (April 30, 2001) Public Citizen, <http://www.citizen.org/publications/release.cfm?ID=6771> (accessed 10 Dec 2004).
15. R G Hughes, A E Rogers, "Are you tired?" *American Journal of Nursing* 104 (March 2004) 36-38.
16. N Kurumatani et al, "The effects of frequently rotating shiftwork on sleep and the family life of hospital nurses," *Ergonomics* 37 (June 1994) 995-1007.
17. G Kecklund, T Akerstedt, "Effects of timing of shifts on sleepiness and sleep duration," *Journal of Sleep Research* 4 no 2 (1995) 47-50.
18. A Page, "Work and workspace design to prevent and mitigate errors," in *Keeping Patients Safe: Transforming the Work Environment of Nurses* (Washington, DC: National Academies Press, 2004) 237.
19. S R Mohler, "Fatigue in aviation activities," *Aerospace Medicine* 37 (July 1966) 722-732.
20. D F Dinges et al, "Principles and guidelines for duty and rest scheduling in commercial aviation," *Human Factors Research and Technology*, <http://humanfactors.arc.nasa.gov/zteam/fcp/pubs/p.and.g.intro.html> (accessed 10 Dec 2004).
21. "AORN explications for perioperative nursing," in *Standards, Recommended Practices, and Guidelines* (Denver: AORN, Inc, 2004) 53-83.
22. "Extended/unusual work shifts," US Department of Labor, Occupational Safety and Health Administration, <http://www.osha.gov/SLTC/emergencypreparedness/guide/extended.html> (accessed 10 Dec 2004).
23. "OSH answers," Canadian Center for Occupational Health and Safety, http://www.ccohs.ca/oshanswers/work_schedules/workday.html (accessed 10 Dec 2004).
24. M H Kryger, T Roth, W C Dement, eds, *Principles and Practice of Sleep Medicine*, third ed (Philadelphia: W B Saunders Co, 2000) 319, 334.

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