Emergency Nurse Duty Hours and Safety

Position Statement

EMERGENCY NURSES ASSOCIATION

Emergency Nurses Association
930 E. Woodfield Road
Schaumburg, IL 60173
847-460-4000
enau@ena.org
www.ena.org

This position statement, including the information and recommendations set forth herein, reflects ENA's current position with respect to the subject matter discussed herein based on current knowledge at the time of publication. This position statement is only current as of its publication date and is subject to change without notice as new information and advances emerge. The positions, information, and recommendations discussed herein are not codified into law or regulations. In addition, variations in practice that take into account the needs of the individual patient and the resources and limitations unique to the institution may warrant approaches, treatments, and/or procedures that differ from the recommendations outlined in this position statement. Therefore, this position statement should not be construed as dictating an exclusive course of management, treatment, or care, nor does adherence to this position statement guarantee a particular outcome. ENA's position statements are never intended to replace a practitioner's best nursing judgment based on the clinical circumstances of a particular patient or patient population. Position statements are published by ENA for educational and informational purposes only, and ENA does not "approve" or "endorse" any specific sources of information referenced herein. ENA assumes no liability for any injury and/or damage to persons or property arising out of or related to the use of or reliance on any position statement.

How to Reference This Document

Proehl, J. A., & Bradford, J. (2025). *Emergency nurse duty hours and safety* [Position statement]. Emergency Nurses Association. https://enau.ena.org/URL/EmergencyNurseDutyHoursandSafetyPositionStatement

Editorial and Production Credits

Chief Clinical Officer: Brad Goettl, DNP, DHA, FNP-C, AGACNP-BC, ENP-C, CEN, FAANP, FAAN, FAEN, FACHE
Director, Emergency Nursing Practice Excellence: Catherine Olson, MSN, RN
Senior Director, Branding, Creative, and Events: Denise Wawrzyniak, MA
Director, Learning Design and Experiences: Ken Loredo, BA
Practice Excellence Specialist: Domenique Johnson, RN, MSN
Senior Administrative Assistant: Kathy Loconti
Senior Developmental Editor: Chris Zahn, PhD
Learning Management System Specialist: Monika Baldan, BA

Acknowledgements

The authors gratefully acknowledge the assistance of Kathy Robinson, RN, BS, FAEN for her expert review and comments during the revision of this position statement.

Authored by

Jean A. Proehl, MN, RN, CEN, CPEN, TCRN, FAEN, FAAN
Judith Bradford, DNS, MSN, RN, FAEN

Reviewed by

2024 ENA Position Statement Committee Members

Dawn Peta, BN, RN, ENC(C), Chairperson
Elizabeth Stone, PhD, MSN, RN, CPEN, FAEN
Kimberly Austin, MSN, RN, CPEN, SANE-P, TCRN
Joanne E. Navarroli, MSN, RN, CEN
Nancy J. Denke, DNP, ACNP-BC, FNP-BC, FAEN, CEN, CCRN
Sharon Carrasco, DNP, RN, APRN, NP, CNS, CEN, ACNS-BC, NP-C, FAEN, FAAN
Kristie Gallagher, DNP, RN, EMT-P, CEN, CPEN, NREMT-P, TCRN, FAEN

2024 ENA Board of Directors Liaison

Chris Parker, MSN, RN, CEN, CPEN, CFRN, CNL, NRP, TCRN

2024 ENA Staff Liaison

Domenique Johnson, MSN, RN

Developed: June 2018

Approved by the ENA Board of Directors: 2018
Revised and Approved by the ENA Board of Directors: March 2019
Revised and Approved by the ENA Board of Directors: 2024

Emergency Nurse Duty Hours and Safety

Description

Globally, emergency nurses work a variety of schedules, including rotations between daylight and darkness and a range of time intervals. It is not uncommon for nurses to work for multiple employers, attend school, and have family or childcare responsibilities. Despite copious evidence about the deleterious effects of fatigue, nurses often consider it "part of the job" and regard themselves as "supernurses" who are immune to the risks to themselves and their patients (Steege & Rainbow, 2017). While the number of hours worked and rest periods between shifts are federally regulated for industries such as airline pilots, truck drivers, and railroad workers in the U.S. (Occupational Safety and Health Administration [OSHA], n.d.-a, Limitations on Work Hours), the healthcare arena has been slow to adopt similar regulations. The European Union has very specific regulations on hours worked per week, hours at night, time off during the year, and medical screenings for night shift workers (European Union, 2024). In the U.S., some states have laws limiting nursing overtime and work hours, but there are no federal laws or regulations in this regard (Nurse Overtime and Patient Safety Act of 2024, 2024; OSHA, n.d.-a, Limitation on Work Hours). Most U.S. hospitals have transitioned to 12-hour shifts for nurses, yet OSHA defines more than eight hours as an "extended shift" (OSHA, n.d.-a). There are factors in addition to shift length and time off between shifts that contribute to fatigue, such as night shift hours, total hours worked, commute time, and personal activities (Gander et al., 2020; Gurubhagavatula et al., 2021; James et al., 2020).

Appropriate emergency nurse staffing is critical to ensuring the delivery of safe, quality care. However, the solution to staffing issues is not simply increasing the number of hours worked (American Nurses Association, 2020). It is well documented in the literature that longer shifts correlate with higher levels of staff burnout and fatigue, and nurses' shift length is significantly associated with both patient and employee satisfaction (Bae, 2021; Caruso et al., 2019; Cho & Steege, 2021).

Fatigue decreases a nurses' ability to respond to patient situations in an effective manner, with deviations from standards of practice contributing to procedural errors (Bae, 2021). Even more notable is the relationship between nurses' shift length and nurse-reported quality and safety measures (Caruso et al., 2019; Stimpfel et al., 2012). Burnout and job dissatisfaction are more than two and a half times higher in nurses working shifts over eight hours (Stimpfel et al., 2012). The unpredictable patient load and acuity in emergency care settings leads to environmental turbulence, which is both mentally and physically taxing. This places emergency nurses at risk for physical and mental fatigue, burnout, and errors. In addition, high work demands impair the ability to recover from fatigue (Gifkins et al., 2020). Fatigue can take many forms, such as fatigue from lack of rest and/or meal periods during a shift or fatigue from the stress of the job, which can lead to compassion fatigue. Compassion fatigue can have deleterious consequences that directly impact patient safety and satisfaction as well as the nurses' own health (Emergency Nurses Association, 2020).

ENA Position

It is the position of the Emergency Nurses Association (ENA) that

1. It is the responsibility of the emergency nurse to self-monitor and ensure adequate rest between scheduled work assignments and to prioritize sleep.

2. It is optimal for an emergency nurse to not work a shift longer than eight hours, with a minimum of ten hours off between shifts.

3. Factors such as night shift hours, total hours worked, commute time, and others are considered, in addition to maximum shift length and minimum time off between shifts, when attempting to mitigate adverse health effects and fatigue-related risks.

4. Emergency nurses and employers collaborate to implement strategies to prevent and mitigate fatigue.

5. Employers staff accordingly to avoid unstaffed shifts, open shifts, extended shifts, or overtime that would extend a nurse past 12 consecutive hours of work or 12 hours of work in a 24-hour period.

6. Mandatory overtime is an unacceptable and unsafe approach to achieving appropriate staffing levels.

7. Employers and nurses acknowledge the importance of well-rested personnel through the implementation of evidence-based fatigue risk management strategies.

8. Emergency nurses participate in the development of policies and procedures, including scheduling practices and work practices that contribute to a safe, effective, and healthy work environment.

9. ENA supports *ANA's Principles for Nurse Staffing*.

Background

It is imperative that emergency nurses remain alert in order to provide safe care, and it is vital that emergency nurses recognize changes in patient conditions, initiate appropriate and timely interventions, and prevent potentially dangerous errors in medication and procedural orders. Fatigue and sleep deprivation are linked to decreased attentiveness, memory, information processing, reaction time, and effectiveness of decision-making. Unfortunately, nurses cannot accurately assess their own level of fatigue (Cochran et al., 2021; Wilson et al., 2019). Nurses also downplay the significance of fatigue on their performance (Steege & Rainbow, 2017). Thus, it is important that emergency nurses, as well as employers, understand the importance of well-rested personnel and include regular education on the effects of fatigue on patient safety, nurses' mental health, and nurses' well-being as part of establishing and maintaining a healthy work environment.

Factors related to adequate rest include the amount of rest, the time rest occurs, the quality of rest, and the neurobiological pressure to sleep (Gurubhagavatula et al., 2021). Adverse events such as needlestick injuries and errors increase with the impaired cognitive function associated with long hours, night shift work, and minimum rest between shifts (Clendon & Gibbons, 2015; James et al., 2020; Lo et al., 2016).

The 12-hour shifts worked by many emergency nurses are associated with frequent overtime, difficulties staying awake on duty, reduced sleep times, and increased risk for error (McElroy et al., 2020; Wilson et al., 2019). Involuntary overtime or overtime agreed to by nurses because of coercion or a sense of duty contributes to nurses working when exhausted, poor work-life balance, and increased turnover (Karhula et al., 2020; Nogues & Tremblay, 2023; Watanabe & Yamauchi, 2019). Nurses working 12-hour shifts sleep less and experience less efficacious sleep when compared to nurses working 8-hour shifts (Rhéaume & Mullen, 2017). Nurses working extended shifts and long hours—more than 40 hours a week with insufficient sleep—are at greater risk for making errors (Bae, 2021; Caruso et al., 2019; Son et al., 2019) than those working regular hours. These errors can be related to medication administration, omission of care, or failure to rescue (Wilson et al., 2019).

Evidence shows that staying awake for 17 hours is functionally equivalent to having a blood alcohol concentration (BAC) of 0.05%, and staying awake for 24 hours equates to a BAC of 0.10% (Williamson & Feyer, 2000). One study found that sleep loss had a more potent sedative effect than alcohol ingestion, with comparable psychomotor impairment (Roehrs et al., 2003).

Extended hours can also result in the nurse falling asleep while driving, which endangers the nurse and others (Caruso et al., 2019; Gander et al., 2020; McElroy et al., 2020; Smith et al., 2020). Extended hours increase the probability of burnout, which can lead to leaving the emergency department or the nursing profession entirely (Stimpfel et al., 2012). Working chronic extended hours can cause compassion fatigue, which results in a lack of empathy for patients and decreased patient satisfaction (ENA, 2020).

There is evidence of a direct relationship between working more than 12 hours at a time or more than 40 hours in a week and nurses' health (Rodriguez Santana et al., 2020; Son et al., 2019). Working the night shift can cause circadian discordance, resulting in alterations in insulin regulation and inflammation-related proteins, which could lead to chronic health problems such as diabetes and obesity (McDermott et al., 2024). Shift work during hours when biological sleep would normally occur, as well as longer work hours, increases the risk for chronic fatigue and reduced job performance and contributes to obesity, injuries, and a wide range of chronic diseases (Caruso et al., 2019; Gurubhagavatula et al., 2021; McElroy et al., 2020; Rainbow et al., 2024; Rittenschober-Bohm et al., 2020; Zhang et al., 2020). In one study, nurses working 12-hour night shifts had predicted cognitive ineffectiveness in the elevated risk zone by the 8th hour of their shift and in the high-risk zone, equivalent to a blood alcohol concentration greater than 0.08, by the end of their shift (James et al., 2020).

Fatigue and exhaustion are issues for nurses of all ages who work extended hours. However, older nurses may choose to change jobs, retire earlier, and be less likely to return to per diem positions if the only choice is 12-hour shifts (Suter et al., 2020). The loss of these nurses from the workforce exacerbates the nursing shortage and contributes to the loss of experienced and knowledgeable nurses.

It is important for healthcare leaders to work with nurses to ensure that measures are in place to facilitate adequate rest between shifts, provide meal breaks and rest periods, and address the underlying causes of extended shifts and inadequate staffing. Nurses with more input and control of their work schedule can better recover from fatigue (Gifkins et al., 2020). Countermeasures can reduce, but not eliminate, fatigue-related adverse outcomes (Gurubhagavatula et al., 2021). These include adjusting shift schedules; napping; caffeine use; sleep hygiene, including treatment of sleep disorders; medications to promote wakefulness and sleep; exposure to bright or blue light; exercise and activity breaks; mind-body interventions; sleep hygiene education; and fatigue prediction, detection, and warning technologies (Gurubhagavatula et al., 2021; Patterson et al., 2018a; Son et al. 2019; Tout et al., 2024).

Evidence-based guidelines created for fatigue mitigation in emergency medical services (EMS) providers defined the population of interest as "…shift workers whose job activity requires multiple episodes of intense concentration and attention to detail per shift, with serious adverse consequences potentially resulting from lapses in concentration" (Patterson et al., 2018b, p. 10) and specifically identified nurses as a similar worker group. While there are differences in working conditions between EMS and hospital-based emergency nurses, some of the same strategies can be used by both populations. These include using fatigue/sleepiness survey instruments to assess fatigue, access to caffeine, the opportunity to nap while on duty, and education about fatigue-related risks and fatigue mitigation (Patterson et al., 2018a). Nurses are not typically allowed to nap on duty, yet napping has been shown to decrease acute fatigue and improve performance and information processing (Martin-Gill et al., 2018; Querstret et al., 2020).

Awareness and acknowledgment of the deleterious effects of fatigue are key to changing the professional culture leading nurses to work when fatigued and decline opportunities for rest (Steege & Rainbow, 2017). Education regarding the deleterious effects of fatigue and sleep deprivation, along with countermeasures to manage fatigue are essential (Barger et al., 2018; Caruso et al., 2024; Patterson et al., 2018a; Smith et al., 2020). There is a freely available online educational program specific to nurses who work shifts and long hours (Caruso et al., 2024).

It is imperative that emergency nurses work collaboratively with leadership to explore ways to combat the negative effects of fatigue. Improving work environments requires changing professional and organizational culture. To mitigate the adverse consequences of fatigue, emergency nurses and leaders

need to be proactive not only in combating fatigue but also in acknowledging its effects on patient safety and the health of nursing staff. They also need to be working collaboratively to initiate strategies to improve staffing and nurses' health (Cochran et al., 2021; Son et al., 2019). Healthcare facilities need to evaluate practices and policies and invest in the well-being of their nursing staff, and this includes providing options for rest along with education about fatigue risks and mitigation strategies (Martin-Gill et al., 2018; Patterson et al., 2018a; Smith et al., 2020).

Resources

American Nurses Association. (2020). *ANA's principles for nurse staffing* (3rd ed.). https://cdn2.hubspot.net/hubfs/4850206/PNS3E_ePDF.pdf

Caruso, C. C., Baldwin, C. M., Berger, A., Chasens, E. R., Edmonson, J. C., Gobel, B. H., Landis, C. A., Patrician, P. A., Redeker, N. S., Scott, L. D., Todero, C., Trinkoff, A., & Tucker, S. (2019). Policy brief: Nurse fatigue, sleep, and health, and ensuring patient and public safety. *Nursing Outlook*, *67*(5), 615-619. https://doi.org/10.1016/j.outlook.2019.08.004

Caruso, C. C., Geiger-Brown, J., Takahashi, M., Trinkoff, A., Nakata, A., (2024, April). *NIOSH training for nurses on shift work and long work hours* [Course] (Publication No. 2015-11). U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. https://doi.org/10.26616/NIOSHPUB2015115revised102023

Gander, P., O'Keeffe, K., Santos-Fernandez, E., Huntington, A., Walker, L., & Willis, J. (2020). Development and evaluation of a matrix for assessing fatigue-related risk, derived from a national survey of nurses' work patterns. *International Journal of Nursing Studies*, *112*, Article 103573. https://doi.org/10.1016/j.ijnurstu.2020.103573

Gurubhagavatula, I., Barger, L. K., Barnes, C. M., Basner, M., Boivin, D. B., Dawson, D., Drake, C. L., E Flynn-Evans, E. E., Mysliwiec, V., Patterson, P. D., Reid, K. J., Samuels, C., Shattuck, N. L., Kazmi, U., Carandang, G., Carandang, G., Heald, J. L., & Van Dongen, H. P. A. (2021). Guiding principles for determining work shift duration and addressing the effects of work shift duration on performance, safety, and health: Guidance from the American Academy of Sleep Medicine and the Sleep Research Society. *Journal of Sleep Medicine*, *17*(11), 2283–2306. https://doi.org/10.5664/jcsm.9512

Patterson, P. D., Higgins, J. S., Van Dongen, H. P., Buysse, D. J., Thackery, R. W., Kupas, D. F., Becker, D. S., Dean, B. E., Lindbeck, G. H., Guyetter, F. X., Penner, J. H., Violanti, J. M., Lang, E. S., & Martin-Gill, C. (2018). Evidence-based guidelines for fatigue risk management in emergency medical services. *Prehospital Emergency Care*, *22*(Supl.1), 89–101. https://doi.org/10.1080/10903127.2017.1376137

Tout, A. F., Tang, N. K., Sletten, T. L., Toro, C. T., Kershaw, C., Meyer, C., Rajaratnam, S. M. W., & Moukhtarian, T. R. (2024). Current sleep interventions for shift workers: A mini review to shape a new preventative, multicomponent sleep management programme. *Frontiers in Sleep*, *3*, Article 1343393. https://doi.org/10.3389/frle.2024.1343393

References

American Nurses Association. (2020). *ANA's principles for nurse staffing* (3rd ed). https://cdn2.hubspot.net/hubfs/4850206/PNS3E_ePDF.pdf

Bae, S-H. (2021). Relationships between comprehensive characteristics of nurse work schedules and adverse patient outcomes: A systematic literature review. *Journal of Clinical Nursing*, 30(15-16), 2202–2021. https://doi.org/10.1111/jocn.15728

Barger, L. K., Runyon, M. S., Renn, M. L., Moore, C. G., Weiss, P. M., Condle, J. P., Flickinger, K. L., Divecha, A. A.,

Coppler, P. J., Sequira, D. J., Lang, E. S., Higgins, J. S., & Patterson, P. D. (2018). Effect of fatigue training on safety, fatigue, and sleep in emergency medical services personnel and other shift workers: A systematic review and meta-analysis. *Prehospital Emergency Care*, *22*(Supl. 1), 58–68. https://doi.org/10.1080/10903127.2017.1362087

Caruso, C. C., Baldwin, C. M., Berger, A., Chasens, E. R., Edmonson, J. C., Gobel, B. H., Landis, C. A., Patrician, P. A., Redeker, N. S., Scott, L. D., Todero, C., Trinkoff, A., & Tucker, S. (2019). Policy brief: Nurse fatigue, sleep, and health, and ensuring patient and public safety. *Nursing Outlook*, *67*(5), 615–619. https://doi.org/10.1016/j.outlook.2019.08.004

Cho, H., & Steege, L. (2021). Nurse fatigue and nurse, patient safety, and organizational outcomes: A systematic review. *Western Journal of Nursing Research*, *43*(12), 1157–1168. https://doi.org/10.1177/0193945921990892

Clendon, J. G., & Gibbons, V. (2015). Twelve-hour shifts and rates of error among nurses: A systematic review. *International Journal of Nursing Studies*, 52(7), 1231–1242. https://doi.org/10.1016/j.ijnurstu.2015.03.011

Cochran, K. R., Letvak, S. A., McCoy, T. P., Bacon, C., & Karper, W. B. (2021). Can nurses self-assess fatigue? Implications for nurse leaders. *Journal of Nursing Administration*, *51*(10), 507–512. https://doi.org/10.1097/NNA.0000000000001055

Emergency Nurses Association. (2020). *Compassion fatigue.* [Topic brief.] https://enau.ena.org/URL/Compassion-Fatigue-Topic-Brief

European Union. (2024, April 1). *Working hours*. https://europa.eu/youreurope/business/human-resources/working-hours-holiday-leave/working-hours/index_en.htm

Gander, P., O'Keeffe, K., Santos-Fernandez, E., Huntington, A., Walker, L., & Willis, J. (2020). Development and evaluation of a matrix for assessing fatigue-related risk, derived from a national survey of nurses' work patterns. *International Journal of Nursing Studies*, *112*, Article 103573. https://doi.org/10.1016/j.ijnurstu.2020.103573

Gifkins, J., Johnston, A., Loudoun, R, Troth, A. (2020). Fatigue and recovery in shift-working nurses: A scoping literature review. *International Journal of Nursing Studies 112*, Article 103710. https://doi.org/10.1016/j.ijnurstu.2020.103710

Gurubhagavatula, I., Barger, L. K., Barnes, C. M., Basner, M., Boivin, D. B., Dawson, D., Drake, C. L., E Flynn-Evans, E. E., Mysliwiec, V., Patterson, P. D., Reid, K. J., Samuels, C., Shattuck, N. L., Kazmi, U., Carandang, G., Carandang, G., Heald, J. L., & Van Dongen, H. P. A. (2021). Guiding principles for determining work shift duration and addressing the effects of work shift duration on performance, safety, and health: Guidance from the American Academy of Sleep Medicine and the Sleep Research Society. *Journal of Sleep Medicine*, *17*(11), 2283–2306. https://doi.org/10.5664/jcsm.9512

James, L., James, S. M., Wilson, M., Brown, N., Dotson, E. J., Edwards, C. D., & Butterfield, P. (2020). Sleep health and predicted cognitive effectiveness of nurses working 12-hour shifts: An observational study. *International Journal of Nursing Studies*, *112*, Article 103667. https://doi.org/10.1016/j.ijnurstu.2020.103667

Karhula, K., Turunen, J., Hakola, T., Ojajärvi, A., Puttonen, S., Ropponen, A., Kivimäki, M., & Härmä, M. (2020). The effects of using participatory working time scheduling software on working hour characteristics and wellbeing: A quasi-experimental study of irregular shift work. *International Journal of Nursing Studies*, *112*, Article 103696. https://doi.org/10.1016/j.ijnurstu.2020.103696

Lo, W. Y., Chiou, S. T., Huang, N., & Chien, L. Y. (2016). Long work hours and chronic insomnia are associated with needlestick and sharps injuries among hospital nurses in Taiwan: A national survey. *International Journal of Nursing Studies*, *64*, 130–136. https://doi.org/10.1016/j.ijnurstu.2016.10.007

Martin-Gill, C., Barger, L. K., Moore, C. G., Higgins, J. S., Teasley, E. M., Weiss, P. M., Condle, J. P., Flickinger, K. L., Coppler, P. J., Sequeira, D. J., Divecha, A. A., Matthews, M., Lang, E. S., & Patterson, P. D. (2018). Effects of napping during shift work on sleepiness and performance in emergency medical services personnel and similar shift workers: A systematic review and meta-analysis. *Prehospital Emergency Care*, *22*(Supl.1), 47–57. https://doi.org/10.1080/10903127.2017.1376136

McDermott, J. E., Jacobs, J. M., Merrill, N. J., Mitchell, H. D., Arshad, O. A., McClure, R., Teeguarden, J., Gajula, R. P., Porter, K. I., Satterfield, B. C., Lundholm, K. R., Skene, D. J., Gaddameedhi, S., & Van Dongen, H. P. A. (2024). Molecular-level dysregulation of insulin pathways and inflammatory processes in peripheral blood mononuclear cells by circadian misalignment. *Journal of Proteome Research*, *23*(5), 1547–1558. https://doi.org/10.1021/acs.jproteome.3c00418

McElroy, S. F., Olney, A., Hunt, C., & Glennon, C. (2020). Shift work and hospital employees: A descriptive multi-site study. *International Journal of Nursing Studies*, *112*, Article 103746. https://doi.org/10.1016/j.ijnurstu.2020.103746

Nogues, S., & Tremblay, D. G. (2023). From chosen to forced: A qualitative exploration of nurses' experiences with overtime. *Employee Responsibilities and Rights Journal*, 1–25. https://doi.org/10.1007/s10672-023-09485-y

Nurse Overtime and Patient Safety Act of 2024, H.R. 7546, 118th Cong. (2024). https://www.congress.gov/bill/118th-congress/house-bill/7546/text

Occupational Safety and Health Administration. (n.d.-a). *Long work hours, extended or irregular shifts, and worker fatigue*. https://www.osha.gov/worker-fatigue/limitations

Patterson, P. D., Higgins, J. S., Van Dongen, H. P., Buysse, D. J., Thackery, R. W., Kupas, D. F., Becker, D. S., Dean, B. E., Lindbeck, G. H., Guyetter, F. X., Penner, J. H., Violanti, J. M., Lang, E. S., & Martin-Gill, C. (2018a). Evidence-based guidelines for fatigue risk management in emergency medical services. *Prehospital Emergency Care*, *22*(Supl. 1), 89–101. https://doi.org/10.1080/10903127.2017.1376137

Patterson, P. D., Higgins, J. S., Weiss, P. M., Lang, E., & Martin-Gill, C. (2018b). Systematic review methodology for the fatigue in Emergency Medical Services Project. *Prehospital Emergency Care*, 22(Supl. 1), 9–16. https://doi.org/10.1080/10903127.2017.1380096

Querstret, D., O'Brien, K., Skene, D.J., & Maben, J. (2020). Improving fatigue risk management in healthcare: A systematic scoping review of sleep-related/fatigue-management interventions for nurses and midwives. *International Journal of Nursing Studies*, *106*, Article 103513. https://doi.org/10.1016/j.ijnurstu.2019.103513

Rainbow, J., Dudding, K., Bethel, C., Norton, A., Platt, C., Vyas, P., & Slebodnik, M. (2024). Work-related health conditions among American nurses: A scoping review. *SAGE Open Nursing*, *10*. https://doi.org/10.1177/23779608241257026

Rhéaume, A., & Mullen, J. (2018). The impact of long work hours and shift work on cognitive errors in nurses. *Journal of Nursing Management*, *26*(1), 26–32. https://doi.org/10.1111/jonm.12513

Rittenschober-Bohm, J, Bibl, K., Schneider, M., Klasinc, R., Szeremy, P., Haidegger, T., Ferenci, T., Mayr, M., Berger, A., & Assadian, O. (2020). The association between shift patterns and the quality of hand antisepsis in a neonatal intensive care unit: An observational study. *International Journal of Nursing Studies*, *112*, Article 103686. https://doi.org/10.1016/j.ijnurstu.2020.103686

Rodriguez Santana, I., Anaya Montes, M., Chalkley, M., Jacobs, R., Kowalski, T., & Suter, J. (2020). The impact of extending nurse working hours on staff sickness absence: Evidence from a large mental health hospital in England. *International Journal of Nursing Studies*, *112*, Article 103611. https://doi.org/10.1016/j.ijnurstu.2020.103611

Roehrs, T., Burduvali, E., Bonahoom, A., Drake, C., & Roth, T. (2003). Ethanol and sleep loss: A "dose" comparison of impairing effects. *Sleep*, *26*(8), 981–985. https://doi.org/10.1093/sleep/26.8.981

Smith, A., McDonald, A. D., & Sasangohar, F. (2020). Night-shift nurses and drowsy driving: A qualitative study. *International Journal of Nursing Studies*, *112*, Article 103600. https://doi.org/10.1016/j.ijnurstu.2020.103600

Son, Y., Lee, E. K., & Ko, Y. (2019). Association of working hours and patient safety competencies with adverse nurse outcomes: A cross-sectional study. *International Journal of Environmental Research and Public Health*, *16*(21), Article 4083. https://doi.org/10.3390/ijerph16214083

Steege, L. M., & Rainbow, J. G. (2017). Fatigue in hospital nurses—'Supernurse culture' is a barrier to addressing problems: A qualitative interview study. *International Journal of Nursing Studies*, *67*, 20–28. https://doi.org/10.1016/j.ijnurstu.2016.11.014

Stimpfel, A. W., Sloane, D. M., & Aiken, L. H. (2012). The longer the shifts for hospital nurses, the higher the levels of burnout and patient dissatisfaction. *Health Affairs*, *31*(11), 2501–2509. https://doi.org/10.1377/hlthaff.2011.1377

Suter, J., Kowalski, T., Anaya-Montes, M., Chalkley, M., Jacobs, R., & Rodriguez-Santana, I. (2020). The impact of moving to a 12-hour shift pattern on employee wellbeing: A qualitative study in an acute mental health setting. *International Journal of Nursing Studies*, *112*, Article 103699. https://doi.org/10.1016/j.ijnurstu.2020.103699

Tout, A. F., Tang, N. K., Sletten, T. L., Toro, C. T., Kershaw, C., Meyer, C., Rajaratnam, S. M. W., & Moukhtarian, T. R. (2024). Current sleep interventions for shift workers: A mini review to shape a new preventative, multicomponent sleep management programme. *Frontiers in Sleep*, *3*, Article 1343393. https://doi.org/

10.3389/frsle.2024.1343393

Watanabe, M. & Yamauchi, K. (2019). Subtypes of overtime work and nurses' fatigue, mental status, and work engagement: A latent class analysis of Japanese hospital nurses. *Journal of Advanced Nursing*, 75, 2122–2132. https://doi.org/10.1111/jan.13991

Williamson, A., & Feyer, A.-M. (2000). Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication. *Occupational and Environmental Medicine*, 57(10), 649–655. https://doi.org/10.1136/oem.57.10.649

Wilson, M., Permito, R., English, A., Albritton, S., Coogle, C., & Van Dongen, H. P. A. (2019). Performance and sleepiness in nurses working 12-hour day shifts or night shifts in a community hospital. *Accident Analysis & Prevention*, *126*, 43–46. https://doi.org/10.1016/j.aap.2017.09.023

Zhang, Q., Chair, S. Y., Lo, S. H. S.; Chau, Janita Pak-Chun; Schwade, M., Zhao, X. (2020). Association between shift work and obesity among nurses: A systematic review and meta-analysis. *International Journal of Nursing Studies*, *112*, Article 103757. https://doi.org/10.1016/j.ijnurstu.2020.103757