



Editorial

Sleep and Wellness in Residency—Embracing the Shift

Bharati Prasad, MD, MS; Vineet M. Arora, MD, MAPP

Long and variable work hours are standard in medical residencies worldwide. This schedule often leads to sleep deprivation. Over 3 decades of research have shown that sleep deprivation decreases alertness, neurocognitive function, and mood, while increasing medical errors. In the US, the Accreditation Council for Graduate Medical Education (ACGME) eliminated shifts longer than 24 hours and limited weekly work hours to 80 in 2003. In 2011, a 16-hour limit was implemented for first-year residents but was later revoked due to a lack of empirical support.¹ Randomized clinical trials examining the effect of reduced work hours have reported increased sleep duration and alertness, which may be associated with reduced medical errors.²

The cohort study by Massar et al³ compared outcomes associated with 2 night-work schedules that spanned 24 to 30 hours vs 12 hours (night float) in 96 first-year residents from a teaching hospital in Singapore. Sleep, physical activity, cognition, well-being, and mood were assessed daily over 8 weeks using wearable sleep monitors (the Oura Ring) and smartphone applications. This study represents an advancement in the field with the use of technology for longitudinal, ecological outcome assessments with clinical validity. While the average nocturnal sleep duration was higher in the 24 hours or more group, sleep schedules and sleep quality were more regular in the night float group, which had fewer work-shift changes. The night float group demonstrated better working memory and cognition and rated their mood and motivation higher than the 24 hours or more group, even after adjusting for the preceding nightly sleep duration. These findings are limited by the variable timing of the study assessments and lack of adjustment for program or individual characteristics, such as specialty of training and chronotype. Future studies examining both specialty and chronotype are important given the unique volume needs of procedural training and chronotype, or the body's natural affinity for being either an early bird or a night owl.

Apart from the expected improvement in well-being with shorter hours, one of the most interesting results of the study from Massar et al³ emanated from analyzing naps and cognition during the 2 schedules. Regardless of which schedule an intern was on, a nap was associated with improved vigilance as measured by the 3-minute performance vigilance task (PVT), a validated test that correlates with errors and was previously used in residents.⁴ Moreover, the vigilance measure of the on-call group approached that of the post-night shift group. This finding is consistent with earlier data showing that a nap during a long shift is associated with less fatigue and approached the fatigue level before a call day.⁵ While vigilance alone may seem too reductionist a concept for the complexity of medical care, it is a construct that is important in ensuring patient safety through being watchful for errors continuously. More importantly, vigilance is required for many tasks that require sustained attention such as driving. Given the risk of drowsy driving after either night shifts or long shifts, more could be done to ensure that naps are offered and taken, especially when vigilance is impaired. Moreover, given the lack of adequate testing for sleep deprivation, the PVT could become part of fitness for duty assessment before one drives home or starts their shift. While such self-assessments and naps are part of the culture of aviation and other long-shift industries, the culture of medicine has not been as receptive to acknowledging both the limitations and evidence-based strategies to optimize human performance.

The findings of Massar et al³ align with the published evidence demonstrating a positive effect of the ACGME work regulations and reductions in work hours on trainee sleep and well-being.⁶ Massar et al³ did not measure the impact of the 2 work schedules on the education of the trainees or medical errors. Despite the benefits of the float system, it is important to acknowledge the concerns

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that restricted work hours may also reduce educational opportunities,⁷ particularly for skill-based learning in surgical specialties that are characterized by very long operative times.^{8,9} Future research should examine the role of simulation and other ways to augment clinical experience to ensure readiness to practice. Evidence regarding the effect of limiting work hours on self-reported medical errors is generally favorable, but with studies generally reporting modest to no effect on patient outcomes.¹⁰ Because limiting work hours necessitates more frequent hand offs, the increasing use of shift work should be offset by investments in safer handoffs. Although there are concerns that a move to shifts will create a shift-work mentality that would erode professionalism, there are ways to demonstrate professionalism within the context of shift work that should be emphasized.¹¹ While we are discussing training, it is important to acknowledge that the current shortage and inequitable distribution of physicians across the world means that some physicians simply don't have the luxury of limiting their hours, as they serve as the only specialist on call continuously for a region of the country. Efforts to mitigate sleep deprivation and improve alertness for practicing physicians in these areas while addressing access to care are also needed.

Overall, the study by Massar et al³ suggests that night float schedules offer stable sleep timing and adequate sleep duration with improved resident well-being and cognitive performance. In the context of the extant literature, this study also underscores the challenges in designing the optimal schedule and scope of work for resident physicians, who are both learners and physicians caring for patients at the same time. Limiting resident work hours should also be accompanied by a thoughtful exploration of how to increase the educational value of hours residents are working. For example, as the growth of artificial intelligence and technology emerges in health care, efforts should be explored to offload low educational value administrative tasks to an AI-enabled robots and chatbots to ensure residents can maximize their clinical learning and experience accrual during their designated shifts. The public and the profession demands continuous availability and high performance from health professionals to provide compassionate, quality care to patients. To meet these demands, we should continually evaluate how to best design resident schedules alongside other workforce and workload solutions to ensure that resident learning, expertise, and well-being are preserved while continuing to provide the care our patients deserve.

ARTICLE INFORMATION

Published: October 11, 2024. doi:10.1001/jamanetworkopen.2024.38294

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Corresponding Author: Vineet M. Arora, MD, University of Chicago Pritzker School of Medicine, 924 E 57th St, Ste 104, Chicago, IL 60637 (varora@uchicagomedicine.org).

Author Affiliations: Department of Medicine, University of Illinois, Chicago (Prasad); Pritzker School of Medicine, University of Chicago (Arora).

Conflict of Interest Disclosures: None reported.

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