Anesthesia Quality Institute®
American Society of Anesthesiologists®

Anesthesia Incident Reporting System (AIRS)

Case 2022-11: Workin' on the Night Shift

Because of our busy OR schedule, a complex, high-risk, scheduled surgical procedure was performed during late-night hours by surgeons and anesthesiology professionals who had been at work since early in the morning. The patient entered the OR on schedule at 7 p.m., and incision was made at 8:30 p.m. The procedure was finished at 2:45 a.m., and the patient was discharged from the PACU at 4:30 a.m., with the on-call PACU nurses taking care of him. The procedure had been scheduled to last at least five hours. While taking care of this patient, I was also medically directing two other operations that were scheduled to start late in the afternoon. (The last one of those ended at midnight.)

The impact of fatigue and burnout on patient safety has been extensively discussed in these pages, but the topic is so important that it bears additional discussion. In fact, Gravenstein, Cooper, and Orkin reported as far back as 1990 that tired anesthesiologists were more likely to commit patient care errors, and a comprehensive review of fatigue has discussed the impacts of sleep deprivation on both patient and physician safety (*Anesthesiology* 1990;72:737-42; *Anesth Analg* 2018;126:1340-8). The pressure to increase OR throughput has only increased since then, and as a result, surgical procedures often run late into the night. An article in *Becker's Hospital Review* explained how to "Make Your Assets Sweat" and suggested running the ORs "four or five" hours later than they currently do so that additional routine cases can be scheduled (asamonitor.pub/3D27eOe). This is happening even in academic centers, with production pressure affecting all aspects of patient care. A recent study laments that surgeons are spending less time teaching their residents and more time doing procedures themselves (*J Surg Educ* 2021;78:148-59). In the case described here, the anesthesiologist was asked to care for several patients whose procedures were deliberately scheduled to start late in the day and run into the wee hours of the morning.

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An anesthesia "night float" is one commonly proposed solution to accommodating surgical procedures that are done overnight. Although many industries (including medicine) use night shifts, this scheduling option comes with its own problems. Working overnight has been associated with negative health effects that include cardiovascular disease, cancer, immunosuppression, diabetes, increased risk of accidents, and premature death (*BMJ* 2016;355:i5210). One study explored the effects of working scheduled night shifts on emergency medicine nurses, residents, and faculty. In addition to expressing concerns about the health effects of working overnight, attending physicians reported lower levels of satisfaction and were more likely to fall asleep on the drive home (*Clin Exp Emerg Med* 2018;5:240-8). The effects of sleep deprivation on surgical dexterity are unclear. Manual dexterity does seem to be impaired, but other studies have found no difference in surgical performance after sleep deprivation (*National Journal of Physiology, Pharmacy and Pharmacology* 2017;7:697-700; *Acta Obstet Gynecol Scand* 2014;93:1255-61). Disturbances of sleep and mood and decreased alertness are common in residents during night-float rotations, and one study concluded that physicians should be taught coping strategies for dealing with these effects (*Chronobiol Int* 2002;19:893-902). On the other hand, using a night float system to limit work hours has had a positive effect on patient outcomes and may improve work-life balance (*Ann Intern Med* 2007;147:97-103). No matter how night call programs are structured, even anticipating an overnight shift causes significant decreases in heart rate variability, which is a biomarker of physiological stress (*Anesth Analg* 2018;126:1013-8). Some institutions have made efforts to limit elective cases at night by expanding OR capabilities and building more ORs to shift this burden to daytime hours.

In situations when surgical procedures (including elective cases) must be done after hours, how should a night shift be structured? Many institutions simply ask (or require) that attending physicians work overnight, sometimes allowing them to start work in the late afternoon or early evening. Others schedule a dedicated group of physicians to work for several nights in a row, sometimes giving them the following week off. The effects of scheduling on human performance have been extensively studied in air traffic controllers, and it appears that the best option is to rotate shifts in a forward direction (i.e., day to evening to night) (*Ergonomics* 2007;36:59-64). Most studies recommend a shorter duration for night shifts, with a longer period for recovery after finishing a period of nights (*Int. J. Environ Res Public Health* 2022;19:4625; *Ann Intern Med* 2010;153:829-42). However, even working for several nights in a row, with ample sleep opportunities during the day, can impact the driving performance of anesthesia professionals. Ingesting a caffeinated beverage before driving in a high-fidelity simulator improved anesthesia residents' driving performance after a six-shift night float rotation (*Anesth Analg* 2020;130:66-75). Despite these issues, a dedicated team who works at night can be a viable solution. Creating a "nocturnalist" service from a pool of physicians who agreed to work primarily at night improved patient safety and increased resident satisfaction in the internal medicine service of a large community hospital (*Grad Med Educ* 2010;2:57-61).

The overriding concern is that we live in a culture in which physicians will do whatever is necessary when told that it is "for the patient," even if it involves sacrificing our own safety or health. In the moment, relinquishing sleep and personal time for an individual patient on a given day can save a life and may be the only ethical option. This forced altruism, however, is only necessary because of financially motivated staffing decisions that may have been made months or even years before. As a specialty, we need to work with our surgical colleagues, hospital administrators, and regulators to ensure that routinely scheduled complex cases do not start in the middle of the night. There will always be surgical emergencies, and procedures will often take longer than expected, but routine surgery should be scheduled during daytime hours, when the patient care team is well-rested and extra resources are available, if needed. We must also work to find a better balance between our duty to provide patient care while acknowledging our own physiological and psychological needs. Recognizing our limitations is the first step to incorporating changes that will ultimately improve the safety of both anesthesiologist and patient.

We need your help! The only thing in shorter supply than labetalol are reports to the AIRS database. Please consider submitting your near-misses, either confidentially or anonymously. Let's all learn from each other's experience. ■

Each month, the AQI-AIRS Steering Committee abstracts a patient history submitted to AIRS and authors a discussion of the safety and human factors challenges involved. Absence of commentary should not be construed as agreement with the clinical decisions described. Reader feedback can be sent to **airs@asahq.org**. Report incidents or download the AIRS mobile app at **www.aqiairs.org.**