Vigilance Research and Just Culture Principles

Challenges for a Connected Perioperative World

David L. Reich, M.D., Suzan Uysal, Ph.D.

THE publication by Jason M. Slagle *et al.*[1] in this issue of ANESTHESIOLOGY is a behavioral analysis of tasks and workload in an operating room (OR) environment at a single academic medical center. The scientific investigation continues the seminal investigations by the senior author, Matthew Weinger, which began at another institution. The "nature and incidence of potentially distracting non–patient care activities during anesthesia care" were observed and categorized during a data collection period (2007 to 2009) with ubiquitous OR computer workstations with internet access but that predated the era of smartphones. The authors found that self-initiated distractions were very common (54% of cases). These occurred mainly during maintenance of anesthesia, accounted for only 2% of case time, and were short in duration (median 2.3 s). Personal internet use was the most common distraction. A concerning finding was that 3.4% of cases where distractions were observed were temporally associated with nonroutine events, but the authors judged these not to be causal. The authors concluded that clinicians' judgment in managing distractions was not associated with an increased risk of adverse events. Similarly, another investigation reported that use of the OR computer workstation for purposes other than electronic anesthesia recordkeeping activities was not associated with hemodynamic aberrations.[2]

"...[do] non–patient care activities . . . help to maintain vigilance, despite the seeming contradiction[?]"

The debate among anesthesia practitioners as to the appropriateness of non–patient care-related activities in the OR during anesthesia care has a long history that originally focused on reading in the OR.[3,4] Hospital and anesthesia departmental policies often explicitly prohibit non–patient care-related reading or internet usage, yet these behaviors are very common in all medical specialties.

Perhaps the gold standard for categorizing medical professionals' electronic device behaviors during duty hours is the Just Culture movement, which is dedicated to reducing patient harm using a nonpunitive approach. Key Just Culture principles include classifying behaviors associated with errors into three categories (*i.e.*, "error," "at-risk," or "reckless") and modifying the organizational responses to reduce such behaviors. The non–patient care activities in the study by Slagle *et al.* would likely fall in the "at-risk" portion of that behavioral spectrum. A common nonclinical equivalent would be driving above the speed limit. The observation that nearly everyone violates speed limits does not change the at-risk or reckless nature of the activity.

The question that arises is how perioperative leadership should respond when harm occurs in the presence of electronic distractions. No matter how rare the adverse event (harming a pedestrian or harming a patient), how excusable are the behaviors that led to that event? In a Just Culture context, system changes (creating speed bumps in roads or banning cellphones from ORs) would act to reduce the at-risk or reckless behaviors instead of simply jailing the occasional unlucky driver or firing the occasional unlucky anesthesiologist.

If a person engages in at-risk behavior despite knowing the right thing to do (*e.g.*, nonprofessional texting or web browsing during anesthesia care), perioperative leadership must understand why people are engaging in this risky behavior. Leaders must determine the prevalence and causes of the behavior and what systems should be put in place that will encourage or force the correct behavior. The process changes should help anesthesia providers perceive the risks and chose correct behaviors. Last, the leadership should identify whether deviations from policy will be considered reckless and therefore punishable.

This is a nuanced issue, however. In the court of public opinion, having a physician not paying constant attention to his/her patient during anesthesia care seems clear cut. In the OR, however, physiologic monitors with audible alarms do not require constant visual attention, and the interactions that anesthesiologists have with other

Image: P. Topiwala, Brigham and Women's Hospital.

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Accepted for publication August 28, 2017. From the Department of Anesthesiology, Icahn School of Medicine at Mount Sinai, New York, New York.

 Anesthesiology 2018; 128:6-7

<zdoi;10.1097/ALN.0000000000001960>

individuals in the OR, computer workstations, and personal devices may serve an important purpose by maintaining a higher capacity for overall vigilance, essentially by avoiding boredom during low-activity phases of the anesthetic. In other words, is avoiding boredom important in maintaining vigilance?

Vigilance (also called "sustained attention") is the ability to maintain the focus of cognitive activity on a given stimulation source or task. Vigilance tasks are defined as long detection tasks of scarcely occurring signals. Tasks requiring sustained attention lead to a state of boredom and cognitive task performance decrements over time.[5–7] The vigilance decrement during tedious monitoring tasks is reflected in slower reaction times and an increase in error rates as an effect of time-on-task. The decrement appears after 20 to 30 min. This decrement has been ascribed to under-arousal caused by an insufficient workload or decreased attentional capacity, leading to the inability to sustain mental effort. The unanswered question from the work of Slagle *et al.* is whether non–patient care activities may help to maintain vigilance, despite the seeming contradiction.

This article has considerable potential for being misinterpreted, because non–patient care activities will be considered a dereliction of duty by some. It is clear that brief non–patient care activities are common during anesthesia care. There are no data, however, that indicate that anesthesiologists engage in these activities in ways that compromise patient care. In fact, brief distractions during monotonous portions of long cases may enhance vigilance, as has been shown in the cognitive psychology literature. Until there is evidence of harm, we should not automatically consider non–patient care activities to constitute inappropriate practice or assume that it falls into the Just Culture "risk" category.

Competing Interests

The authors are not supported by, nor maintain any financial interest in, any commercial activity that may be associated with the topic of this article.

Correspondence

Address correspondence to Dr. Reich: david.reich@mountsinai.org

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