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Having a nighttime critical care physician in the ICU doesn't improve patient outcomes, research finds

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With little evidence to guide them, many hospital intensive care units (ICUs) have been employing critical care physicians at night with the notion it would improve patients' outcomes. However, new results from a one-year randomized trial from researchers at Penn Medicine involving nearly 1,600 patients admitted to the Hospital of the University Pennsylvania (HUP) Medical ICU suggest otherwise: Having a nighttime intensivist had no clear benefit on length of stay or mortality for these patients, not even patients admitted at night or those with the most critical illnesses at the time of admission.

The research will be presented at the American Thoracic Society International Conference in Philadelphia May 20 by senior study author Scott D. Halpern, MD, PhD, assistant professor of Medicine, Epidemiology, and Medical Ethics and Health Policy, and published online the same day in the *New England Journal of Medicine*.

The findings raise a pertinent question in today's financially-conscious healthcare setting: Why invest financial resources to staff a nighttime intensivist if it's not improving patient outcomes?

"This is an important finding that affects a lot of stakeholders," said first author Meeta Prasad Kerlin, MD, MSCE, an assistant professor of Medicine in the division of Pulmonary, Allergy and Critical Care at the Perelman School of Medicine at the University of Pennsylvania.

"Staffing an intensivist at night is probably quite costly, because the total billing will likely be at a higher rate, which could trickle down to the insurance provider or patient. There's also the operating cost associated with staffing that impacts hospitals."

"Based on these results, if an academic hospital's primary goal is to improve patient outcomes, then I don't think having an attending physician physically there overnight in a medical ICU is necessary," she added. "In fairness, this study doesn't tell us what might happen with nighttime intensivists in ICUs that aren't like Penn's."

Today, one third of academic hospitals in the U.S. and three quarters in Europe staff a nighttime physician in the ICU, despite a lack of clear evidence demonstrating its effectiveness. Previous studies on the topic lacked experimental designs and produced mixed results.

The medical ICU at HUP is a closed system, also called "high-intensity," where patients are cared for by designated intensivists during the day, as opposed to "low-intensity" systems, where patients are not routinely cared for by intensivists during the day. A multicenter study published last year found that among ICUs with low-intensity daytime staffing, those employing nighttime intensivist staffing had lower-risk adjusted mortality compared to those without it. However, this larger multicenter study in NEJM, also presented at this year's conference by Dr. Kerlin, refutes this finding, demonstrating no clear benefit with nighttime intensivist staffing in any type of ICU.

For this trial, at Penn Medicine's 24-bed high-acuity medical ICU at HUP, researchers compared nighttime staffing (7 pm to 7 am) with in-hospital intensivists plus the usual complement of medical residents to residents alone (control). During the control periods at night, daytime intensivists were available by phone. The team randomly assigned one-week blocks and staff to the control or intervention nighttime staffing

model. They enrolled patients (1,598) admitted to the ICU during one year, from September 2011 to September 2012, and conducted in-hospital follow-up for an additional 90 days.

Nighttime intensivists, they found, had no effect on ICU length of stay, hospital length of stay, ICU or hospital mortality, ICU readmission among ICU survivors, or discharge to home. Surprisingly, patients admitted at night and those with the most severe illnesses at the time of admission also saw no benefit in outcomes.

"There's another way to look at these results," said Dr. Kerlin. "This tells me that residents and nurses are well qualified and completely competent to handle these patients. As long as nurses and residents have access to an on-call attending physician, then the patient will do as well as if the senior doctor was at their bedside."

Interestingly, the authors also found that residents believed nighttime intensivists improved their educational experience and provided desirable support for decision making. Given that, academic centers may wish to consider residents' perspectives in choosing to adopt or keep this model, the authors write.

However, because adoption of nighttime intensivist staffing by well-resourced hospitals may siphon intensivists away from less-resourced hospitals, the researchers call for further studies outside of academic medical centers.

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