

## Things We Do For No Reason™: Routine Overnight Vital Sign Checks

Nicola M Orlov, MD<sup>1,2</sup>, Vineet M Arora, MD, MAPP<sup>1,3\*</sup>

<sup>1</sup>Pritzker School of Medicine, University of Chicago, Chicago, Illinois; <sup>2</sup>Section of Pediatric Hospital Medicine, University of Chicago Medical Center, Chicago, Illinois; <sup>3</sup>Section of General Internal Medicine, University of Chicago Medical Center, Chicago, Illinois.

Inspired by the ABIM Foundation's Choosing Wisely® campaign, the "Things We Do for No Reason™" (TWDFNR) series reviews practices that have become common parts of hospital care but may provide little value to our patients. Practices reviewed in the TWDFNR series do not represent "black and white" conclusions or clinical practice standards but are meant as a starting place for research and active discussions among hospitalists and patients. We invite you to be part of that discussion.

### CLINICAL SCENARIO

The hospitalist admits a 73-year-old man with non-insulin dependent diabetes and essential hypertension to the general medicine ward for lower extremity cellulitis. The hospitalist uses standard admission orders, encourages him to elevate his leg above his heart, starts intravenous antibiotics, and monitors him throughout the day and night with regular vital signs. On his second day of admission, the patient's cellulitis clinically improves, and the team prepares for discharge. However, the nurse notes that the patient did not sleep well and has not slept since his 4 AM vitals were taken. Now a lethargic and confused patient, the team adds delirium to his problem list.

### WHY YOU MIGHT THINK Q4 VITAL SIGNS OVERNIGHT ARE HELPFUL

General medicine floors commonly default frequency for measuring vital signs to every 4 hours (Q4), a practice that dates back more than a century to the time of Florence Nightingale. This custom remains in place to ensure the ability to identify and intervene for those at risk for clinical deterioration and preventable death. Research supports the notion that frequent and consistent vital sign checks can minimize mortality and morbidity in the hospital. In fact, validated scoring systems incorporate vital signs with other clinical findings as a way of quickly identifying a patient with worsening clinical status.<sup>1</sup> Further, trends and trajectories in vital signs may enable us to identify those with impending decompensation.<sup>2</sup> A 2008 consensus statement made by experts in patient safety encouraged hospitals to use frequent vital sign monitoring of patients when available and affordable.<sup>3</sup> These interventions aim to help identify and treat patients with early clinical deterioration to prevent poor outcomes.

\*Corresponding Author: Vineet M Arora, MD, MAPP; Email: varora@medicine.bsd.uchicago.edu; Telephone: 773-702-8157; Twitter: @FutureDocs.

Published online first April 27, 2020.

Received: August 22, 2019; Revised: April 6, 2020; Accepted: April 7, 2020

© 2020 Society of Hospital Medicine DOI 10.12788/jhm.3442

### WHY Q4 VITAL SIGNS OVERNIGHT MIGHT NOT BE NECESSARY

The practice of checking vital signs every 4 hours throughout the night dates to long before the modern era of evidence-based medicine. Research thus far has not focused on the necessity of vital sign checks every 4 hours throughout the night, despite affecting almost every hospitalized patient. Further, patient acuity or need for monitoring does not drive the frequency of overnight vital signs; instead habit and defaults do. We often monitor patients at high risk for clinical deterioration just as frequently as patients at low risk.<sup>4</sup>

While evidence-based medicine influences much of clinical care, "real-world" needs encountered at the bedside often drive early adapters to innovate. Nurses, who spend the most time at the bedside and conduct the most regular patient assessments, have recognized that not all patients need vital signs checked every 4 hours throughout the night. In 2013, Hands et al conducted a chart review of hospital patterns and found that nurses obtained complete vital sign checks on patients less frequently throughout the night than during the day.<sup>5</sup> Their work further showed that nurses used their clinical judgment to make decisions about risk: Those patients deemed low risk by the nurses received fewer vital sign checks while the sicker patients received monitoring every 4 hours throughout the night.

Few researchers have quantitatively identified reasons why nurses may choose to not conduct frequent observations for some patients, beyond the providers' own experience and judgment. In one study, Hope et al conducted a qualitative analysis of nurses to better understand their reasoning behind who should and should not receive overnight monitoring.<sup>6</sup> The results of the analysis revealed that nurses recognize the importance of sleep in support of health and healing and use their clinical judgement when deciding which patients and conditions can forgo frequent observations.

Stiver et al conducted trailblazing work that examines the outcomes of decreasing overnight vital sign checks for low-risk hospitalized patients through a randomized pilot study.<sup>7</sup> In order to ensure patient safety, their group employed regular nurse observations throughout the night without waking the patient. Those patients assigned to less monitoring overnight reported a trend toward better sleep during hospitalization without the occurrence of any adverse events or escalation in care.

Most important, evidence indicates that sleep disruptions in the hospital worsen health and impede healing; further

supporting nurses' instincts and practices. Hospitalized adults without comorbidities who experience inadequate sleep during hospitalization have a higher perception of pain.<sup>8</sup> Similarly, research has associated hospital-induced sleep deprivation and a higher odds of elevated blood glucose in those without diabetes, or "hyperglycemia of hospitalization."<sup>9</sup> Furthermore, national organizations have recognized the importance of sleep. The American Academy of Nursing, as part of its Choosing Wisely™ campaign, states that, in the hospital, nurses should not disturb a patient's sleep "unless the patient's condition or care specifically requires it."<sup>10</sup>

Finally, in the era of COVID-19, any opportunity to support physical distancing and to limit face-to-face interaction could protect our patients and staff from acquiring SARS-CoV-2.

## WHAT WE SHOULD DO INSTEAD

While consistent vital sign checks allow for early identification of those trending toward clinical deterioration, risk stratification of ward patients can identify those who may benefit from overnight Q4 vital sign checks. While clinicians often use their judgment to identify a subset of low-risk patients for de-escalation of overnight care, artificial intelligence such as Modified Early Warning Score (MEWS) and Pediatric Early Warning Signs (PEWS) may have a role to play. These validated systems use physiologic symptoms that present prior to significant vital sign alterations to identify patients at risk for clinical deterioration.<sup>11</sup> As an example, one randomized, controlled trial used a risk stratification tool to eliminate overnight monitoring for low-risk patients. Patients slept more soundly and reported fewer noise disruptions and higher satisfaction with the nursing staff. No adverse events were reported for those who were electronically stratified as low risk.<sup>12</sup> Further, forcing clinicians to decide on the need for overnight vitals by removing the Q4 vital sign default in the electronic health records (EHR) may minimize overnight disruptions. The University of Chicago in Illinois has implemented "sleep-friendly" options for vital sign ordering in the EHR for both children and adults. Enhanced order sets force providers to consider whether patients qualify for fewer overnight interventions. This change, alongside staff education and empowerment, reduced interruptions overnight for both populations and improved patient experience.<sup>13</sup> This patient-centered practice mirrors a recent recommendation from the American Academy of Nursing to minimize sleep disruptions for hospitalized patients by letting low-risk patients sleep.<sup>10</sup>

## RECOMMENDATIONS

- Use clinical judgment or an existing risk stratification system, such as MEWS or PEWS, to identify patients who may benefit from more or less monitoring.
- Forgo overnight vital sign checks for low-risk patients.
- Check overnight vitals for low-risk patients at 10 PM and 6 AM.
- Use pulse oximetry or regular nurse checks as a balancing measure, especially in the pediatric population.

## CONCLUSION

Minimizing unnecessary sleep disruptors for hospitalized patients is essential for healing and health. The patient in the clinical scenario had iatrogenic comorbidities added during his hospitalization and an increase in length of stay that resulted from sleep-associated delirium. Hospitalists should take the lead in developing sleep protocols that can leverage current technology to "nudge" clinicians to improve patient sleep. We can modify the frequency of checking vital signs for low-acuity patients and alter environmental factors that may impair sleep, such as noise, light, and temperature, for high-risk patients who cannot forgo overnight vital sign checks. In addition to clinical judgment, artificial intelligence can enable hospitalists and nurses to determine which patients may benefit least from overnight vital sign checks. Finally, if we stop disrupting low-risk patients' sleep, we can better target resources to patients at high risk for clinical deterioration. Let's start improving inpatient sleep by eliminating the disruptive things we do for no reason.

*Do you think this is a low-value practice? Is this truly a "Thing We Do for No Reason™"? Share what you do in your practice and join in the conversation online by retweeting it on Twitter (#TWDFNR) and liking it on Facebook. We invite you to propose ideas for other "Things We Do for No Reason" topics by emailing TWDFNR@hospitalmedicine.org.*

Disclosures: The authors have no relevant conflicts of interest to report.

Funding: National Heart, Lung, and Blood Institute (NHLBI) grants 5R25HL116372 and 1K24HL136859

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