

## Where Is the Impact?

To the Editor:

As an advocate for patient safety and for the introduction of appropriate monitoring technology into perioperative practice, I read the recent article by Taenzer *et al.*<sup>1</sup> with anticipation. Unfortunately, the conclusions reached by the authors do not appear to be supported by the evidence provided in the article. Specifically, the authors conclude “our results demonstrate that continuous patient surveillance can improve outcomes in a postoperative orthopedic ward setting.” There was no meaningful difference in death, intensive care unit transfer, or hospital stay; the only reported difference was in the number of “rescue” events. The rescue events consisted of several levels of intervention ranging from conventional code blue teams to a bedside visit of an intensive care nurse and a respiratory care technician within 10 min of call. Surely, the “rescues” at the latter end of the range cannot be considered significant clinical or resource utilization outcomes as described within. Although the authors note that the types of rescues activated were collected, the actual distribution by type of event before and after surveillance was not provided in the article.

This article does break with tradition in a positive way in that it studies the impact of SpO<sub>2</sub> surveillance in a clinical area where, by routine practice, patients are only assessed intermittently and where hypoxic events are not rare. In the past, the value of pulse oximetry was assessed in areas where intensive monitoring was already the rule.<sup>2</sup>

One cannot help but be a bit confounded by the results of this study because important data are absent. At its heart, the authors claim that surveillance reduces interventions, but how is this possible? *A priori*, more monitoring should detect more true hypoxia, which in turn should lead to more interventions (at an earlier stage, perhaps), not fewer, in order to improve true clinical outcomes. Are there important patient care interventions that are excluded from reporting in this article, such as direct nursing care and calls to and action by responsible physicians, among others? No mention is made of what process a floor nurse was to follow, protocol-driven or *ad hoc*, once notified by the central paging system. Did the frequency of nurse intervention in adjusting a patient's posture or supplemental oxygen delivery, among other actions, change with surveillance?

Finally, one is left curious about the impact of more intense respiratory monitoring on postoperative management and patient satisfaction because these are not addressed in the article. We look forward to further research using this model once adequately powered to discern clinically relevant outcomes.

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## References

1. Taenzer AH, Pyke JB, McGrath SP, Blike GT: Impact of pulse oximetry surveillance on rescue events and intensive care unit transfers: A before-and-after concurrence study. *ANESTHESIOLOGY* 2010; 112:282-7
2. Pedersen T, Hovhannisyan K, Møller AM: Pulse oximetry for perioperative monitoring. *Cochrane Database of Systematic Reviews* 2009, Issue 4. Art. No.: CD002013

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## In Reply:

We appreciate the interest Dr. and Mrs. Rampil have taken in our recent article in *ANESTHESIOLOGY*.<sup>1</sup> As highlighted in their letter, the introduction of surveillance monitoring, as commonly used in the intensive care unit or the operating room, into the general-care setting (a traditionally unmonitored environment) does break new ground. It provides tremendous opportunities for research, education, and improvement in patient safety.

In our article, we demonstrated a reduction in intensive care unit transfers by almost 50% and a decrease in rescue events by 65%; in our view, these are meaningful changes. Although we did see a statistically significant reduction in mortality, we deemphasized that change because of a possible small number effect. Even though Dr. and Mrs. Rampil are concerned about adequate power, the study's sample size with 19,070 patient days analyzed was clearly sufficient; indeed, as stated above, we chose to not emphasize some changes (such as mortality), even though they were statistically significant.

We do agree that a reduction in intensive care unit transfers and rescue events are proxy outcomes as a measure of escalation in care and that better surveillance prompts earlier intervention, which leads to a reduction in escalation in care. Our interpretation is indeed, as hypothesized by the Rampils, that improved monitoring leads to an increase in early interventions and thus prevents adverse events and an escalation in care. Nursing interventions, such as those triggered by the monitoring system, were by protocol. A measure of these early interventions may be desirable, but we had decided that if a clear link could be established between the introduction of the system and a decrease in escalation of care, we may conclude that it is due to earlier interventions without measuring them directly.

We are continuously monitoring overall patient satisfaction, as well as nurse satisfaction, with Patient Surveillance. Patient satisfaction has not changed with the introduction of Patient Surveillance on the unit we reported on, nor on two

more surgical units that the system has been introduced to since, while nurse satisfaction has increased.

Abenstein and Narr<sup>2</sup> stated in an accompanying editorial to our article, "Early intervention guided by this system reduced the need for patient rescue interventions, including Intensive Care Unit transfers. These results could have important implications for hospital wards throughout the country." We entirely agree and would like to point out that much work remains to be done in the area of Patient Surveillance. Our publication was a first step in that direction. We hope that anesthesiologists, given their expertise in patient safety and monitoring, will be at the forefront of these exciting developments.

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## References

1. Taenzer AH, Pyke JB, McGrath SP, Blike GT: Impact of pulse oximetry surveillance on rescue events and intensive care unit transfers: A before-and-after concurrence study. *ANESTHESIOLOGY* 2010; 112:282-7
2. Abenstein JP, Narr BJ: An ounce of prevention may equate to a pound of cure: Can early detection and intervention prevent adverse events? *ANESTHESIOLOGY*. 2010; 112:272-3

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