Navigating Discharges from Intensive Care Unit to Ward

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Digital smartphone maps have transformed personal travel. Trips that previously required atlases, written instructions, or memorized directions now occur effortlessly. At the same time, the way that we interact with the world has been fundamentally altered by the rise of global positioning systems. More often than not, our increasing dependence on technology has made driving safer and more convenient, though notable exceptions exist (1).

Unlike most of our daily commutes, patients discharged from the intensive care unit (ICU) to the general medical ward face a perilous journey. Patients leave the relative "safety" of the ICU and must traverse dangerous obstacles, such as the lack of standardized ICU discharge criteria, the transition to lower-resourced settings, and multiple care handoffs with the potential for communication failures. Each step can result in patient harm (2). It is no surprise, then, that readmissions to the ICU occur, with rates in the literature generally ranging between 4% and 14% (3, 4). Readmissions are important because they have been associated with mortality and increased hospital length of stay (5).

Sometimes, ICU readmissions could have been preventable. For example, diagnostic or management errors are unfortunately common and may have been avoided. On the other hand, older age, higher sequential organ failure assessment (SOFA) score, presence of infection, severe disease, immunodeficiency, and vasopressor use are widely considered predictors of ICU readmission (6). These largely nonmodifiable patient factors call into question whether ICU readmissions are a meaningful indicator of quality of care (6).

Similar to conventional wisdom for endotracheal reintubations, a certain proportion of ICU readmissions must be tolerated (7). An ICU readmission rate of 0% suggests that patients are being sheltered in the ICU for an unnecessarily long period of time, inflating ICU census, workload, and hampering healthcare efficiency. On the other hand, when ICU readmissions are excessive, patients are being transferred out of the ICU too early (i.e., when they could still benefit from ICU-level care).

Despite this complexity, no widely accepted criteria for ICU discharge exists, and ICU discharge decisions are left to clinician discretion. Although literature exists regarding clinicians' ability to predict mortality, clinicians' accuracy for predicting ICU readmissions has not been previously studied (4, 8, 9).

In this issue of *AnnalsATS*, Rojas and colleagues (pp. 847–853) conducted a prospective study to examine how well clinicians can predict ICU readmission (10). ICU nurses, residents, fellows, and attendings were surveyed to assess three outcomes: readmission within 48 hours of ICU discharge, readmission at any time, and in-hospital mortality. The authors hypothesized that, on average, clinicians would have poor accuracy in predicting early ICU readmission but that clinicians with more experience would be more accurate than those with less experience. The authors surveyed 2,833 clinicians for 938 ICU transfers, and 4% of patients experienced a readmission to the ICU with a median time to readmission of 82 hours. They found that clinicians, regardless of experience, had only fair accuracy for predicting ICU readmission within 48 hours. Nurses were narrowly the most accurate, followed by residents, attendings, fellows, and interns. Overall, clinicians were felt to have limited ability to predict which patients would be readmitted to the ICU.

Interestingly, clinicians in this study were better at predicting mortality than readmissions. This seems problematic because previous studies have shown that clinicians are not very good at predicting mortality (8). In one study, about half of ICU patients survived the hospitalization despite predictions that they would die (9).

We believe it is not particularly surprising that clinicians are better at predicting mortality than readmissions. First, most clinical training is intensely focused on identifying patients at high risk of death, rather than patients at high risk of

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readmission. Second, the reasons behind ICU readmissions can be complex, as patient-, provider-, and system-level factors can all contribute to various degrees. Certainly, sicker patients are likely to be readmitted. However, we might also consider situations in which heightened ICU demand forces a patient to the general ward faster than if circumstances had not required it. Capacity strain, both on the ICU and on the ward, may be independently associated with mortality and affects both decisions to discharge patients from the ICU and to readmit them to the ICU (11, 12). Importantly, the underlying reason behind each readmission was not collected in this study, preventing an assessment of whether clinicians are better at predicting patient-related versus system-related readmissions.

Perhaps, the most important consideration of this study is whether we should reconsider the way we decide to discharge patients from ICU care. In our current practice, a clinician (perhaps a physician or nurse) vocalizes that they believe the patient is ready to leave the ICU. Sometimes, this may be followed by a discussion about whether or not the patient is "ready" to go to the ward. Might alternative strategies improve or, at least, standardize this process?

Here, we face an increasingly common problem in medicine. Are there opportunities to improve the way we, as humans, practice medicine, or should we focus on computerized strategies to assist or replace decision-making? On one hand, there is clear evidence that algorithmic decision-making is less prone to the biases commonly encountered by human decision-making (13, 14). Perhaps, the development of computerized decision support tools could identify patients at highest risk of ICU readmission to further enhance care. On the other hand, decision support tools may be limited if the majority of readmissions are due to systems failures. Thus, it may also be prudent to develop clinician-facing interventions to prevent ICU readmissions, such as efforts to reduce diagnostic or therapeutic errors, improve care handoffs, and train clinicians to better identify patients at risk for readmission.

Ultimately, our resources in the ICU have limitations, and we must consider how best to establish important goals and achieve them. Is an ICU readmission rate of 4% acceptable? Possibly so, and we must consider how much lower we can reasonably reduce readmissions without suffering from unintended consequences. At the same time, we constantly strive in medicine to provide the best possible care for each of our patients. When a patient is readmitted to the ICU, we, as clinicians, often experience an inherent feeling of failure.

As intensivists, we must consider whether we can develop better guides for clinicians discharging patients from the ICU. Can our traditional maps and heuristics be improved on, or should we focus on the development of dynamic, decision support tools mimicking real-time global positioning systems? Ultimately, it may come down to whether we believe the ICU discharge process is lost and our willingness to ask for directions. ■

Author disclosures are available with the text of this article at www.atsjournals.org.

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