institutions and by examining more closely the temporal evolution of EEG characteristics in order to further improve prognostic accuracy. This accumulating evidence will further strengthen the case that EEG monitoring for prognostication following pediatric cardiac arrest is indeed "ready for prime time."

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PICU Readmissions: Not Just Output but Patient Throughput*

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Prognostication has traditionally been identified as one of the chief skills of the intensivist. One very important aspect of prognostication is the ability to safely predict which patients are ready for to discharge, whether to a lower level of care or to home. As demand for limited intensive care resources grows, discharge decision making is often influenced by external nonclinical factors, sometimes resulting in unintended risks for the patient and the healthcare system. Among both adult and pediatric patients, a predominant risk of discharge is unplanned readmission—a factor known to be associated with adverse patient outcomes, a measure of potentially preventable utilization, and a frequently referenced indicator of quality (1–7). In this issue of *Pediatric Critical Care Medicine*, Kotsakis et al (8) contribute to the growing literature specifically focused on discharge and unplanned readmission from the perspective of the pediatric intensivist. Their finding that 2.5% of patients discharged from their pediatric cardiac and medical/surgical ICUs are readmitted within 48 hours and that such patients are at increased risk for mortality is generally consistent with previous reports analyzing large groups of patients (3, 4, 6). They also identify several clinical factors, including potentially modifiable ones, which are associated with an increased risk of readmission to the PICU. In so doing, they successfully responded to a 2013 editorial calling for data describing patient physiologic status and clinical interventions immediately before discharge and applying a standard 48-hour follow-up period for readmission (9).

In considering how to apply these findings to make discharge decisions safer, a pediatric intensivist could ask how successful available patient-level information is in predicting readmission. Such a question is traditionally assessed by considering an algorithm's sensitivity, specificity, discrimination, and positive and negative predictive values. The epidemiologic understanding of tradeoffs between sensitivity and sensitivity acknowledges that the goal of zero readmissions may not be either possible or desirable as it would have the effect of increasing length of stay and decreasing the availability of PICU resources. Put succinctly, the ability to prognosticate for individual patients confronts the inevitable challenge of whether to prefer false positives (patients discharged from the PICU with a high risk of unplanned readmission) or false negatives (patients retained in the PICU when PICU resources are not needed).

Although the impressive analyses of Kotsakis et al (8) improve our understanding of factors associated with PICU

*See also p. 558.

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readmission and identifies specific factors associated with an increased likelihood of unplanned readmission, as intensivists, we are left wondering how to incorporate these findings into our discharge clinical decision making. Others have tried to create decision tools, including Mandell et al (10), by applying the epidemiologic approaches in case-control analyses of unplanned readmissions within 48 hours of discharge. Unfortunately, previous attempts to consider a variety of clinical factors, including the Pediatric Early Warning Score, have resulted in very simple prediction models and algorithms with limited discrimination and clinical utility. Based on these pediatric-specific reports, it seems that the clinical factors identified as predictive of unplanned readmission (generally those patients with more complex medical conditions and those who are discharged less clinically stable) are insufficient to predict either the need for ongoing intensive care or the readiness for discharge.

The incomplete utility of clinical and pathophysiologic data to identify those patients at high risk of unplanned readmission raises a second question: whether analyses of PICU discharge and readmission data incorporate all of the relevant types of information. Perhaps by broadening the information we consider, improved discharge decision making may be possible and painful tradeoffs may be avoided. For example, external and contextual institutional factors have also been shown to influence both PICU discharge decisions and measures of patient safety. There is evidence from published studies in critically ill adults that such institutional factors, specifically the demand for ICU beds, increase the likelihood of unplanned readmission and potentially increase mortality (11–13). Furthermore, specific interventions to support patients in the critical time period after discharge from the PICU to the floor have been shown to successfully reduce unplanned PICU readmissions (14).

There is, then, evidence suggesting that analyses of PICU discharge and unplanned readmissions could be thoughtfully broadened by including broader types of data, such as staffing and other resources, demand for hospital and intensive care beds, overall unit acuity, and throughput. Ideally, such research and quality improvement efforts would require the inclusion of additional content in pediatric datasets, including unit specific, hospital specific, and multi-institutional specific data using standard definitions and validated information sources.

In conclusion, to both understand and improve PICU discharge decision making, we propose considering more comprehensive data that include nonclinical factors. Patient outcomes are, after all, determined not only by the intensivist but also by the entire intensive care team and not just by patient clinical or physiologic status but also by the efficiency and effectiveness of the entire clinical enterprise. By considering these factors, we may not only be able to better prognosticate the results of PICU discharge but also reduce the hazards of such transitions in care.

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