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The author replies

Murray M. Pollack, MD

Department of Child Health, University of Arizona College of Medicine Phoenix, Phoenix, AZ, and
Critical Care Medicine, Phoenix Children's Hospital, Phoenix, AZ

The letter by Spentzas (1) presents several interesting issues regarding severity of illness scores and their uses. Spentzas (1) comments that Pediatric Risk of Mortality (PRISM) “carries issues from the past structure of the PICU.” Actually, the current series of investigations are designed to not only meet the evolutionary changes of the PICU but also stimulate future PICU assessments to keep up with the new focus of pediatric critical care and the prevention of morbidity and mortality. First, the National Institute of Child Health and Human Development Collaborative Pediatric Critical Care Research Network (CPCCRN) developed a measure of morbidity, the Functional Status Score, that is suitable for use in large-scale pediatric such as those required for quality studies (2). Second, the CPCCRN revised the time period for collecting the PRISM score to better separate the assessment of severity of illness (physiological instability) from the outcome (3). Third, the CPCCRN will construct predictors of both morbidity and mortality. This prospective dataset of over 10,000 patients is nearing completion.

Our ability to pursue the prediction of morbidity and mortality is made possible by the strong conceptual foundation of PRISM—patients with unstable physiological status are more likely to die, and this risk is related to the extent of their physiological instability (4). Soon we will test the hypothesis that physiological instability is also a predictor of new morbidity. Mortality and morbidity prediction algorithms are developed by adding other information that is not well represented by physiological status (age, certain diagnosis, etc) (4). Other pediatric scores, such as the Pediatric Index of Mortality (PIM), do not have as firm a conceptual underpinning as PRISM. PIM in particular is based on a variety of diagnoses and only a few physiological variables (5). Although such scores may or may not be good at predicting mortality risk, they do not have a clear concept of severity of illness and that may limit their utility (6, 7). Spentzas (1) mentions the Injury Severity Score and notes some hypothesized advantages of this and other diagnostic-based systems. Although diagnostic-based systems are widely used (often because the information is in the medical records and “free”) and are often useful, they suffer from significant issues; either they are determined from discharge data (and thus subject to gaming and quality of care issues) or they are limited to select groups (i.e., trauma patients) (8).

We also believe that quantification of physiological status is, by itself, a valuable tool as evidenced by the thousands of Copyright © 2013 by the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies DOI: 10.1097/PCC.0b013e3182a54dab Letters to the Editor Pediatric Critical Care Medicine www.pccmjournal.org 913 studies using severity of illness scores that quantify

physiological status to control for severity of illness or better describe the patient population of interest.

It is always important to consider the most important intended use of the score. Although Spentzas (1) implies such scores should be useful for individuals, I have vigorously resisted this use until further research is done; we do not sufficiently understand issues of accuracy and prognostic “certainty” to use prognostication scores for individual decision making (9, 10). The two most important intended uses of PRISM are quality of care studies (internal and external benchmarking) and as a control for severity of illness in descriptive or interventional studies. For both of these uses, separating severity assessment from therapy is one important consideration. That was the central focus of the recent study in which we determined that the best time period for collection of laboratory data was the 2 hours prior to PICU admission to 4 hours after PICU admission (3).

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References

1. Spentzas T. Pediatric Risk of Mortality: Is It the Time of Admission or the Disease? *Pediatr Crit Care Med*. 2013; 14:912. [PubMed: 24226564]
2. Pollack MM, Holubkov R, Glass P, et al. Eunice Kennedy Shriver National Institute of Child Health and Human Development Collaborative Pediatric Critical Care Research Network: Functional Status Scale: New pediatric outcome measure. *Pediatrics*. 2009; 124:e18–e28. [PubMed: 19564265]
3. Pollack MM, Dean JM, Butler J, et al. The ideal time interval for critical care severity-of-illness assessment. *Pediatr Crit Care Med*. 2013; 14:448–453. [PubMed: 23628831]
4. Pollack MM, Patel KM, Ruttimann UE. PRISM III: An updated Pediatric Risk of Mortality score. *Crit Care Med*. 1996; 24:743–752. [PubMed: 8706448]
5. Slater A, Shann F, Pearson G. Paediatric Index of Mortality (PIM) Study Group: PIM2: A revised version of the Paediatric Index of Mortality. *Intensive Care Med*. 2003; 29:278–285. [PubMed: 12541154]
6. Czaja AS, Scanlon MC, Kuhn EM, et al. Performance of the Pediatric Index of Mortality 2 for pediatric cardiac surgery patients. *Pediatr Crit Care Med*. 2011; 12:184–189. [PubMed: 20581732]
7. Pollack MM. It is what it was. *Pediatr Crit Care Med*. 2011; 12:228–229. [PubMed: 21646950]
8. Pollack, MM. Severity-of-illness scoring systems. In: Nichols, DG., editor. *Rogers' Textbook of Pediatric Intensive Care*. 4. Philadelphia, PA: Wolters Kluwer; 2008. p. 106–113.
9. Pollack, MM. Prognostication scores. In: Field, MJBR., editor. *When Children Die: Improving Palliative and End-of-Life Care for Children and Their Families*. Washington, DC: The National Academies Press; 2003. p. 449–475.
10. Marcin JP, Pretzlaff RK, Pollack MM, et al. Certainty and mortality prediction in critically ill children. *J Med Ethics*. 2004; 30:304–307.10.1097/PCC.0b013e3182a54de7 [PubMed: 15173368]