HHS Public Access

Author manuscript

Crit Care Med. Author manuscript; available in PMC 2018 March 01.

Published in final edited form as:

Crit Care Med. 2017 March ; 45(3): e333–e334. doi:10.1097/CCM.0000000000002224.

The authors reply

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Keywords

Critical care; endotracheal extubation; predictive value of tests

We appreciate the interest of Luglio and colleagues (1) on our recently published paper, in particular, and in extubation readiness testing (ERT) in critically ill children, in general (2). Luglio and colleagues brought up a number of important points that we initially addressed in our original publication.

The association between Pediatric Risk of Mortality (PRISM) III-12 score and extubation success is unclear. This association is confounded by cognitive impairment but likely not the etiology of the respiratory failure. In our multivariable analysis, baseline Pediatric Cognitive Performance Category score >1 was associated with extubation success for the primary (odds ratio: 3.70; 95% confidence interval: 1.07–12.75) and secondary cohorts (odds ratio: 2.68; 95% confidence interval: 1.50–4.77) (3)(Supplemental Table 8). Risk of mortality scores, such as PRISM III-12, are validated to predict mortality in a population, and not at the individual level. PRISM III-12 was not designed to evaluate severity of illness in an individual patient and as was noted in our publication, the analysis gave a statistical result that may not be clinically relevant (4).

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Dr. Gedeit disclosed that he does not have any potential conflicts of interest.

Non-invasive ventilation (NIV) is commonly used after extubation, sometimes routinely regardless of the perceived need for respiratory support. While we agree with Luglio and colleagues that some children may need NIV (biphasic positive airway pressure or high-flow nasal cannula) to prevent re-intubation, we were uncertain on the intent for the use of NIV in our study subjects. To address this uncertainty, we analyzed our data with and without the use of NIV to define extubation failure. With both definitions, our results were consistent with positive predictive value of our ERT for a successful extubation of at least 80%.

We acknowledged in our publication the limitation of the use of pressure support during ERT. As Luglio and colleagues noted, Khemani et al demonstrated that the use of pressure support under-estimated the work of breathing post-extubation (5). While this is important information to be aware of, further studies are needed to determine whether the discrepancy in the work of breathing with the use of positive pressure translates to differences in the accuracy of ERT protocols that do not use positive pressure.

In conclusion, we agree with most of the points raised by Luglio and colleagues. Other issues, such as timing of extubation and clinical significance of secretions, require prospective testing to improve our ability to predict when a child who is invasively ventilated for lower respiratory tract disease is able to successfully tolerate extubation.

Acknowledgments

Copyright form disclosure: Dr. Faustino received support for article research from the National Insitutes of Health (NIH). Dr. Schwarz received support for article research from the NIH. Dr. Asaro received support for article research from the NIH. Her institution received funding from NIH/National Heart, Lung, and Blood Institute (NHLBI). Dr. Wypij received support for article research from the NIH. His institution received funding from NIH/NHLBI. Dr. Curley received support for article research from the NIH. Her institution received funding from NHLBI: HL086622.

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