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Distinguishing the Effects of iNO and Lung Recruitment in PARDS: The Authors Reply

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To the editor

We appreciate the interest by Dr. Miyoshi and colleagues (1) in our manuscript detailing the association between a positive oxygenation response to inhaled nitric oxide (iNO) and greater probability of successful extubation in pediatric acute respiratory distress syndrome (PARDS) (2). They suggest that a positive response defined as a 20% improvement in oxygenation 6 hours after iNO initiation is imprecise, since multiple patient and ventilatory parameters can change in that timeframe. Specifically, they suggest that lung recruitment over the 6 hours after iNO exposure could account for the apparent response to iNO.

The timeframe for 6 hours was chosen *a priori*, and was based upon prior literature testing response to iNO in pediatrics, in which improved oxygenation was reported between 4 and 12 hours after starting iNO (3, 4). Additionally, we recorded mean airway pressure (mPaw) over the first 6 hours after iNO initiation, and we did not see an increase in mPaw in responders, whereas we did with non-responders (Figure 1 in our manuscript), suggesting that providers were not attempting additional recruitment in the responder group. Regarding their suggestion that we use a shorter timeframe to assess iNO responsiveness, we agree, and are currently attempting to define this timepoint using prospective data collection, thereby overcoming some of the limitations inherent to our retrospective observational study.

We thank Dr. Miyoshi and colleagues for their kind words regarding our manuscript. We agree that this is not the final word on this subject, and we agree that 6 hours may not be the timeframe in which to definitively assign iNO responsiveness. We limited the conclusions of our manuscript to three essential points: 1) a subgroup of children with PARDS that benefits from iNO may exist, 2) response to iNO at 6 hours is associated with improved outcomes,

and thus iNO responsivity should be assessed in future trials; and 2) lack of iNO response should prompt practitioners to discontinue this expensive, and in those cases ineffective, treatment.

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References

1. Miyoshi H, Inata Y, Takeuchi M. Distinguishing the effects of iNOS and lung recruitment in PARDS: Scope for further improvement. *Pediatr Crit Care Med*. 2018 IN PRESS.
2. Dowell JC, Thomas NJ, Yehya N. Association of Response to Inhaled Nitric Oxide and Duration of Mechanical Ventilation in Pediatric Acute Respiratory Distress Syndrome. *Pediatr Crit Care Med*. 2017; 18(11):1019–1026. [PubMed: 29099443]
3. Dobyns EL, Anas NG, Fortenberry JD, et al. Interactive effects of high-frequency oscillatory ventilation and inhaled nitric oxide in acute hypoxemic respiratory failure in pediatrics. *Crit Care Med*. 2002; 30(11):2425–2429. [PubMed: 12441749]
4. Bronicki RA, Fortenberry J, Schreiber M, et al. Multicenter randomized controlled trial of inhaled nitric oxide for pediatric acute respiratory distress syndrome. *The Journal of pediatrics*. 2015; 166(2):365–369. e361. [PubMed: 25454942]