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Comment on the article “Physiological effects and safety of bed verticalization in patients with acute respiratory distress syndrome”, from Bouchant et al.

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To the Editor,

First, we would like to express our appreciation for the recent study titled “Physiological effects and safety of bed verticalization in patients with acute respiratory distress syndrome,” authored by Bouchant et al. and recently published in *Critical Care* [1]. This innovative exploration of bed verticalization in patients with acute respiratory distress syndrome (ARDS) offers valuable insights into potential improvements in respiratory mechanics and oxygenation.

However, after a thorough review of this article, several important concerns have arisen that warrant further discussion and clarification.

Fluid responsiveness and other hemodynamic data. While the study mentioned the use of fluid optimization based on preload dependency data, it did not provide details regarding the patients’ fluid responsiveness status. Knowing whether patients were fluid-responsive

or unresponsive at various stages of the verticalization process is crucial for interpreting the hemodynamic consequences of the experiment. Extreme fluid responsiveness can put patients at risk of hemodynamic instability, hypoperfusion, hyperadrenergic compensation, and limited reserve for oxygen demand. This is precisely what we believe occurred in some patients, as reported by the authors.

As shown in Table 2, patients were managed with a positive end-expiratory pressure (PEEP) of 12 cmH₂O at all times. This is an important contributing factor to hemodynamic instability, as a PEEP above 10 cmH₂O can significantly reduce cardiac output in the supine position [2, 3], let alone in a vertical position. Thus, more detailed reporting of fluid responsiveness status or surrogates, such as stroke volume variation or pulse pressure variation, would better inform cardiopulmonary interactions in these patients and improve the clarity and applicability of the findings. Was the overall increase in heart rate throughout the experiment even greater in patients who decompensated? What was the trajectory of systolic arterial pressure?

Guideline Applicability. The authors referenced the Guidelines for Perioperative Hemodynamic Optimization from the Société Française d’Anesthésie et de Réanimation [4] to manage fluid optimization in ARDS patients. However, it is important to consider the appropriateness and applicability of these perioperative guidelines in the context of ARDS management. Patients with ARDS face unique physiological challenges, including

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altered lung mechanics and gas exchange, along with secondary cardiovascular derangement, which may not be fully addressed by perioperative optimization strategies designed for surgical patients.

Addressing these concerns could significantly enhance the clarity and applicability of the study findings and contribute to better recommendations for improving the outcomes of patients with ARDS. We look forward to the authors' response and the possibility of further discussion of these critical aspects of this important study.

Best regards,
Ricardo Castro.
Eduardo Kattan.
Glenn Hernández.

Abbreviations

ARDS Acute respiratory distress syndrome
PEEP Positive end-expiratory pressure

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Author contributions

R.C. wrote the first draft of the manuscript. E.K. and G.H. commented on previous versions. All authors read and approved the final manuscript.

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