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## In Patients with ARDS, Optimal PEEP Should Not Be Determined Using the Intersection of Relative Collapse and Relative Overdistention

To the Editor:

With great interest, we read the article by van der Zee and colleagues suggesting an individualized approach for setting the correct amount of positive end-expiratory pressure (PEEP) in ventilated patients with coronavirus disease (COVID-19) (1). In their cohort of 15 mechanically ventilated patients with COVID-19, they used electrical impedance tomography to study the relative overdistention and relative collapse curves. The authors state that optimal PEEP for these patients is at the intersection of these curves and close to the values suggested in the high PEEP/ $FiO_2$  table. This intersection has indeed been used to set optimal PEEP but only for mechanical ventilation during surgery (2).

Using the intersection of relative collapse and relative overdistention suggests that both phenomena are equally harmful for patients with acute respiratory distress syndrome. Unfortunately, there is no evidence in the literature that supports this assumption. In fact, several studies and reviews suggest the opposite: overdistention may be more harmful (3–5).

We fully agree with the authors that an individualized approach for mechanical ventilation for patients with COVID-19 (or any form of acute respiratory distress syndrome for that matter) is very important. But instead of recruitment of the lung with high PEEP, prone positioning with lower PEEP levels could be considered to improve oxygenation and to recruit parts of the lung. In 14 patients admitted to our ICU, we have shown that using more PEEP often leads to reduction in lung compliance and increase in dead space ventilation, which suggests overdistention of alveoli (6).

In conclusion, although atelectrauma decreases with higher levels of PEEP, hyperinflation increases, which is potentially even more harmful. Therefore, using the intersection of the relative overdistention and relative collapse with electrical impedance tomography in patients with COVID-19 is not the technique to determine optimal PEEP for the individual patient. What van der Zee and colleagues do very elegantly show us with their research, however, is that there is always a tradeoff with higher levels of PEEP. ■

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## Reply to van den Berg and van der Hoeven

From the Authors:

We thank van den Berg and van der Hoeven for the opportunity to further discuss our research letter in which positive end-expiratory pressure (PEEP) was titrated at the level of lowest relative alveolar overdistention and collapse based on electrical impedance tomography (EIT) (1). In their comment, the authors argue that PEEP should not be set at the minimum level of both alveolar overdistention and collapse, as alveolar overdistention is potentially more harmful.

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