

ize the spirometric criteria of airway reversibility in COPD.

Helmi Ben Saad MD PhD
Laboratory of Physiology
Faculty of Medicine of Sousse
University of Sousse
Sousse, Tunisia

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Promoting the Inclusion of Lung Volumes in the Reversibility Evaluation—Reply

In reply:

We greatly appreciate the thoughts Dr Ben Saad has shared with us about hyperinflation and our research. We think his research on lung volume reversibility¹ complements ours.² The question of whether residual volume change was more sensitive than FEV₁ or FVC change is a problematic one because all thresholds for responsiveness are arbitrary and can be manipulated by setting them higher or lower. What we found was that residual volume change correlated poorly with FEV₁ and FVC, which led us to conclude that we were describing a novel group of responders.

The research of Dr Ben Saad¹ shows that there were more residual volume responders in the hyperinflated group but not the control, which suggests that there are probably differences between hyperinflated people and those that are not hyperinflated. This makes us wonder whether we should use obstructed patients to help guide us to what expected change is and not use healthy subjects.³

Ultimately, we think the more we expand our knowledge about lung volumes the better off we will be understanding obstructive lung diseases. We think residual volume changes add important information about obstructive lung diseases.

Conor T McCartney MD

Department of Internal Medicine
St. Louis University
St. Louis, Missouri

Gregg L Ruppel MEd RRT RPFT FAARC

Ravi P Nayak MD
Department of Internal Medicine
Division of Pulmonary, Critical Care, and
Sleep Medicine
St. Louis University
St. Louis, Missouri

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A Shout Instead of a Whisper: Let's Get the Graphics Right

To the Editor:

In July of 2013, Mark Siobal and colleagues wrote a paper on volumetric capnography in *RESPIRATORY CARE*.¹ In a subsequent letter to the Editor,² I pointed out an error in their Figure 8. In that figure, the quantity V_{Dalv} is represented as the shaded areas between the volume curve and the CO₂ axis. Although the vertical axis is labeled simply CO₂, there are horizontal lines labeled P_{aCO_2} , P_{ACO_2} , etc, implying that the vertical axis represents pressure. The problem is that if the vertical axis is pressure, then the areas on the graph have the wrong dimensions; they are not volumes. Unfortunately, Mr Siobal failed to heed my advice and, in his most recent paper on the same subject,³ has made the same error 7 more times (Figs. 4, 5, 6, 14, 15, 18, and 19; most of which explicitly label the vertical axis as P_{CO_2} in mm Hg). Figure 6 is particularly egregious because its legend says "From reference 106, with permission." Checking that reference,⁴ we see it repeatedly shows the vertical axis labeled as *Exhaled FCO₂* (carbon dioxide fraction), not P_{CO_2} , for volumetric CO₂ curves.

Here is the significance of the error. The dimensions of any area on an x-y plot are the dimensions of the vertical axis times the dimensions of the horizontal axis. For example, if the y axis has the dimension of length (L) and the x axis also has the dimension of length, then any area on the graph has the dimensions