



Differences in ventilatory muscle recruitment and work of breathing in COPD and interstitial lung disease

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To the Editor:

A recent article by FERREIRA *et al.* [1] entitled “Differences of ventilatory muscle recruitment and work of breathing in COPD and interstitial lung disease during exercise: a comprehensive evaluation” presents data that require clarification to ensure the accuracy of the study’s conclusions. In this study, the work of breathing is calculated from flow, volume and oesophageal pressure measurements, assuming constant lung and chest wall compliance. The calculations involve integration of pressure differences with respect to volume. The physical principles behind these calculations can be intuitively depicted by pressure–volume loops in a Campbell diagram as seen in figure 6 of the publication [1].

Specifically, the resistive work of breathing (WOB) corresponds to the area enclosed by the oesophageal pressure trace and the transpulmonary pressure line, on the left during inspiration (shown in dark turquoise), and on the right during expiration. The expiratory resistive work can be further partitioned into its two sources, one being the elastically stored energy from the previous inspiratory effort (shown in light turquoise), and the other being an active expiratory muscle activity (shown in white). Somewhat confusing is the labelling of the elastic recoil component of the expiratory resistive work as “Elastic WOB” in figure 6 of [1], which is not mentioned or reported anywhere else in the study but commonly refers to the area bounded by the two lines representing the lung and chest wall elastance.

Instead, the study reports two other components of elastic work – “non-PEEPi elastic work” and “PEEPi elastic work” – without clearly explaining their physical meaning, how they are calculated from the measurements, or how they can be depicted in a Campbell diagram. Providing more detailed explanations would help readers better understand and correctly interpret the reported data.

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References

- 1 Ferreira JG, Iamonti VC, Caleffi Pereira M, *et al.* Differences of ventilatory muscle recruitment and work of breathing in COPD and interstitial lung disease during exercise: a comprehensive evaluation. *ERJ Open Res* 2024; 10: 00059-2023.



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Providing more detailed explanations would help readers better understand and correctly interpret the reported data <https://bit.ly/3N72niA>

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