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# The ventilatory efficiency and its clinical and prognostic value in cardiorespiratory disorders

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**Cardiopulmonary exercise testing has been increasingly recognised as a complementary and indispensable tool to assess the functional status, the response to interventions and the prognosis of patients with chronic respiratory and cardiac diseases** <https://bit.ly/3kzjHw8>

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Resting pulmonary function tests (PFTs) are of great diagnostic, discriminative and evaluative value in patients with suspected or established pulmonary disease [1]. Within PFT measurements, there is no doubt that forced expiratory volume in 1 s, forced vital capacity, diffusing capacity of the lung for carbon monoxide, and total lung capacity have stood the test of time and are widely used in clinical studies to judge the efficacy of pharmacological and non-pharmacological interventions in various chronic respiratory diseases [1, 2].

Although they remain widely used in assessing the efficacy of medical and surgical treatments in respiratory medicine, it has become clear that they do not always accurately predict prognosis in numerous respiratory and cardiac diseases and are unable to properly evaluate either the underlying physiological impairment [3] or the mechanisms that explain symptoms, such as dyspnoea and exercise intolerance [4]. This is why cardiopulmonary exercise testing (CPET) has been increasingly recognised as a complementary and indispensable tool to assess the functional status, response to interventions/treatments and prognosis of patients with chronic respiratory and cardiac diseases [3, 5, 6].

Within the CPET-related variables, there is no doubt that two are emerging due to their discriminative, evaluative, and prognostic value, *i.e.* inspiratory capacity and ventilatory efficiency indices (minute ventilation/carbon dioxide production slope and ratios).

In this new series published in the *European Respiratory Review* on behalf of the series editors, Pierantonio Laveneziana and Paolo Palange, and the *European Respiratory Review* Chief Editor, Yochai Adir, internationally recognised clinicians and researchers will share their expertise and knowledge on the topic of “the ventilatory efficiency and its clinical and prognostic value in cardiorespiratory disorders”. The series articles will focus on basic physiological concepts in healthy adults (including athletes, the elderly

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and pregnant women) to the clinical utility of CPET in the modern era in disease conditions, and within the latter it will highlight the clinical and prognostic utility of ventilatory efficiency in numerous cardiorespiratory diseases including asthma, obesity, cystic fibrosis, interstitial lung diseases, congenital heart disease, pulmonary vascular disease, chronic heart failure and COPD.

Conflict of interest: P. Laveneziana reports personal fees from Novartis France, Chiesi France and Boehringer France, outside the submitted work. Y. Adir has nothing to disclose. P. Palange has nothing to disclose.

## References

- 1 Cazzola M, MacNee W, Martinez FJ, *et al.* Outcomes for COPD pharmacological trials: from lung function to biomarkers. *Eur Respir J* 2008; 31: 416–469.
- 2 Laveneziana P, Albuquerque A, Aliverti A, *et al.* ERS statement on respiratory muscle testing at rest and during exercise. *Eur Respir J* 2019; 53: 1801214.
- 3 Puente-Maestu L, Palange P, Casaburi R, *et al.* Use of exercise testing in the evaluation of interventional efficacy: an official ERS statement. *Eur Respir J* 2016; 47: 429–460.
- 4 Laviolette L, Laveneziana P. Dyspnoea: a multidimensional and multidisciplinary approach. *Eur Respir J* 2014; 43: 1750–1762.
- 5 Palange P, Ward SA, Carlsen KH, *et al.* Recommendations on the use of exercise testing in clinical practice. *Eur Respir J* 2007; 29: 185–209.
- 6 Palange P, Laveneziana P, Neder JA, *et al.* eds. Clinical Exercise Testing. ERS Monograph. Sheffield, European Respiratory Society, 2018.