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From the authors:

The members of the European Respiratory Society Task Force on Exercise Testing in Clinical Practice have read with interest the letter from J.E. Cotes and J.W. Reed and are of the opinion that any response to the points raised therein should be placed in the context of the purpose of a recently published Task Force [1]. As stated in the introduction of this Task Force [1]: ''The purpose of this document is to present recommendations on the clinical use of exercise testing in patients with cardiopulmonary disease, with particular emphasis on the evidence base for functional evaluation, prognosis and assessment of interventions. While the scope of the document is broad, consideration will focus only on those indices which have demonstrable predictive power''. The key phrase here is ''evidence base'', which represents a clear departure from the objectives of the 1997 Task Force [2]. In recent years, there has been an accumulating body of evidence across a broad range of chronic lung and heart diseases (*e.g.* chronic obstructive pulmonary disease (COPD), interstitial lung disease (ILD), pulmonary vascular disease and chronic heart failure (CHF)) from studies using cycle ergometer protocols and field tests. It is upon this collective evidence base that the Task Force has formulated its recommendations for exercise testing in clinical practice.

Furthermore, the Task Force was written with the practicing clinician in mind, to raise awareness of the additional value of measuring exercise tolerance in clinical practice. That is, to ''allow resolution of practical issues that often confront the clinician, such as: 1) ''When should an evaluation of exercise intolerance be sought?''; 2) ''Which particular form of test should be asked for?''; and 3) ''What cluster of variables should be selected when evaluating prognosis for a particular disease or the effect of a particular intervention?'' [1]''. Therefore, it was expressly intended not to provide a high level of technical detail with respect to the design, implementation and interpretation of a cardiopulmonary exercise test (CPET) or a field-based walking test; other documents have done this successfully in the past [2, 3].

We believe that the Task Force report has addressed several of the ''new developments'' that have been highlighted by J.E. Cotes and J.W. Reed. These include: 1) the differences in patterns of physiological response between cycle ergometer exercise and walking that have been observed in COPD; 2) the influence of lung dynamic hyperinflation on dyspnoeic sensation and exercise intolerance, not only in pulmonary disease but also in heart disease; 3) the impact of particular exercise-based indices in prognostic evaluation, such as the slope of the minute ventilation (V'_E)–carbon dioxide output (V'_{CO_2}) relationship and the ventilatory equivalent for carbon dioxide (V'_E/V'_{CO_2}) at the lactate threshold during incremental cycle ergometry in CHF patients, and arterial oxygen desaturation during walking tests in patients with ILD; and 4) the utility of high-intensity, constant work-rate ''endurance'' cycle ergometer protocols for assessing the effects of interventions

Regarding the recommendation that J.E. Cotes and J.W. Reed make concerning terminology, we suggest that there are generic aspects of exercise-test design and analysis that should be common to evaluation of the pulmonary and cardiac patient. The use to which these are subsequently put is, of

course, another matter. That is, CPET is a test modality, the fundamental purpose of which is to gradationally stress the physiological systems that have the potential to contribute to exercise intolerance in a patient.

With regard to the comment concerning exercise modality, the Task Force report has clearly addressed the issue of possible differences in the ventilatory and metabolic responses for cycle ergometry and shuttle walking in COPD [4, 5]. Furthermore, based on the available literature, the use of walking tests has been recommended for assessing the degree of arterial oxygen desaturation in patients with ILD. However, as treadmill protocols have not yet been used extensively for prognostic evaluation or for the assessment of interventions, the Task Force is of the opinion that it is not possible to formulate evidence-based recommendations for their use in clinical practice at this time.

In response to the issue of which measurements are essential, the Task Force report has clearly indicated those parameters and indices which have demonstrated a particular utility in: 1) functional evaluation, such as peak oxygen uptake ($V'_{O_2,peak}$); 2) prognostic evaluation, such as $V'_{O_2,peak}$ and V'_E/V'_{CO_2}; and 3) the evaluation of interventions, such as endurance time and ''iso-time'' measurements (*e.g.* ventilation, inspiratory capacity) during high-intensity, constant work-rate protocols.

With regard to the final point, again the Task Force report clearly states that measurement of the ventilatory response in exercise is an essential part of the functional and prognostic evaluation of patients with chronic lung and heart diseases and, if necessary, should be obtained in specialist centres.

J.E. Cotes and J.W. Reed suggest the use of V'_E at an oxygen uptake (V'_{O_2}) of 1 L·min^{-1} ($V'_{E,st}$) as an appropriate and informative index of what they term the ''ventilatory burden'' of patients with lung disease. We feel that this deserves comment. This is because it provides what amounts to a single, and arbitrary, value on the profile of the ventilatory equivalent for oxygen (V'_E/V'_{O_2}), the pattern of which is neither linear nor monotonic during exercise. Some subjects with lung disease (and, of course, normal but sedentary, and especially elderly, subjects) could be below the threshold of metabolic acidosis at a V'_{O_2} of 1 L·min^{-1}, whereas others could be above the threshold. The value of $V'_{E,st}$ could, therefore, disguise important functional differences of V'_E response. Using V'_{CO_2} as the frame of reference overcomes many, although not all, of these concerns. The V'_E–V'_{CO_2} relationship has been consistently demonstrated to be highly linear up to the respiratory compensation point and consequently, using either its linear characteristics or the minimum value of V'_E/V'_{CO_2} (a justifiable physiological index reflecting the onset of respiratory compensation for the metabolic acidosis) is, we contend, more consonant with its physiological determinants.

In conclusion, we would like to thank J.E. Cotes and J.W. Reed for opening up a range of issues for debate that relate to clinical exercise testing. We hope that our responses to those that fall within the scope of the Task Force report are found to be constructive.

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STATEMENT OF INTEREST

None declared.

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Hot and cold biopsy: implications of study design on outcomes

To the Editors:

We read with interest the article in the *European Respiratory Journal* by TREMBLAY *et al.* [1], wherein the authors conclude that the use of hot biopsy forceps for endobronchial biopsy does not appear to have a negative impact on the pathological samples, and that there was a statistically significant (albeit clinically insignificant) reduction in bleeding score with hot biopsy forceps. However, many of the conclusions of the study have limitations because of the study design of alternate hot and cold biopsies.

The authors state that the quantification of bleeding was carried out and recorded by the bronchoscopists between each biopsy on a four-point scale. However, the interval between the two