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What the 4-metre gait speed measures and why it cannot replace functional capacity tests

To the Editor:

In a recent issue of the *European Respiratory Journal*, KON *et al.* [1] explored the responsiveness of the 4-m gait speed (4MGS) test to pulmonary rehabilitation and provided its longitudinal modifications in a sample of chronic obstructive pulmonary disease (COPD) patients. That article may be considered complementary to a previous one published by the same group of authors a few months ago, in which the reliability and validity of the physical performance test were determined in older persons referred to an outpatient respiratory clinic [2]. Consistent with previous evidence from different medical specialties and settings [3], the 4MGS was confirmed to be a robust, clinically friendly instrument capable of improving the patient's assessment and monitoring over time. We strongly believe that both studies by KON and co-workers [1, 2] are extremely interesting and meritorious for proposing the widely studied 4MGS test in the field of respiratory medicine. Nevertheless, in both contributions, the authors tend to present the 4MGS as an alternative to endurance/functional capacity walking tests currently used in respiratory medicine (*i.e.* the 6-min walking test (6MWT) and the incremental shuttle walk (ISW)) by indicating “learning effects” and the need for space as primary limitations of these. We strongly disagree with these statements because such parallelism is mainly unfair and potentially flawed from a methodological viewpoint. It is like considering, for example, the heart rate assessment as an alternative to a stress ECG just because it is easier, more convenient and still clinically informative.

The designs of the 6MWT, ISW and 4MGS are responsive to completely different aims. The 6MWT and the ISW stress the cardiorespiratory capacities of the individual in order to quantify their physiological reserves and exercise tolerance. The results indicate the capacity of the subject to cope with challenging and prolonged stressors. Moreover, it is noteworthy that both the 6MWT and the ISW have no established goal of distance to cover (*i.e.* the subject walks as far as they can). In contrast, the 4MGS test is conducted at the individual's usual pace over a short track with the only objective of obtaining a measure of physical performance under comfortable conditions. Here, although the goal (*i.e.* crossing the 4-m finish line on the floor) may be veiled to the patients, the nature of the test makes it unlikely push them to the limit of their physiological reserves.

During the last two decades, the increasingly demonstrated capacity of the usual gait speed to predict major health-related events in older persons [4] and its strong relationships with key pathophysiological mechanisms of ageing [5] have made this tool of particular interest in the clinical setting. It is now well established that gait speed should not be considered a mere measure of mobility, but indeed represents a more global marker of well-being. Not surprisingly, gait speed has been repeatedly indicated as a potential additional “vital sign” specific to older persons [5–7]. In other words, the 4MGS results may resemble those obtained in the clinical setting when measuring the basal respiratory rate, heart rate, temperature or blood pressure.

By taking into account its strengths (*i.e.* ease of assessment and implementation, objectivity, reliability and inexpensiveness) and weaknesses (*i.e.* being potentially affected by a wide spectrum of confounders, abnormal results possibly having heterogeneous explanations, and arguable use as primary outcome in the clinical and research settings), we believe that the 4MGS represents a useful screening tool to grossly

distinguish “biologically” *versus* “chronologically” aged individuals [6]. Thus, its strong correlations with respiratory parameters [2] and its sensitivity to clinical modifications [1] should only be seen as additional evidence of the strong biological foundations of the test, even in a disease-specific population. Nevertheless, in no way may such characteristics allow it to substitute tests measuring specific capacities and functions.

In the current clinical scenario characterised by a growing number of older persons, the use of the 4MGS has an extremely high relevance. The stratification of older persons according to such an additional objective “vital sign” implies the possibility of developing a new model of patient-tailored healthcare systems. In this way, slow walkers, rather than persons aged ≥ 65 years, may become those considered more vulnerable to endogenous and exogenous stressors and amenable to adapted interventions (following a comprehensive geriatric assessment). It may provide the basis for distinguishing the “geriatric patient” according to a biological parameter rather than through a mere chronological (and extremely limited) criterion such as age. It is noteworthy that such use of the gait speed test for screening older persons in the need for a more detailed comprehensive evaluation (and subsequent potentially adapted interventions) has already been proposed in other medical specialities, for example in cardiac surgery [8] and oncology [9]. The role of the 4MGS in the screening of older persons (and now even among COPD patients) is methodologically different from that of the 6MWT and ISW. The endurance walk tests maintain their clinical relevance and cannot be replaced by the 4MGS in the specific assessment of cardiorespiratory capacity.

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The role of the 4MGS in the screening of older persons is methodologically different from that of the 6MWT and ISW <http://ow.ly/rT7ed>

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From the authors:

We are greatly honoured by the interest shown by M. Cesari and S. Scarlata in our recent publications on the 4-m gait speed (4MGS) in patients with chronic obstructive pulmonary disease (COPD) [1, 2]. We strongly agree with their view that the 4MGS has value as a “vital sign”, a “marker of global well-being” and reflects biological (rather than chronological) age. Gait speed has been shown to be a strong and consistent risk factor for adverse outcomes including disability, nursing home admission, falls and mortality in community dwelling older persons [3, 4]. The intention of our studies was to draw the attention of the respiratory fraternity to the 4MGS, as we believe that the 4MGS may have a future role in stratifying patients