



## A 4-Min Self-Paced Step Test For Disability Assessment In Patients With Pulmonary Arterial Hypertension

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**Rationale:** The 6-min waking test (6MWT) has been widely used to assess exercise tolerance in patients with pulmonary arterial hypertension (PAH). However, the test requires large space to be performed, careful standardization and might be poorly responsive to interventions in less disabled patients. A shorter (4 min), more demanding and portable test (single-level stepping, 4MST) could constitute a clinically-attractive alternative for these patients. **Methods:** 25 patients with established PAH (NYHA class II-III, peak  $\text{VO}_2 = 68.4 \pm 19.3$  % predicted) performed, on different days: (i) a rapidly-incremental test on a motorized treadmill, (ii) two 6MWT and (iii) two 4MST with cardiopulmonary variables being recorded on a portable system (Oxycon Mobile™, Jaeger, Germany). **Results:** All patients successfully completed both tests. Test-retest reproducibility was superior for the 4 MST compared to 6 MWT ( $r=0.88$  and  $r=0.67$ , respectively). The 4 MST was associated with near-maximum metabolic, ventilatory, cardiovascular and sensorial stresses which were significantly higher than those elicited by the 6MWT ( $p<0.05$ ). The number of steps climbed in the 4 MST was well correlated with the distance walked in the 6 MWT ( $r=0.72$ ;  $p<0.01$ ). Therefore, no patient who climbed less than 75 steps walked more than 450 m; in addition, only 4/17 patients who climbed more than 75 steps had a decreased walking capacity. Seven patients did not present with a significant drop in  $\text{SpO}_2$  ( $>4\%$ ) in both tests; in addition, severity of  $\text{SpO}_2$  decrease was remarkably similar in the other 18 patients ( $p>0.05$ ). **Conclusions:** The 4 MST is a clinically-feasible and reproducible field test to assess exercise tolerance and gas exchange impairment in patients with PAH.

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