

Efficacy of lower-limb muscle training modalities in severely dyspnoeic individuals with COPD and quadriceps muscle weakness: response from the authors

We thank Chaplin and Latimer for their interest in the DICES study.¹ The correspondents question the validity of the power calculation, and in turn, state that we cannot conclude that high-frequency neuromuscular electrical stimulation (HF-NMES) and strength training have equivalent effects in severely dyspnoeic patients with COPD and quadriceps muscle weakness at baseline.¹ At the time of the start of the preparations of the DICES study in September 2009, we were not able to find statistical formulas where results from studies comparing two groups can be used for power calculations for three groups. Therefore, for the initial power calculation, we have used a power calculation of two groups to estimate the sample size for a three-arm study design. Initially, we did not expect a difference in change in isokinetic quadriceps peak torque between HF-NMES and strength training. A posteriori analyses revealed that an extra ± 15 patients per group would be needed to detect a significant difference for the primary outcome, with HF-NMES being superior. To conclude, future trials are needed to investigate optimal strategies for exercise training in pulmonary rehabilitation for specific subgroups of patients with COPD, to enable development of exercise guidelines.² Based on the results of the DICES study,¹ we still believe that HF-NMES may be a good alternative for strength training in severely dyspnoeic COPD patients with quadriceps muscle weakness.

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Contributors Trial concept and design: MJHS, EFMW and MAS; acquisition of data: MJHS, JMLD, AWV; analysis and interpretation of data, and drafting the

article: MJHS, FMEF and MAS; revising it critically for important intellectual content and final approval of the version to be published: all authors. MJHS had full access to all trial data and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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- 2 Spruit MA, Singh SJ, Garvey C, *et al.* An Official American Thoracic Society/European Respiratory Society Statement: key concepts and advances in pulmonary rehabilitation. *Am J Respir Crit Care Med* 2013;**188**:e13–64.