

Postprint version :
Journal website : https://journals.lww.com/pedpt/Citation/2019/04000/Commentary_on_Cardiopulmonary_Exercise_Test_Using.16.aspx
Pubmed link : <https://www.ncbi.nlm.nih.gov/pubmed/30907837>
DOI : 10.1097/PEP.0000000000000600

This is a Nivel certified Post Print, more info at nivel.nl

Commentary on "Cardiopulmonary Exercise Test Using Arm Ergometry in Children With Spina Bifida: A Prediction Model for O2peak

de Groot, Janke F. PT, PhD; Sol, Marleen PPT, MSc

Netherlands Institute for Healthcare Services Research (NIVEL) and HU University of Applied Sciences Utrecht, the Netherlands

De Hoogstraat Rehabilitation and HU University of Applied Sciences Utrecht, the Netherlands

The authors declare no conflicts of interest.

"How should I apply this information?"

This study provides first evidence toward a model to predict O2peak from watts using arm ergometry in children with spina bifida. As is increasingly being recognized, levels of aerobic fitness and physical activity in children using a wheelchair are often low, putting them at risk for unfavorable health outcomes. Therefore, the development of aerobic exercise testing for this group is desirable for clinical practice; this allows for evaluation and development of personalized exercise and/or activity programs. The feasibility of exercise testing in pediatric physical therapy improves when O2peak does not have to be measured using gas analysis, but can be predicted from easily accessible outcomes such as watts.

"What should I be mindful about in applying this information?"

This field of exercise testing in youth who use a wheelchair is relatively new and many questions remain regarding the best mode of exercise testing. The review by Goosey-Tolfrey and Leicht¹ questions the validity of arm-cranking protocols, as they may lack specificity of testing. This is confirmed by a more recent review by Baumgart et al,² which concludes that functional wheelchair propulsion exercise testing yields higher outcomes of exercise testing. Recent studies^{3,4} support higher O2peak and cardiorespiratory outcomes with functional wheelchair ergometry and/or field testing in children. While functional modes of exercise testing seem to result in higher

O2peak, there may be practical and logistical reasons to use arm ergometry (eg, the availability of space, exercise equipment, and good wheelchairs), as functional exercise testing is a reflection of the person-wheelchair interaction. In addition, the prediction model for O2peak for wheelchair propulsion testing is not as good as the model presented in this study and requires the use of a gas analysis system for assessment of O2peak. As the authors state, the model from this study was validated in a small sample and further validation is recommended.

REFERENCES

1. Goosey-Tolfrey VL, Leicht CA. Field-based physiological testing of wheelchair athletes. *Sports Med*. 2013;43:77-91. [Bibliographic Links](#)
2. Baumgart JK, Brurok B, Sandbakk O. Peak oxygen uptake in paralympic sitting sports: a systematic literature review, meta- and pooled-data analysis. *PLoS One*. 2018;13(2):e0192903.
3. Bloemen MA, de Groot JF, Backx FJ, Westerveld RA, Takken T. Arm cranking versus wheelchair propulsion for testing aerobic fitness in participants with spina bifida who are wheelchair dependent. *J Rehabil Med*. 2015;47(5):432-437.
4. Verschuren O, Zwinkels M, Ketelaar M, Reijnder-van Son F, Takken T. Reproducibility and validity of the 10-meter shuttle ride test in wheelchair-bound children and adolescents with cerebral palsy. *Phys Ther*. 2013;93:967-974.