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PhD in Gerontological Sciences  
2019-2020

INVITATION to the Public defence of

**Liza DE DOBBELEER**

To obtain the academic degree of '**DOCTOR OF GERONTOLOGICAL SCIENCES**'

**Muscle fatigability in ageing: Influence of measurement system and clinical status**

The defence will take place digitally on

Tuesday, 18 August 2020 at 5 p.m.

via Zoom meeting, accessible through the following link:

[https://gf.vub.ac.be/redirects/PhD\\_defense\\_Liza\\_De\\_Dobbeleer.php](https://gf.vub.ac.be/redirects/PhD_defense_Liza_De_Dobbeleer.php)

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## Summary of the dissertation

Ageing is accompanied with a gradual decline in physical reserve capacity, but in frailty this decline is accelerated and homeostatic mechanisms start failing. Frailty is characterized by a decrease in resistance to endogenous and exogenous stressors, and an increased risk of adverse health outcomes such as falls, hospitalization, diminished mobility, increasing disability in activities of daily living and ultimately premature death. Previously, the fatigue resistance (FR) test was designed for elderly and frail persons, based on maintaining maximal voluntary grip strength as long as possible in order to objectify muscle fatigability, a proxy of the physical reserve capacity. This doctoral thesis aimed to investigate if muscle fatigability can be equally measured with a pneumatic and a hydraulic system in cohorts of different ages and clinical conditions, as well as what the contribution is of age and clinical condition on the pattern of the strength decay during the FR test measured with both systems. Participants were unable to sustain the FR test with a hydraulic system as long as with a pneumatic system. It seems that a pneumatic system is a more appropriate handgrip system compared to a hydraulic. Moreover hospitalized geriatric patients, compared to old controls, showed a particularly rapid decline during the first 25% grip strength decay when using a pneumatic system, but not when using a hydraulic system. Based on the results described in this doctoral thesis, muscle fatigability measured with a pneumatic system has the preference in a clinical setting and it might be a good additional marker to include in a comprehensive geriatric or frailty assessment.

## Curriculum Vitae

Liza De Dobbeleer was born on the 2nd of May 1990 in Anderlecht, Belgium. After finishing high school at the Atheneum Halle in 2008, she started studying physiotherapy, with specialization geriatrics, at the Faculty of Physical Education and Physical Therapy at the Vrije Universiteit Brussel (VUB). She wrote her thesis on self-perceived fatigue and muscle fatigue in relation to inflammation in elective surgery patients aged 60 and over, under the supervision of Prof. Dr. Ivan Bautmans. In 2013, she received her Master's degree in physiotherapy with great distinction, with specialization geriatrics. Her thesis research sparked her interest in doing scientific research and therefore she applied as a PhD student at the VUB. She started a PhD project which is titled: 'Muscle fatigability in ageing: influence of measurement system and clinical status' under supervision of Prof. Dr. Ivan Bautmans (promotor) and Prof. Dr. Ingo Beyer (co-promotor). This PhD project resulted in the present dissertation. During her PhD trajectory as teacher and research assistant in Gerontology, Liza also worked as physiotherapist at the Universitair Ziekenhuis Brussel, as member of the intern geriatric liaison team. Meanwhile she married Tom Debie in 2018 and in 2019 became a proud mum of a fantastic son, Vince Debie.