

# Reply to “Clinical assessment of upper limb impairments and functional capacity in Parkinson’s disease”: defining upper limb functional capacity in people with Parkinson’s disease

## *Resposta à “Avaliação clínica de comprometimentos de membros superiores e capacidade funcional na doença de Parkinson”: definindo a capacidade funcional dos membros superiores em pessoas com doença de Parkinson*

Tamine T. C. Capato<sup>1,2</sup> Rubens G. Cury<sup>1</sup> Rúbia Rodrigues<sup>1</sup> Manoel Jacobsen Teixeira<sup>3</sup>  
Egberto R. Barbosa<sup>1</sup>

<sup>1</sup> Universidade de São Paulo, Faculdade de Medicina, Departamento de Neurologia, Centro de Distúrbios do Movimento, São Paulo SP, Brazil.

<sup>2</sup> Radboud University Medical Centre, Donders Institute for Brain, Cognition and Behavior, Department of Neurology, Nijmegen, The Netherlands.

<sup>3</sup> Universidade de São Paulo, Departamento de Neurocirurgia, São Paulo SP, Brazil.

**Address for correspondence** Tamine T.C. Capato  
(email: taminec@usp.br).

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Dear Editor,

We appreciate the insightful remarks from our colleagues on our use of the term “functional capacity” in our manuscript in *Arquivos de Neuro-Psiquiatria*.<sup>1,2</sup> We concur that employing transparent terminology to discuss a frequently neglected aspect of Parkinson’s disease (PD) management – the assessment of upper limb functional capacity – is important in the clinical discourse on movement disorders. Functional capacity generally refers to the ability to carry out necessary or desirable tasks under specific conditions.<sup>3</sup> We employ the term “upper limb functional capacity in PD” specifically to denote the ability to execute normative functional activities in daily life, including work-related tasks. Our definition is grounded in both the World Health Organization’s (WHO) International Classification of Function, Disability, and Health (ICF)<sup>4</sup> and the European Physiotherapy Guideline for Parkinson’s Disease.<sup>5,6</sup> The assessment of upper

limb functional capacity in PD should encompass activity levels and level of participation and take into account limitations and disability levels caused by both motor and non-motor symptoms and medication states (on and off).

Despite optimal treatment, the symptoms of PD inevitably progress, leading to disability in daily activities.<sup>7</sup> As such, one of the highest priorities in managing PD is delaying and preventing such disability.<sup>4</sup> To maintain upper limb function, it is vital to understand the relationship between various PD symptoms and the resulting disability. This understanding is crucial to minimize functional limitations.<sup>7</sup> In clinical practice, we commonly obtain objective, quantitative data on upper limb functional capacity via physical performance measures (including body functions and structures) or through simulations of daily activities. These strategies allow us to gauge the interaction of activity and participation with personal and environmental factors.<sup>4,5,8</sup>

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In this discussion, we further explore the clinical implications of upper limb functional capacity. As previously discussed, this area demands greater attention in future research. PD is complex and multi-faceted, influencing all aspects of affected individuals' lives. It is crucial to understand the relationship between PD's varied symptoms and rising disability to limit the impact on functional capacity.<sup>7</sup> Our manuscript underscores the significance of comprehending and applying upper limb functional capacity assessments when caring for individuals with PD. As we understand it, healthcare professionals specializing in movement disorders should conduct this assessment. It involves an assortment of tests and scales, practices, and observations to gauge the subject's functionality in varied circumstances. This includes necessary physical, cognitive, and emotional functions for daily activities (ADLs), work, social interactions, and leisure pursuits.

Limited clinical evidence suggests that decreased upper limb functional capacity hampers daily activities in PD.<sup>8</sup> The effects of PD-related motor symptoms like tremors, bradykinesia, rigidity, and freezing in upper limbs on tasks involving hand dexterity – such as typing on the computer or mobile phone, writing, or dressing – are documented only by few studies.<sup>8</sup> The extent of these functional limitations could be tied to:

- the severity of PD's motor and non-motor symptoms at all stages;
- the medication state (on/off) and side effects;
- the progressive worsening of symptoms that affect upper limb function over time; and
- the subsequent loss of independence, restricted work and social participation, thus decreasing the quality of life.<sup>4</sup>

As specialists in movement disorders, we aim to explore how the lack of specific measures to assess upper limb functional capacity in PD impacts the clinical prognosis. This is especially important for optimizing pharmacological, surgical, and non-pharmacological rehabilitation treatment strategies and for improving the quality of life in individuals living with PD.

To clarify, the measures taken to mitigate language bias in our study design are documented in our manuscript, including our use of the PubMed database for search purposes. These limitations are addressed in the inclusion criteria and methodology sections.<sup>9</sup> In line with the PRISMA

checklist,<sup>10</sup> we performed a search on the rigorous Physiotherapy Evidence Database (PEDro, [www.pedro.org.au](http://www.pedro.org.au)) to minimize selection bias. This step was detailed in the methodology, although its presentation could have been clearer. Our PEDro search resulted in an additional 12 source articles shown in the flow diagram.<sup>1</sup> In-depth information about these sources is documented<sup>1</sup> such as an overview, characteristics, and specific outcomes of the studies, including the number of participants of each study (in total,  $n = 2239$ ).

#### Authors' Contributions

All authors contributed to the article and approved the submitted version.

#### Conflict of Interest

There is no conflict of interest to declare.

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