Rehabilitation assisted by robotic and electro-mechanical devices for persons with neurological disabilities: an Italian consensus conference

Dear Editor,

The past two decades have seen an increase in the use of robotic technology in rehabilitation, and a further significant expansion is expected in the coming years.

Although their distribution is currently not homogeneous, more and more robotic devices for rehabilitation purposes are now available in several clinical settings. This is borne out by published clinical studies on the use of robotic technologies in rehabilitation, especially of individuals with neurological disabilities (i.e., stroke, spinal cord injury, neurodegenerative diseases). Over the past five years, by far the largest percentage of published studies on the rehabilitation of persons with stroke and spinal cord injury has involved the use of these devices, also in association with other types of intervention, and confirmation of their usefulness is now starting to come from systematic reviews (Carvalho et al., 2017; Louie et al., 2015; Mehrholz et al., 2012, 2017, 2018).

The recent (2018) Italian Ministry of Health review of "essential levels of health care" (Livelli Essenziali di Assistenza) confirms the significant role of these technologies, which have now been included in the list of official rehabilitation therapies provided by the Italian National Health System.

Despite this, there exist significant dissimilarities and discrepancies with regard to patient eligibility criteria, the effectiveness of treatments based on these devices, and their economic impact, organizational issues and outcome evaluation (Geroin et al., 2018; Lo et al., 2019).

There is currently no common overall framework able to clarify the different aspects that need to be taken into account when seeking to integrate these technologies into rehabilitation settings in a way that is effective, safe and acceptable to all patients (Fisahn et al., 2016; Koumpouros, 2016).

The Italian Society of Physical and Rehabilitation Medicine (SIMFER) and the Italian Society of Neurological Rehabilitation (SIRN) have promoted the organization of a National Consensus Conference (CC), named "Cicerone", which is due to present its final report in mid-2020.

The CC method was considered one of the most appropriate ways to tackle the question of rehabilitation assisted by robotic and electromechanical devices for persons with neurological disabilities, a complex problem whose implications extend far beyond the clinical context.

The general purpose of this CC is to identify recommendations on different aspects of the use of robotic and electromechanical devices in the rehabilitation of persons with neurological disabilities. In particular, the recommendations will include:
• definitions and criteria for the classification of these devices
• indications on the clinical use of these devices in neurological disabilities
• theoretical models for the development and clinical use of these devices
• appropriate healthcare organizational models for the optimal use of the devices
• regulatory aspects, and ethical and legal implications of the use of these devices.

The Cicerone CC is expected to provide relevant insights and recommendations on the use of robotic and electromechanical devices for neurorehabilitation, which currently represent promising and challenging technologies potentially able to help reduce impairment, enhance activities of daily living and, ultimately, improve the quality of life of persons with disabilities.

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