

December 5, 2020

## Post-COVID syndrome

### *Technology to rehabilitate neuromotor deficits following COVID-19*

*More than 50% of physiatrist evaluated COVID-19 patients at the "Luigi Sacco" Hospital in Milan require rehabilitation treatment for neurological, muscular and neuromotor impairments secondary to their SARS-CoV-2 infections.*

*Under the direction of Dr. Arnaldo Andreoli of Luigi Sacco Hospital - ASST Fatebenefratelli Sacco - in Milan, data was collected by the Operative Unit of Specialized Rehabilitation physiatrists.*

*Offering patients access to targeted rehabilitation treatment using innovative technological equipment, a new Robotic Evaluation and Rehabilitation Project will be launched using the robotic device **hunova** and associated Telemonitoring and Telerehabilitation*

December 2020 - In recent weeks the international scientific literature<sup>1,2</sup> has increasingly highlighted the phenomenon of "**post-COVID-19 syndrome**": characterized by neurological<sup>3</sup>, muscular, respiratory, cognitive and motor symptoms, which may persist for more than six months. The experience of the rehabilitation *team* of the "Luigi Sacco" Hospital in Milan has confirmed this syndrome, documenting neuromotor rehabilitation needs in more than 50% of patients treated.

Using high- tech equipment<sup>4</sup>, the team of the *Operative Unit of Specialized Rehabilitation of the "Luigi Sacco" Hospital in Milan*, in collaboration with the *Department of Electronics, Information and Bioengineering of the Polytechnic of Milan* and the *Orthesys Motion Analysis Laboratory*, evaluated an initial group of post-COVID patients with an average age of 53 years who required intensive care.

The data collected through this *Pilot Study* showed that:

1. *Is there a post-COVID syndrome? Bernd Lamprecht. Pneumologie (Berl) 2020 Oct 8;1-4. doi: 10.1007/s10405-020-00347-0.*
2. *Covid-19 and Post Intensive Care Syndrome: A Call for Action, Henk J Stam 1 , Gerold Stucki, Jerome Bickenbach, J Rehabil Med. 2020 Apr 15;52.*
3. *Implicazioni neurologiche dell'infezione da nuovo Corona-virus SARS-CoV-2. Rossella Pagani. Medici Oggi. 2020 Mar 24.*
4. *Ghioni et al. Inquadramento clinico-strumentale dei pazienti con disabilità conseguente a COVID-19. Poster accettato al 48° Congresso Nazionale SIMFER. 2-4 dicembre 2020.*

- In **80%** of patients evaluated, there was evidence of reduced hip, knee, and ankle motility on both lower limbs, which may result from muscle weakness (*hyposthenia*), joint limitations resulting from immobility, or peripheral or central neurologic problems.
- **90%** of patients evaluated demonstrated decreased strength at the ankle joint, with worsened gait quality and increased risk of stumbling and falling.
- **50%** of patients showed an asymmetry in strength between the right and left lower limbs, affecting the safety of walking.

To investigate the relevance of the "**post-COVID-19 Syndrome**", involving the neuromuscular system, and to define rehabilitation treatment protocols, Dr. Andreoli's rehabilitation team at the "**Luigi Sacco**" **Hospital**, in collaboration with **Movendo Technology**, will initiate a Project of screening and robotic treatment with the **hunova** device. This technology allows a *robotic evaluation* of the patient's neuromotor functions, while providing a *targeted rehabilitation therapy*, based on objective data.

The project will combine the clinical evaluations of the physiatrist, the physiotherapy sessions, the exercises performed by the patient at home and the treatments with the high-tech robotic device **hunova**. This combination will allow for personalized rehabilitation treatments to address the disabling neuromotor consequences of the SARS-CoV-2 infection, characteristic of the "**post-COVID syndrome**".

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