

I would like to thank Dr. Jorge Villafañe for the thorough evaluation and interest in my Doctoral dissertation. Given below are the answers to the specific questions raised by the Reviewer and responses to their suggestions.

All the suggestions have been considered and the manuscript was changed accordingly. All the other comments are discussed below.

Sincerely,

Michela Di Girolamo

Title Could you change the title. Does not respond to the results.	Unfortunately the title cannot be changed because it has been approved by the tutors in relation to the thesis submission process.
Abstract	
Aim. Could you change “context” by setting.	The change has been applied
Method: procedures: described in brief, b) Add the data analysis; c) could you describe the Outcome periods; and d) type of study.	The method paragraph has been modified as follow: The device and the related software employed in the present research have been specifically conceived with this purpose. The device has been optimize during a clinical pilot study and then, a complete clinical trial has been started to investigate the characteristics of post stroke patients eligible for a rehabilitation therapy with the device and the short-term clinical effect of the therapy on the recovery of the hand functionality. A statistical analysis has been performed on the dataset collected during 3 months, from July until the time of writing, which is October. The data analysis included both clinical data and data collected from patients with the device during the execution of the experimental protocol.
Result: a) The first sentence could be delete; b) Could you report P value significant, please, f) could you define the intervention period (how long?)	The result paragraph has been modified as follow: The preliminary results of the data analysis has confirmed the suitability of the system for its intended use and highlighted that the patient ability of controlling the EMG-BF based device is related to the degree of impairment with p-value <0.001 depending on the patient clinical picture and on the exercise performed. Moreover, according preliminary results observed on four patients that received a 15 hours therapy during 3 weeks, the improvement of the parameters related to the hand and fingers motor function, suggests the efficacy of the therapy. Finally, aspects related to the analysis of continuous motions of the wrist performed during the therapy have been investigated and the relevance of the temporal information in the interpretation of this type of movements has been

	revealed ($p < 0.01$).
Contents: 1, 2 and 3	
Could you use the recent bibliography?	Chapter 1 summarizes well-established muscle physiology concepts. The bibliography of this chapter has been selected giving priority to worthy sources rather than to most recent sources. The bibliography of Chapter 2 has been updated with the following references: • F. M. Ivey, S. J. Prior, C. E. Hafer-macko, L. I. Katzel, R. F. Macko, and A. S. Ryan, "Strength Training for Skeletal Muscle Endurance after Stroke," J. Stroke Cerebrovasc. Dis., no. 18, pp. 1–8, 2016. • G. Kwakkel, J. M. Veerbeek, E. E. H. Van Wegen, and S. L. Wolf, "Constraint-induced movement therapy after stroke," Lancet Neurol., vol. 14, no. 2, pp. 224–234, 2015. • C. Kuo and G. Hu, "Post-stroke Spasticity: A Review of Epidemiology, Pathophysiology and Treatments," Int. J. Gerontol., vol. 12, no. 4, pp. 280–284, 2018. • K. H. Cho and W. Song, "Robot-Assisted Reach Training for Improving Upper Extremity Function of Chronic Stroke," pp. 149–155, 2015. • M. Kamkarhaghighi, P. Mirza-babaei, and K. El-Khatib, "Game-Based Stroke Rehabilitation," in Recent Advances in Technologies for Inclusive Well-Being, Springer, Ed. 2017, pp. 147–162. • D. Sharma, M. F. Ck, F. Khan, and R. A. Gaowgzeh, "Effectiveness of knowledge of result and knowledge of performance in the learning of a skilled motor activity by healthy young adults," no. May, 2016. • D. Sharma, "Knowledge of Result Versus Knowledge of Performance in Learning Motor Skilled Activity for Upper Limb in Recovery Stage of Stroke – A Randomized Experimental Study Randomized Experimental Study," no. September, pp. 3–6, 2016. • JU-HONG KIM, "The effects of training using EMG biofeedback on stroke patients upper extremity functions," J. Phys. Ther. Sci., pp. 1085–1088, 2017. Chapter 3 includes legal references, that have not been changed since they were adopted at EU.
Please add a hypothesis at the end of the	Thank you for the suggestion. The thesis structure has been

introduction.	slightly modified and the Chapter 4 has been replaced with the Hypotheses and aims Chapter. As the main consequence, the following Chapters' numbers have been modified
4.2 Clinical pilot study	
What about the possibility that the stroke altered muscle-based sensation on the affected side?	The aim of the proposed rehabilitation protocol is the recovery of hand and wrist functionalities for the execution of specific tasks, with an EMG-BF based system that closes the sensory-motor loop. The system itself allows then to evaluate the correspondence between the patient muscle-based sensation and the performed movements. Moreover, the protocol has been planned by experienced rehabilitation therapists according to the rehabilitation standard protocols
please explain why these were the primary muscles assessed.	The electrode configuration allowed the acquisition of the sEMG activity of extensor and flexor muscles of the forearm, that make a fundamental contribution to the movement and to the dexterity of the human hand and wrist and to the motor functionalities that the clinical pilot study is intended to rehabilitate. This explanation has been added in the text, in the section of the experimental and setup protocol, paragraph 5.2.
Statistical data: What statistical package has been used?	GraphPad Prism 5 has been used. The information has been included in the text.
Need to editing/reformulate the results. Please, don't use references in the result section.	References have been deleted
Could you add the Demographics of the participants section?: the paragraph could be written to one short sentence. If includes data distribution and range in the table, the text can just refer to table.	The section has been added
Study protocol	
Need to editing/reformulate the study protocol. Deleted the aim or create a new section (5.1.2 aim).	The aim has been deleted as it is already declared in previous sections
Please, don't use references in this section (ei [121, 122]).	Thank you for this suggestion. Nevertheless, the references are included to explain and motivate the clinical assessment scales used in the protocol. They are included in the paragraph where parameters are detailed in order to avoid redundancy.
5.1.5 Statistical analysis	GraphPad Prism 5 has been used. The information has been

What statistical package has been used?	included in the text.
Participants	
There should not use 2 decimal in the age value	Decimals have been deleted
Please change to "subject" to "patient" if applicable.	The changed has been performed, when applicable.
6.1 Experimental Setup and Protocol. Table XX. Could you add the consequential number?	The sequential number corresponding to the movements has been added in the table
6.4 Conclusion Please, don't use references in the conclusion section.	References have been deleted