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An alternate rehabilitation for stroke: The myoelectric computer interface

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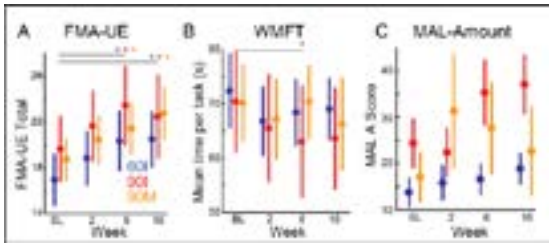
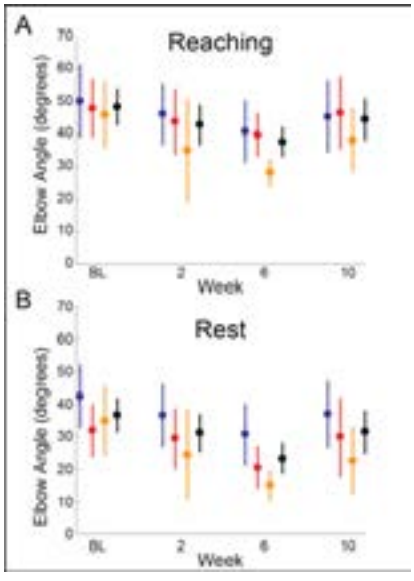
Abnormal coactivation patterns of arm muscles is a significant cause of impaired arm function after stroke. In our previous study, the Myoelectric Computer Interface (MCI) training paradigm was designed to help stroke survivors reduce this abnormal coactivation. The impacts that MCI training had on function and arm kinematics in 32 chronic stroke survivors were evaluated, and the results suggested that MCI training could potentially improve post-stroke arm function. The MCI training system in the previous study produced biofeedback for a single muscle pair. Now, we have designed a new paradigm with a biofeedback system returning feedback for three muscles at once and a sham paradigm to act as a control group. We are comparing patients using the original MCI paradigm and both of our new MCI systems, all over a six week period. We hypothesize that the original paradigm will still be effective in reducing coactivation, the sham paradigm will not be effective in reducing coactivation, and the three-muscle paradigm will be more effective in reducing coactivation than the original paradigm.





	FMA-UE	WMFT (s/task)	MAL
60I	3.4±2.8	-4.0	3.9
90I	3.8±3.6	-7.8	5.5
90M	3.5±3.4	-6.9	1.2

60I	Blue	60-minute isometric
90I	Red	90-minute isometric
90M	Orange	90-minute movement

Biography

Siva Nalabothu has his expertise in computational neuroscience, neurology, coding, and molecular neuroscience. Ishaar Ganesan has his expertise in computational neuroscience, coding, and data analysis. With their group, they developed a new Myoelectric Computer Interface on the basis of the previous, flagship study on the MCI. After more than a year of experience in this field and working on this project, the final product is nearing completion. The foundation for this project is based on the paradigm initially designed by Tomic et al. that effectively utilized a game controlled by the MCI to reduce abnormal co-activation of muscles in stroke survivors. This foundation has allowed creating a device that can play a pivotal role in bringing severe stroke patients around the world an easier, more efficient method of rehabilitation.

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