

A Case Study to Assess the Effects of an Electrical Stimulation Suit on the Functional Mobility of an Individual with Secondary Progressive MS

Joe Green (Specialist Physiotherapist, Hobbs Rehabilitation, BSc, MCSP)

Background: Sensory level electrical stimulation is widely employed in TENS devices to control pain. Research has also established that this treatment can modulate central nervous activity to reduce spasticity (Mills and Dossa 2016). Employing 29 pairs of electrodes the Mollii suit has the ability to deliver sensory stimulation across the whole body. As a home treatment or as preparation for physiotherapy in a clinic the intervention has the potential to improve global postural activity and motor function



How it works: Mollii is a functional garment that consists of a pair of trousers, a jacket and a detachable control unit which sends electrical signals to the user via electrodes on the inside of the garment. Following assessment of posture and movement by a clinical specialist, a stimulation prescription is drawn up. A computer programme is used to control which electrodes are to be activated and the intensity of stimulation at each pair. The settings are then saved in the



Mollii control unit, making it simple for the device to be used at home. The modulating effects on the nervous system are thought to occur through the activation of sensory afferents which enter and are processed in spinal cord and higher centre neural circuitry.

Objectives: To explore the potential effects of 1 hour Mollii treatments on mobility, upper limb function and effort. To identify if any benefits that occur may be cumulative following alternate day intervention over a week

Outcome Measures (OM's)
 Timed Up and Go (TUG)
 10M walk test
 Modified Box and Blocks
 Numeric Rating Scale for Effort

Stimulation Parameters
 Pulse width: 25-175 us
 Frequency: 20 Hz
 Pulse shape: Square wave
 Electrodes: 58 Silicone rubber

Method: The Mollii suit was initially programmed and subsequently worn for 1 hour on 2 separate occasions. Outcome measures were recorded immediately before and after each treatment. Following this the assessment protocol was repeated a week later, after alternate day, hour long treatments with the suit.

Discussion: 1 hour Mollii treatments consistently led to immediate improvements in the efficiency and effectiveness of mobility and upper limb function. Diary records indicate that these benefits carried over into the following day, during the week when alternate day interventions were performed. 3 out of 4 baseline scores were improved and the treatment effect was greater in 3 out of four OM's after a week of alternate day use, which may indicate a training effect. MS is a condition in which motor performance can change quickly over short periods due to environmental and internal factors and the results of this single Case Study design need to be approached cautiously.

Results:

One off Tests	Before	After	% change
TUG time in seconds	57.8	51.0	12
10M walk in seconds	65.2	57.5	12
Modified Box and Blocks	5 blocks	7 blocks	40
NRC Effort Walking	9.25/10	6.5/10	30
Following 7 days of use	Before	After	% change
TUG time in seconds	48.62	43	12
10M walk in seconds	59.84	49.06	18
Modified Box and Blocks	5 blocks	12 blocks	140
NRC Effort Walking	8/10	5/10	38

“The Mollii suit lessens the battle between my left and right side, resulting in less energy needed for mobility.”
L.B. Sept 2016

Conclusion: The positive results of this single Case Study suggest that further investigation is indicated to explore the nature, duration and significance of the effects of this new treatment, in the MS population.