



SWORTEC

MotionMaker™ Performance & Benefits

MotionMaker™ is designed to evaluate and train muscle strength and endurance. In this way it prepares patients for gait and walk activities. [7]*

Therapeutic / Clinical

- Increase of functional control
- Increase of electrically induced force
- Improvement of blood circulation
- Muscle reinforcement
- Increase of voluntary force
- Increase of limb perception
- Long lasting decrease of hypertonia and spasticity
- Total physical and psychical relaxation after the training
- 6 articulations of both legs are trained at the same time and intensity during the whole training session
- Imperative type of training to build muscular mass and strength for walk preparation



Scientific research

- Easy to use for diagnostics and research
- Easy-to-use, precise and multi-level data for scientific research or therapist
- Exercises can be easily adapted to the research purpose
- Can be used for a vast range of patient profiles: spinal cord injury, stroke, cerebral palsy, traumatic brain injury, multiple sclerosis, locomotor's infirm



Economical

- Faster results than during conventional training
- Easy and convenient patient transfer
- Two therapies (mobilisation & electro stimulation) in one
- More efficiency (more muscles and articulations trained)
- One therapist for two patients
- Operating and patient comfort facility
- Does not require a special room, can be placed anywhere in the facilities, is easy to transport



Results in clinical use

- All tested patients increased their voluntary and electro-induced strength by an average 240-400% [*9; *6]
- Mobilisation exercises, realised with robotic rehabilitation device including electrical stimulation can stimulate the sensory-motor system. This can be the result of peripheral mechanisms and of central action of the nervous system – improved function of the spinal motor system, related to neural plasticity. [*6]
- Patient subjective impressions: patients found an increased awareness of their muscles and felt more confident in their functional activities, such as bed mobility, transfers and gait. [*6]





"The results provide elements for an objective and quantitative evaluation of the performances of the MotionMaker™, which ensure a reliable contribution to the diagnosis, assessment and recovery of functions during the rehabilitation process." [*5]

Articles:

1. P. Metrailler and others, **"Cyberthosis™: Rehabilitation Robotics With Controlled Electrical Muscle Stimulation"**; **Article in Rehabilitations Robotics**, Book edited by Sashi S Kommu, Ch. 17, 303-318, 2007
2. P. Metrailler, R. Frischknecht and others, **"Improvement of rehabilitation possibilities with the MotionMaker™"**, Proceedings of Biorob 2006, Pisa, Italy, 2006
3. P. Metrailler, R. Brodard and others, **"Closed loop electrical muscle stimulation in spinal cord injured rehabilitation"**, 6th Mediterranean Forum on PMR, Portugal, 2006
4. C.Schmitt, P. Metrailler and others, **"A Study of a Knee Extension Controlled by a Closed Loop Functional Electrical Stimulation"**, 9th Annual Conference of the International FES Society, Sept. 2004
5. C. Schmitt, P. Metrailler and others, **"The MotionMaker™: a rehabilitation system combining an orthosis with Closed-Loop Electrical Muscle Stimulation"**, 8th International Workshop on FES, 2004

"The CLEMS™ technology is able to control complex FES induced leg movements in paraplegic patients and opens new perspectives for motor rehabilitation." [*3]

Scientific / clinical study:

6. I. Bersch Porada and others, **"The Importance of the Intensity and the Number of Sessions per Week of Functional Electrical Stimulation (FES) in Patients with Post Traumatic Spinal Cord Injury (SCI)"**: Swiss Paraplegic Center, International Congress, USA, P-40, 2011
7. F. Reynard and others, **"Robotic rehabilitation and recovery of motor performance in a spinal cord injured population"**, CRR Suva Care; ESMAC London, 17-19 September 2009
8. F. Reynard and others, **"Movement analysis with a new robotic device – the MotionMaker™: a case report"**, CRR Suva Care; ESMAC London, 17-19 September 2009
9. P. Metrailler, and others, **"Closed loop electrical muscle stimulation in spinal cord injured rehabilitation"**, 6th Mediterranean Forum on PMR, Portugal, 2006

"The MotionMaker™ is able to identify and manage the occurrence of spasms. Fatigue can also be detected and over-fatigue during exercise prevented." [*2]

User references:

10. Swiss Paraplegic Center, Nottwil
11. Clinique Romande de Réadaptation (CRR), Sion
12. La Castalie, Monthey

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