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IMPROVEMENT OF TRUNK STABILITY IN CHRONIC PARAPLEGIC PATIENTS AFTER LONG-TERM TRAINING WITH ROBOTIC ORTHOTIC TRAINERS

Objectives: Trunk stability is essential for the execution of daily activities such as turning sideways from supine lying, rolling, the supine to/from sitting transition, clothing, transfers, standing position or walking. We analyzed the functional performance of the trunk in patients with chronic spinal cord injury (SCI, 6 ASIA A and 1 ASIA B) throughout a long-term training (12 months) involving orthostatic and gait training using the body weight support (BWS) system (Lokomat and ZeroG) and custom-built exoskeleton.

Methods: We used the clinical measurement known as Thoracic-Lumbar Control Scale and associated with a high speed tracking system and a surface EMG (electromyography) recording to quantitatively evaluate the motor performance of the

thoracolumbar spine. The test was run three times over the year with 7 chronic Spinal Cord Injury (SCI) paraplegic patients.

Results: We observed significant improvement in static and dynamic balance of the thoracic-lumbar spine in sitting and lying positions in five out of seven patients. The patients with the lowest lesions were the ones with the highest score at the end of the training (40 and 42 out of a maximum score of 65 for the patients with lesion at T10). Interestingly the biggest improvement was observed with the patient with the highest lesion (T4).

Conclusions: These findings reveal the importance of the physical rehabilitation training in orthostatic and walking devices even with chronic complete SCI patients. Patients with lesions as high as T4 showed significant improvement with our training.