

Repetitions in Physical and Occupational Therapy during Spinal Cord Injury Rehabilitation

Dominik Zbogor^{1,2}, Janice J Eng^{1,2}, William C Miller^{2,3}, Andrei V Krassioukov², Molly C Verrier⁴

¹Department of Physical Therapy, Faculty of Medicine, University of British Columbia, Vancouver Canada

²International Collaboration on Repair Discoveries, Vancouver Canada

³Department of Occupational Science & Occupational Therapy, Faculty of Medicine, University of British Columbia, Vancouver Canada

⁴Toronto Rehabilitation Institute-University Health Network, Toronto Canada; Department of Physical Therapy, Faculty of Medicine, University of Toronto, Toronto Canada

Objective: To quantify the amount of lower extremity and upper extremity movement repetitions that occur during inpatient SCI rehabilitation, and examine how repetitions change from admission to discharge.

Design: Longitudinal observational study.

Setting: Two Canadian inpatient SCI rehabilitation centres.

Participants: The 105 patients in this investigation were 49 ± 17 years old. Average time in rehabilitation was 96 ± 46 days. Fifty-five patients had paraplegia and 50 tetraplegia. Forty-seven were ambulatory at discharge.

Interventions: Two days of therapy were observed and averaged for admission and discharge. Observers recorded the time and repetitions for all activities. For analyses, we split patients into those with paraplegia or tetraplegia, and a subgroup of those able to ambulate at discharge. T-tests (admission vs. discharge) were used for therapy time and upper and lower extremity repetitions.

Main Outcome Measure: Repetitions of upper and lower extremity movements and change from admission to discharge.

Results: Therapeutic time composed between 56-67% of total therapy time. The highest repetitions for upper extremity movements were seen with patients with tetraplegia in OT (111.9 ± 170.2) and there was a significant decrease by discharge (56.1 ± 127.9 , $p=0.003$). The highest value for hand repetitions was also seen in OT (67.9 ± 122.4). The highest repetition values for the lower extremity (291.7 ± 303.8) and steps (128.3 ± 188.2) were seen in PT with ambulatory patients.

Conclusion: It appears that repetitions of upper extremity and lower extremity movement fall far below what the motor learning literature shows may be optimal to drive the neural reorganization needed to promote optimal function after SCI.