INTRODUCTION: Cervical injury causes tetraplegia in about half of spinal cord injury (SCI) cases and results in impaired hand function [1, 2]. Despite their different etiologies, both SCI and stroke subjects have demonstrated recovery by similar mechanisms of cortical reorganization [3]. This suggests that interventions used after stroke may also be effective after SCI [1]. With the current technology available, robotic devices are being used to provide safe and intensive rehabilitation to people with motor impairment after stroke [4-12]. The main objective of this study is to assess the safety, comfort, ease of use, fit and therapeutic value of robotic therapy in a SCI clinic. This study investigates the hypothesis that a robotic device used to deliver elbow flexion and extension exercises will be accepted by the subject and lead to improved strength in the treated limb of SCI subjects.

METHODS: Five subjects with incomplete SCI levels C5, C6 or C7 were recruited for Part 1 of this study to investigate acceptability of a rehabilitation device designed by Muscle Tech Ltd.[13]. Each subject underwent clinical and robotic evaluation to record their elbow range of motion in order to set the range for three robotic exercises. At the completion of the exercises, subjects were administered a questionnaire asking to rate safety, comfort, ease of use, fit and therapeutic value of the robotic therapy.

RESULTS: Safety, comfort, fit and therapeutic value ranked high on the questionnaire (>8/10). Ease of use for donning, doffing and using the device were ranked lowest because subjects recognized that designed changes and assistance are needed in order to use the device independently or in a rehabilitation facility.

CONCLUSIONS: Subjects reported that the robotic therapy is safe, comfortable, fit the arm well and that it provides challenging exercises. Design changes are needed however to address the devices limitations related to ease of donning, doffing and using the device.

References:
