A close up of MSKTC logo



# Quick Review of Model System Research

### Experience of Robotic Exoskeleton Use at Four Spinal Cord Injury Model Systems Centers1

### What is the study about?

This study describes clinicians’ experiences using robotic exoskeletons in spinal cord injury (SCI) rehabilitation. These experiences include their perceptions on the benefits and risks of using robotic exoskeletons, training strategies, and developments that can enhance clinical utility.

### What did the study find?

The four SCI model system centers revealed similar practice patterns regarding how they incorporate robotic exoskeletons into physical therapy services. Each of the centers abide by the Food and Drug Administration’s guidance on device use, though there are differences in how these centers deploy and evaluate exoskeletons. Physical therapists with a special certification primarily deliver robotic exoskeleton therapy. However, many centers employ exercise specialists in addition to physical therapists. The clinicians in these focus groups also noted that the social benefits of exoskeletons range from making eye contact while standing to improved bladder function; that exoskeleton technology is evolving rapidly, limiting their adoption of devices that will soon be obsolete; and that patient awareness of the fast-technological advancement was a factor in device purchasing. This study provides new insight into the consideration’s clinicians use in delivering robotic exoskeleton therapy as well as insights into users’ perspectives.

### Who participated in the study?

Thirty clinicians participated in focus groups that were comprised mostly of physical therapists with experience using robotic exoskeletons. The 30 participants were from 4 SCI model system centers including the Shirley Ryan AbilityLab, Craig Hospital, Shepherd Center, and TIRR Memorial Hermann.

### How was the study conducted?

This study used qualitative methods in the form of focus groups to address three primary questions: 1) What are the experiences, clinical evaluations, and training strategies using robotic exoskeletons in rehabilitation and wellness settings? 2) What benefits and risks of exoskeletons do clinicians perceive? 3) What limitations of exoskeletons do clinicians identify, and what changes do they suggest for hardware and software development?

### How can people use the results?

People with SCI can use the study’s results to inform decisions regarding robotic exoskeletons and rehabilitation. Clinicians considering whether to use robotic exoskeletons in SCI rehabilitation can use the results to help assess device benefits and risks. Managers who consider these equipment for their setups can use this information to make purchasing decisions

1 Heinemann, A. W., Jayaraman, A., Mummidisetty, C. K., Spraggins, J., Pinto, D., Charlifue, S., . . . Field-Fote, E. C. (2018). Experience of Robotic Exoskeleton Use at Four Spinal Cord Injury Model Systems Centers. Journal of Neurologic Physical Therapy, 42(4), 256-267. doi:10.1097/npt.0000000000000235. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30199518>

The contents of this quick review were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90DP0082). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this quick review do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.