



Rehabilitation robotics – closing the gap between expectation and current clinical performance

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Abstract

We have been using robotic devices for rehabilitation of neurological disorders, including spinal cord injury and stroke, for almost 20 years. The initial clinical results were encouraging, but these early results were not sustained, and later more extended trials have produced rather modest results. This presentation will review some of these studies, and explore reasons why the results were not as strong as was hoped. Suggestions for future approaches to overcome barriers to improvement will be explored.

Recommended references with the talk

1. Lo AC, Guarino PD, Richards LG, Haselkorn JK, Wittenberg GF, Federman DG, Ringer RJ, Wagner TH, Krebs HI, Volpe BT, Bever CT Jr, Bravata DM, Duncan PW, Corn BH, Maffucci AD, Nadeau SE, Conroy SS, Powell JM, Huang GD, Peduzzi P. “Robot-assisted therapy for long-term upper-limb impairment after stroke,” *N Engl J Med*. 2010 May 13;362(19):1772-83. PMID: 20400552
2. Duncan PW, Sullivan KJ, Behrman AL, Azen SP, Wu SS, Nadeau SE, Dobkin BH, Rose DK, Tilson JK, Cen S, Hayden SK; LEAPS Investigative Team. “Body-weight-supported treadmill rehabilitation after stroke,” *N Engl J Med*. 2011 May 26;364(21):2026-36. PMID: 21612471
3. Housman SJ, Scott KM, Reinkensmeyer, DJ. “A randomized controlled trial of gravity-supported, computer-enhanced arm exercise for individuals with severe hemiparesis,” *Neurorehabil Neural Repair*, 2009 June;23(5):505-14. PMID: 19237734