

Studies: Virtual reality and interactive biofeedback

Medical progress allows the use of new technologies like biofeedback and virtual reality (VR). Studies proof that e. g. patients after stroke profit from these approaches.

- Cho, K. H., Lee, K. J., & Song, C. H. (2012). Virtual-reality balance training with a video-game system improves dynamic balance in chronic stroke patients. *The Tohoku journal of experimental medicine*, 228(1), 69–74.
- Laver, K. E., George, S., Thomas, S., Deutsch, J. E., & Crotty, M. (2011). Virtual reality for stroke rehabilitation. *Cochrane database of systematic reviews (Online)*, (9), CD008349.
- Kim, J. H., Jang, S. H., Kim, C. S., Jung, J. H., & You, J. H. (2009). Use of virtual reality to enhance balance and ambulation in chronic stroke: a double-blind, randomized controlled study. *American journal of physical medicine & rehabilitation / Association of Academic Physiatrists*, 88(9), 693– 701.

Patients profit from visual feedback on weight distribution- and weight shifting activities.

- Zijlstra, A., Mancini, M., Chiari, L., & Zijlstra, W. (2010). Biofeedback for training balance and mobility tasks in older populations: a systematic review. *Journal of NeuroEngineering and Rehabilitation*, 7(1).
- van Vliet, P. M., & Wulf, G. (2006). Extrinsic feedback for motor learning after stroke: what is the evidence? *Disability and rehabilitation*, 28(13-14), 831–840.

Training with virtual reality and biofeedback improves function of the lower extremities, walking as well as cognition, perception and functional tasks (ADL).

- Deutsch, J. E. (2011). Using virtual reality to improve walking post-stroke: translation to individuals with diabetes. *Journal of diabetes science and technology*, 5(2), 309–314.
- Rose, F. D., Brooks, B. M., & Rizzo, A. A. (2005). Virtual reality in brain damage rehabilitation: review. *Cyberpsychology & behavior : the impact of the Internet, multimedia and virtual reality on behavior and society*, 8(3), 241-262.
- Sackley, Lincoln; (1997); Single blind randomized controlled trial of visual feedback after stroke: effects on stance symmetry and function.

Using modern computer technology can help to measure the efficiency by evaluation of the motion data more exact than conventional methods.

- Rizzo, AA, Buckwalter JG, McGee JS et al. (2001). Virtual environment for assessing and rehabilitating cognitive/ functional performance, a review of projects at the ISC integrated media system centre. *Presence*; 10: 359-374.
- Weiss PL, Naveh Y, Katz N (2003). Design and testing of a virtual environment tot rain stroke patients whith unilateral spatial neglect to cross a street savely. *Occupational Therapy International*; 10: 39-56.

Higher training success to be achieved by evaluation, visualisation and documentation of the training data.

- M. Guadagnoli, T. Lee; (2004); Challenge Point: A Framework for Conceptualizing the Effects of Various Practice Conditions in Motor Learning.