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## Retrain Your Brain: A Systematic Review of Functional Electrical Stimulation's Effect on ADL Participation Post-Stroke

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## **Call for Papers OT670**

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**Title:** Retrain Your Brain: A Systematic Review of Functional Electrical Stimulation's Effect on ADL Participation Post-Stroke

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**Primary Focus:** Rehab, Disability & Participation

### **Learning Objectives:**

- Describe the impact of stroke on ADL performance
- Identify the role of OT in stroke rehabilitation
- Explain how Functional Electrical Stimulation (FES) falls within the scope of OT practice
- Interpret the current evidence on how FES influences ADL participation for individuals post-stroke

### **Abstract:**

Stroke is one of the leading causes of long term disability in the United States (Centers for Disease Control and Prevention, 2015). According to Hartman-Maeir, Soroker, Ring, Avni, and Katz (2007), 57% of stroke survivors will eventually discontinue their meaningful activities, including activities of daily living (ADLs). Lack of independence in ADLs has a negative psychosocial impact (Kitson, Dow, Calabrese, Locock, & Athlin, 2012), contributes to decreased quality of life, and increased caregiver burden (Rigby, Gubitz, & Phillips, 2009). In this presentation, practitioners will be exposed to the current literature that examines the efficacy of Functional Electrical Stimulation (FES) as an intervention within the scope of occupational therapy practice to improve participation in ADLs in adults with stroke. A systematic review of the literature was conducted by searching PubMed, CINAHL, and Scopus databases. After abstract screening and full-text re-screening, 13 articles met the inclusion criteria: participants were adults with stroke, the intervention involved electrical stimulation concurrent with a functional task, and ADL performance as an outcome measure. Articles were critically appraised using the Law McDermid Quantitative Review Form and examined for level of evidence. After critical appraisal, 3 themes were evident: FES + additional therapy, location of FES intervention, and frequency of FES intervention. While control groups that received standard therapy demonstrated improvements in ADL performance, treatment groups receiving FES in addition to standard therapy had significantly better ADL performance than control groups (You et al.,

2014, Tanovic, 2009, & Tan et al., 2014). Treatments that took place within a clinic demonstrated significantly improved ADL performance (Kowalczewski et al., 2007; Tan et al., 2014; Tanovic, 2009; & You et al., 2014) while home-based treatments did not. Lastly, the only studies that demonstrated a statistically significant improvement in ADL performance consisted of FES conducted 5 or more days a week (Kowalczewski et al., 2007; Tan et al., 2014; Tanovic, 2009; & You et al., 2014). In this session, practitioners will learn how FES can be used in stroke rehabilitation and will apply this insight to guide best practice for clients who have sustained a stroke. Practitioners will understand how setting, frequency and additional therapy influence efficacy of FES for improving ADL participation.

**Level of material being presented:** Introductory

**Target Audience:** OT, OTA, OTS, Researcher

### References

- Centers for Disease Control and Prevention. (2015). Stroke Facts. Retrieved from <http://www.cdc.gov/stroke/facts.htm>
- Hartman-Maeir, A., Soroker, N., Ring, H., Avni, N., & Katz, N. (2007). Activities, participation and satisfaction one-year post stroke. *Disability and Rehabilitation*, 29, 559–566. <http://dx.doi.org/10.1080/09638280600924996>
- Kitson, A. L., Dow, C., Calabrese, J. D., Locock, L., & Athlin, Å. M. (2013). Stroke survivors' experiences of the fundamentals of care: A qualitative analysis. *International journal of nursing studies*, 50(3), 392-403[Ma1] .
- Kowalczewski, J., Gritsenko, V., Ashworth, N., Ellaway, P., & Prochazka, A. (2007). Upper-extremity functional electric stimulation–assisted exercises on a workstation in the subacute phase of stroke recovery. *Archives of physical medicine and rehabilitation*, 88(7), 833-839.
- Rigby, H., Gubitz, G., & Phillips, S. (2009). A systematic review of caregiver burden following stroke. *International Journal of Stroke*, 4(4), 285-292. doi: 10.1111/j.1747-4949.2009.00289.x
- Quandt, F., & Hummel, F. C. (2014). The influence of functional electrical stimulation on hand motor recovery in stroke patients: a review. *Experimental & translational stroke medicine*, 6(1),
- Tan, Z., Liu, H., Yan, T., Jin, D., He, X., Zheng, X., et al. (2014). The effectiveness of functional electrical stimulation based on a normal gait pattern on subjects with early stroke: A randomized controlled trial. *BioMed Research International*, 2014 doi:10.1155/2014/545408

Tanovic, E. (2009). Effects of functional electrical stimulation in rehabilitation with hemiparesis patients. *Bosnian Journal of Basic Medical Sciences / Udruzenje Basicnih Mediciniskih Znanosti = Association of Basic Medical Sciences*, 9(1), 49-53.

You, G., Liang, H., & Yan, T. (2014). Functional electrical stimulation early after stroke improves lower limb motor function and ability in activities of daily living. *Neurorehabilitation*, 35(3), 381-389. doi:10.3233/NRE-141129 [doi]