



## FES CYCLING AND STROKE/HEMIPARESIS SHEET

### WHAT IS FES CYCLING?

Functional Electrical Stimulation (FES) Cycling is a therapeutic exercise where small electrical pulses are applied to peripheral nerves through adhesive electrodes in order to produce strong muscle contractions in weakened or paralyzed muscles. These muscle contractions are then utilized to facilitate cycling exercise with a motor, providing assistance and/or resistance to pedaling.

### HOW CAN FES CYCLING HELP ME?

Below are some summaries of studies from the four decades' worth of clinical research on lower extremity FES Cycling in individuals after stroke– highlighting the potential benefits. We

start with a systematic review (comprehensive review and evaluation of the research on a certain topic) followed by additional individual studies.

Published	Article Topic/Summary	What does this mean?
2024 <sup>1</sup>	Systematic Review: FES cycling can improve motor function and activity in post-stroke (early subacute phase)	<ul style="list-style-type: none"> <li>The addition of FES cycling to a standard exercise program may further <b>enhance trunk control and walking distance</b></li> </ul>
2011 <sup>2</sup>	FES Cycling improves motor recovery in patients with one-sided weakness soon after stroke	<ul style="list-style-type: none"> <li>Improvements found in <b>leg and trunk strength, trunk control and motor control</b></li> <li>Found that the use of FES cycling promotes <b>faster recovery for walking</b></li> <li>Unable to determine what effect voluntary effort + FES might have on outcomes</li> </ul>
2021 <sup>3</sup>	How effective is FES Cycling on improving function of lower limbs in patients after stroke?	<ul style="list-style-type: none"> <li>After intervals of 4 and 8 weeks, those in the FES group showed statistically significant <b>improvements on assessments of motor function, sensation, balance, range of motion, pain, transfers, activities of daily living and mobility compared to controls</b></li> </ul>
2013 <sup>4</sup>	The effects of FES Cycling on exercise capacity and functional ability in subacute stroke patients	<ul style="list-style-type: none"> <li>After 4 weeks, FES group showed <b>significant improvements in walking endurance, balance, transfers, mobility and exercise capacity</b></li> <li>Results indicate FES cycling may help with coordinated muscle activity and <b>relearning how to execute movements</b> of weakened muscles voluntarily</li> </ul>

## REFERENCES:

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3. Zhang XH;Liu JY;Han P;Wang YL;Xiao P; (n.d.-a). Clinical efficacy of functional electrical stimulation-assisted rehabilitation cycling on the function of lower limbs in patients with stroke. *Current neurovascular research*. <https://pubmed.ncbi.nlm.nih.gov/34636309/>
4. Lee, S. Y., Kang, S.-Y., Im, S. H., Kim, B. R., Kim, S. M., Yoon, H. M., & Han, E. Y. (2013, October). The effects of assisted ergometer training with a functional electrical stimulation on exercise capacity and functional ability in subacute stroke patients. *Annals of rehabilitation medicine*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3825937/>