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## Strength Training to Improve Gait in People with Multiple Sclerosis

Mark M. Mañago, Stephanie Glick, Jeffrey R. Hebert, Susan Coote, and Margaret Schenkman (2019). *International Journal of MS Care*: Vol. 21, No. 2, pp. 47-56.

### Setting the scene:

This critical review was conducted to explore dosage, frequency, mode, position, and muscle targets of studies that have included strength training in people with MS.

### What did they do?

Randomized controlled trials involving people with MS were included that implemented strength training with or without other interventions and assessed 1) strength in the lower extremities and/or trunk and 2) gait speed and/or endurance. Strength and gait results were extracted, along with exercise frequency, intensity, duration, mode, position, and muscle targets. Thirteen trials met the inclusion criteria; nine used dosing consistent with recommended guidelines. Overall, six studies reported significant between-group strength improvements, and four reported within-group changes. Four studies reported significant between-group gait improvements for gait speed and/or endurance, and two reported within-group changes. Most exercises were performed on exercise machines while sitting, supine, or prone. The most common intervention target was knee extension.

### Takeaway message:

- In studies that implemented strength training and measured gait outcomes, this review found a trend toward major improvement in strength outcomes but not in gait performance as measured by speed and endurance.
- This review found that studies including strength training for people with MS, either alone or combined with other rehabilitation interventions, are typically prescribed in a manner consistent with current guidelines and can improve strength. However, to improve gait, future studies might consider exploring higher intensities or frequencies.
- This review found that strength training exercises most often focused on the knee and were performed on weight machines in a sitting position.

This may be a reason strength training has not resulted in consistent improvements in gait, and future studies are needed that investigate muscle targets, positions, and modes of exercise that are functionally relevant to gait.