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<sup>1</sup> Finley, M.A., Rodgers, M.M. "Effect of 2-Speed Geared Manual Wheelchair Propulsion on Shoulder Pain and Function." Archives of Physical Medicine and Rehabilitation. Vol. 88, December 2007, pgs 1622-1627.

# Effect of 2-Speed Geared Manual Wheelchair Propulsion on Shoulder Pain and Function

Archives of Physical Medicine and Rehabilitation, Vol. 88, December 2007: pages 1622-7.

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## Abstract

**Objective:** To investigate the impact of a manual 2-gear drive wheelchair wheel (*MAGICWHEELS*<sup>®</sup>) on shoulder pain and function in manual wheelchair users.

**Design:** A single-group, repeated-measures pre- and post-design with baseline and retention.

**Setting:** General community.

**Participants:** Full-time manual wheelchair users (N=17) currently experiencing shoulder pain (mean age, 46±14y; wheelchair use, 15±10y).

**Intervention:** Five-month trial using a 2-gear wheelchair wheel.

**Main Outcomes Measures:** The Wheelchair Users Shoulder Pain Index (WUSPI).

**Results:** There was significant reduction in shoulder pain after the intervention at week 2 (P=.004) through week 16 (P=.015).

## Discussions:

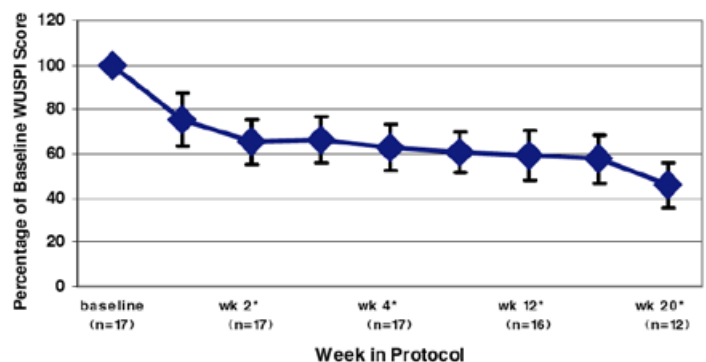
- Weight: "before the study we considered the possibility that the added weight (~10lbs) of the *MAGICWHEELS*<sup>®</sup> would lead to an increase in shoulder pain. The concerns proved **unfounded** as the individual item analysis on the WUSPI revealed that there was no increase in pain on the weight dependent item, 'loading the wheelchair into car,' as reported by the 9 participants who regularly performed this task, and overall shoulder pain was reduced significantly."
- "In exit surveys with our participants, all reported that they were able to propel on surfaces and terrains that they had previously avoided or surfaces on which they had found difficulty maneuvering."
- "An intervention that can reduce shoulder pain and potentially promote increased mobility and independence is of utmost importance to manual wheelchair users. The *MAGICWHEELS*<sup>®</sup> 2-gear wheelchair wheels have been shown to reduce shoulder pain with short-time use (2-wk); it has the potential to result in a progressive reduction in pain with its use over a longer time."

## Conclusions:

There were pain reductions 2 weeks after using the *MAGICWHEELS*<sup>®</sup> indicating a rapid response to the intervention. These findings indicate the potential for shoulder pain reduction with the use of a manual drive wheel during mobility, **even in highly functional manual wheelchair users.**

## Wheelchair Users Shoulder Pain Index (WUSPI) measured

- Transfer from bed to wheelchair
- Transfer from wheelchair to car
- Transfer from wheelchair to tub or shower
- Loading the wheelchair into a car
- Pushing the wheelchair for 10 minutes or more
- Pushing up ramps or outdoor inclines
- Lifting objects to remove them from overhead shelf
- Putting on pants
- Putting on a T-shirt or pullover
- Putting on a button down shirt
- Washing one's back
- Usual daily activities at work or school
- Driving
- Performing household chores
- Sleeping



\* = significant change from baseline

WUSPI surveys: Baseline phase = 5,

Intervention phase = 8, Retention phase = 4

**WUSPI items showing significant reduction: Ten minute push, ramp ascent, driving, chores, sleeping**

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Key Words: [Rehabilitation](#), [Shoulder pain](#), [Wheelchairs](#)

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Supported by the National Institutes of Health (grant no. SBIR 5 R44 HD035793-05).

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