

# ADVANCE FOR PHYSICAL THERAPY & REHAB MEDICINE

## GERIATRIC FUNCTION

By Carole Lewis, DPT, GCS, GTC, MSG, MPA, PhD, FAPTA, and Keiba Shaw, EdD, MPT, MA

### Clinical Prediction Rules, Treatment Strategies for CTS

We have heard patients say “You can’t imagine how annoying it is to have this pain, tingling and numbness. Is there anything I can do for this short of surgery?” The answer is yes. The 2000s have heralded the development of Clinical Prediction Rules. A clinical prediction rule is type of medical research study in which researchers try to identify the best combination of medical sign, symptoms and other findings in predicting the probability of a specific disease or outcome.<sup>1</sup>

Carpal tunnel syndrome (CTS) is one area of rehabilitation where a clinical prediction rule has been developed and despite all the tests we learned in school, the ones that were most predictive are listed below:

- Shaking the hands gives symptom relief;
- Wrist-Ratio Index greater than .67;
- Symptom Severity Scale score  $\geq 1.9$ ;
- Reduced median sensory of digit 1- $\geq 45$  y/o.

The Wrist-Ratio Index indicates carpal canal volume. To calculate the wrist ratio index, use calipers to measure anterior /posterior (AP) and mediolateral (ML) diameters of the wrist in centimeters. Then use the formula: Divide AP/ML widths.<sup>2</sup>

### Evidence on Treatment

Once the diagnosis is accurately determined, there are some useful treatment strategies that are evidence-based. Piazzini et al found strong evidence for local and oral steroids.<sup>3</sup> They found moderate evidence for splints and moderate evidence for the ineffectiveness of Vitamin B6. In addition, they found limited evidence for the effectiveness of NSAIDS, lasers, yoga, ultrasound and diuretics. They also found limited and conflicting evidence for the efficacy of Botox and exercise in the treatment of carpal tunnel.

The two ultrasound studies that did show some evidence were published in the late 1990s. One by Oztas showed that both the placebo and the ultrasound provided relief.<sup>4</sup> Ebenbichler showed that ultrasound (1.0 w/cm<sup>2</sup> pulsed for 15 minutes) was superior to sham in treating mild to moderate CTS.<sup>5</sup>

### Effect of Exercise

Exploring some of the studies in the exercise arena brings us to the early work of Rosmaryn and nerve gliding exercises.<sup>6</sup> Rosmaryn’s simple exercises that were done throughout the day and especially when one was doing activities (e.g., typing) that might exacerbate symptoms showed significantly more patients in the control group had surgery than in the exercise group.

The development of Seradge’s exercise program began with in vivo measurement of carpal tunnel pressure back in 1995. He found that the following activities increased the pressure in the carpal tunnel: making a fist, holding objects, pushing, isolated finger work and sustained contraction of finger flexors.

He also found that brief intermittent hand exercises (30 cycles per 1 minute) decreased the pressure on the carpal tunnel.<sup>7</sup> This work led to a later article that found that when the experimental group did the exercises, the success rate was 67 percent compared to 18 to 34 percent reported nationally for conventional treatment of carpal tunnel syndrome.<sup>8</sup>

This exercise program is simple. When doing repetitive activities that may cause symptoms, try to do the following every hour:

- Extend and stretch both fingers and wrist as if they were in a handstand position. Hold for five seconds;
- Straighten both wrists and relax fingers;
- Make a tight fist with both hands;
- Bend both wrists down with the hands still in a fist. Hold for five seconds;
- Straighten both wrists and relax fingers for five seconds;
- Hang arms loosely at sides and shake them for five seconds;
- Repeat steps 1 through 6, 10 times.

There are several studies that looked at the efficacy of splinting. Bringer found that the groups wearing the splint had the best results.<sup>9</sup> The splint was fabricated with the wrist in neutral and stabilized MCP joints. Ceiker showed that both splinting combined with the use of NSAID and steroid injection into the carpal tunnel resulted in significant improvement.<sup>10</sup>

The evidence keeps evolving in this area. We must constantly keep our eyes open to what is out there for the best combination for assessing and treating this complex problem. To have support behind our belief that rehabilitation can help patients' CTS, clinicians must use evidence and continue research efforts.

## References

1. McGinn, T., Guyatt, G., et al. (2000). Users' guides to the medical literature: XXII: How to use articles about clinical decision rules. Evidence-based medicine working group. *Journal of the American Medical Association*, 284(1), 79-84.
2. Wainner, R., Fritz, J., et al. (2005). Development of a clinical prediction rule for the diagnosis of carpal tunnel syndrome. *Archives of Physical and Medical Rehabilitation*, 86.
3. Piazzini, D., Aprile, I., et al. (2007). A systematic review of conservative treatment of carpal tunnel syndrome. *Clinical Rehabilitation*, 21, 299.
4. Oztas, O., Turan, B., Bora, I., & Karakaya, M. (1998). Ultrasound therapy effect in carpal tunnel syndrome. *Archives of Physical and Medical Rehabilitation*, 79(12), 1540-1544.
5. Ebenbichler, G., Resch, K., et al. (1998). Ultrasound treatment for treating the carpal tunnel syndrome: Randomised "Sham" controlled trial. *British Medical Journal*, 316, 731-735.
6. Rozmaryn, L., Dovel, S., et al. (1998). Nerve and tendon gliding exercises and the conservative management of carpal tunnel syndrome. *Journal of Hand Therapy*, 11(3), 171-179.
7. Seradge, H., Jia, Y., & Owens, W. (1995). In vivo measurement of carpal tunnel pressure in the functioning hand. *The Journal of Hand Surgery*, 20A(5).
8. Seradge, H., Parker, W., Baer, C., Mayfield, K., & Schall, L. (2002). Conservative treatment of carpal tunnel syndrome: An outcome study of adjunct exercises. *Journal of the Oklahoma State Medical Association*, 95(1), 7-14.
9. Bringer, T., et al. (2007). Efficacy of a fabricated customized splint and tendon nerve gliding exercises for the treatment of carpal tunnel syndrome: A randomized controlled trial. *Archives of Physical and Medical Rehabilitation*, 88, 1429-1435.
10. Celiker, R., Arslan, S., & Inanici, F. (2002). Corticosteroid injection vs. nonsteroidal anti-inflammatory drug and splinting in carpal tunnel syndrome. *American Journal of Physical and Medical Rehabilitation*, 81, 182-186.

*Dr. Lewis is a consulting clinical specialist for Professional SportsCare and Rehab and co owner of The Center of Evidence. She lectures exclusively for GREAT Seminars and Books, Inc. Dr. Lewis is also the author of numerous textbooks. Her Website address is [www.greatseminarsandbooks.com](http://www.greatseminarsandbooks.com). Dr. Shaw is Associate Professor for the School of Physical Therapy at Rueckert-Hartman College for Health Professions, Regis University, Denver, CO.*