

THE EDMOND SUN



4/7/04

JAMES COBURN

The Edmond Sun

A strange numbness appeared in the middle finger and spread to the thumb. A semi-circle of piercing pain eventually caused the nerves in a patient's hand to feel as if they were on fire. Slowly, the pain of carpal tunnel syndrome had progressed to the woman's elbows during the course of a year.

People with carpal tunnel syndrome have compared their pain to being stabbed with small needles. Physicians usually give such patients a conventional wrist brace to keep their lower wrist and palm stationary before having surgery to try alleviating the problem. Surgery has been the long traditional and prevailing way to treat carpal tunnel syndrome.

Surgery the last option

However, surgery should be a last resort, explained Roger Williams, an occupational therapist specializing in hand rehabilitation. He is president and founder of Midwest City Therapy Inc., a multidisciplinary rehab agency focusing on occupational and physical therapy, sports injuries and industrial trauma.

Surgery should be a last resort, he added. The Centers of Disease Control and Prevention reports that after five years in follow up, 57 percent of patients surgically treated reported a return of some symptoms.

Williams' work inspires him to restore patients' sense of well being, he said. So he designed a co-dynamic orthotic device he named the Carpal Glove. The Carpal Glove is a soft splint that he developed through 10 years of research. Williams said the co-dynamic orthotic offers a better outcome than a conventional splint because the Carpal Glove's design therapeutically promotes wrist movement.

The splint encourages the hand to use all degrees of motion. Muscles are retrained with emphasis given to strengthening muscles that restore the hands to proper alignment.

"That was my goal all along," Williams explained. "To create something, someone could use that would not obstruct their motion, that would not obstruct the function of the hand in any way."

Selling the glove

Nothing in literature had reflected Williams' understanding of carpal tunnel. His innovation faced much skepticism. So during the past three years, Williams has made annual presentations to the Annual Symposia of the American Society for Peripheral Nerve.

"This was met with a great deal of enthusiasm," he said. "I think I made my point this year very well." In March, Williams explained his research to a group of therapists at a seminar at INTEGRIS Southwest Medical Center in Oklahoma City.

The new treatment approach relies on a gentle nudge by a spring-loaded splint to the palm of a hand in motion. The nudge helps the wrist balance back to its normal position. The counter-lever force of the carpal glove stabilizes the wrist during ordinary wrist movements but does not cause weakness or loss in range of motion so common in other methods of splinting. The more the hand is used in the device the sooner the symptoms of carpal tunnel are resolved, Williams said.

The Carpal Glove is a little more streamlined than the original orthotic device he created a few years ago. Therapists will find the glove easier to fit on their patients, he said.

The Edmond resident is the inventor of more than 40 devices used in the rehabilitation of the upper extremities. He also is an adjunct faculty member of Oklahoma City Community College and Southwestern Oklahoma State University Caddo Kiowa Career Tech Center, and is clinical instructor for the University of Oklahoma Occupational Therapy students. And Williams is a member of the American Society for Hand Therapists, American Society for Peripheral Nerve and American Occupational Therapy Association.

Understanding the problem

In order to understand the principals behind his innovative research, one must forget everything they thought they knew about carpal tunnel syndrome, he said.

A popular misconception is that carpal tunnel is repetitive induced. Yet there is no direct evidence to that fact, Williams said. The root cause of the syndrome is a series of unique events involving an imbalance of muscle tone, followed by an imbalance of ligament tone. Simple changes in the wrist often result in loss of hand function, he said. Movement causes the hand to be an object of misery with tingling and incessant numbness.

"Why does the nerve not have problems when you use your hand repetitively? It doesn't in everybody," he said.

"... But what comes first - the compression of the nerve or the problem? The problem comes first. And what my research points out is that the problem is the collapse of the architecture of the wrist."

Williams' understanding of the cause of carpal tunnel syndrome was broadened when considering the use of the pisiform, a wrist bone the size of a pea.

It is one of the carpal bones not thoroughly understood by scientists, he said, and is the only bone with a muscle attachment in the wrist.

It is considered a useless sesamoid bone in the current tradition of understanding. But Williams' research has proved otherwise.

He documented how the transmission forces of muscles that flex and extend fingers and thumb are moving the wrist and hand down causing the disorder.

A 2003 electromyography study conducted by Williams indicated that each carpal tunnel patient had two to six nerve compressions.

Their drop of wrist was determined to be consistent with nerve compression, causing carpal tunnel.

However, the counter-level force of the Carpal Glove stabilizes the wrist during ordinary movements.

Williams said the Carpal Glove offers a better outcome than a conventional splint because the design therapeutically relates to wrist movement.

"That was my goal all along," Williams explained, "to create something (that) someone could use that would not obstruct their motion that would not obstruct the function of the hand in any way."

A patient's grip will increase immediately by 10 to 20 percent when wearing the Carpal Glove, he continued.

His studies report that carpal tunnel symptoms are generally resolved in two days with the Carpal Glove's co-dynamic hand use.

(Features Editor James Coburn may be reached via e-mail at [jacoburn@edmondsun.com](mailto:jcoburn@edmondsun.com).)