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*Figure 1*

## Getting a Grip on Carpal Tunnel Syndrome

*By Michael G. Raab, MD*

When considering the reasons for lost productivity in the workplace, carpal tunnel syndrome (CTS) can be identified as one of the biggest culprits. Compared with other illnesses and injuries, CTS is one of the most common causes of work absences, Workers Compensation claims, and insurance claims.

The “carpal tunnel” is the cross sectional area of the wrist through which the median nerve and flexor tendons travel to the hand. The wrist bones form the back of the tunnel, and the transverse carpal ligament (TCL) forms the “roof” of the carpal tunnel. (See Figure 1, below left)

Carpal tunnel syndrome is a specific group of symptoms including tingling, numbness, weakness, or pain in the hand and occasionally in the forearm or elbow. These symptoms occur when there is pressure on the median nerve within the wrist. The fingers most often involved are the thumb, index and middle; and symptoms often are noticeable at night.

CTS generally occurs when the median nerve becomes inflamed or irritated – either by direct trauma, or from excessive pressure on the nerve due to swelling of the tendons that run in the carpal tunnel, or from a mass or growth inside the carpal tunnel. Swelling of the tendons can occur from overuse – either at work, at home, at recreation, or a combination of all three – or from underlying medical conditions such as diabetes, gout, or thyroid disorders.

Mild CTS symptoms primarily affect the hand and forearm, but can radiate to the shoulder. They include:

- Numbness or pain in the hand, forearm, or wrist that causes waking in the night (shaking or moving the fingers may ease this numbness and pain).
- Occasional tingling, numbness, “pins-and-needles” sensation, or pain similar to the hand falling asleep.
- Numbness or pain that worsens while using the hand or wrist, especially when gripping an object or flexing the wrist.
- Problems at work because of pain in the fingers or hand.
- Aching pain in the forearm between the elbow and wrist.

With moderate or severe CTS, the person may have numbness or reduced strength and grip in the fingers or hand. It may be difficult

for the individual to:

- Perform simple hand movements such as brushing hair or holding a fork. The person may accidentally drop objects.
- Pinch an object between the thumb and first finger.
- Use the thumb while doing simple tasks such as opening a jar or using a screwdriver. With long-lasting CTS, the thumb muscles can begin to atrophy.

Many cases of CTS can be prevented or alleviated by reducing or altering the activity that stresses the fingers, hand, or wrist, or by changing the way the activity is done. This is the first recommended course for anyone who suspects CTS. Along with resting the affected area, a four-week trial of night splinting is recommended.

If symptoms persist or return after four weeks of resting the hand and wrist, the person can consider seeing a board certified orthopedic surgeon for evaluation and further treatment. The earlier the condition is diagnosed, the better the chances of relieving the symptoms and preventing permanent damage to the median nerve.

Treatment for CTS is based on the seriousness of the condition, whether there is nerve damage, and whether other treatment has helped. Non-surgical treatment options, recommended for mild or early cases, may include:

- Changing or avoiding activities that may be causing the condition, and taking frequent breaks from repetitive tasks.
- Wearing a wrist splint.
- Applying ice packs.
- Using non-steroidal anti-inflammatory drugs (NSAIDS) to relieve pain and reduce inflammation.
- Doing exercises to stretch and strengthen the muscles of the hand and arm. Stretching the wrist and hand before work may help prepare the carpal tunnel for repetitive movements.
- Corticosteroid injections into the carpal tunnel.

Surgery may be recommended if other treatment has not helped, if the condition has continued for a long time, or if there is nerve damage or the risk of nerve damage. Generally, surgery is recommended if:

- Symptoms have not improved after a period of non-surgical treatment.
- Severe symptoms restrict normal daily activities, as when there is a persistent loss of feeling and coordination in the fingers and hand, or no strength in the thumb.

NOTE:
Dr. Raab has treated more than 2,000 cases of carpal tunnel, both surgically and non-surgically. He is an advocate of early return to work (with appropriate modifications and restrictions) and of educating patients in understandable terms about CTS. He is a board certified orthopedic surgeon, a member of the American Association for Hand Surgery (AAHS), a member of the Georgia Society for Surgery of the Hand (GSSH) and a Fellow of the American Academy of Orthopaedic Surgeons (AAOS).

- There is damage to the median nerve (shown by nerve test results), loss of hand or finger function, or a risk of damage to the nerve.

Carpal tunnel release surgery is performed to reduce the pressure on the median nerve in the wrist. This is done by cutting ("releasing") the transverse carpal ligament, which forms the roof of the carpal tunnel. Cutting this ligament relieves pressure on the median nerve. This is known as a carpal tunnel release (CTR). Any other tissue (such as a growth) that may be putting pressure on the median nerve can also be removed during surgery. The surgeon will recommend one of two approaches:

- **Open carpal tunnel surgery**, which allows the doctor to see more of the inner tissues, including the full width of the transverse carpal ligament where it is to be cut.
- **Endoscopic carpal tunnel surgery**, which requires only a small incision at the wrist (single-portal technique), or at the wrist and palm (two-portal technique).

While surgery is usually successful, in some cases it does not completely relieve the numbness and pain in the fingers and hand. This may be the case if there has been permanent nerve damage caused by longstanding CTS, or by underlying conditions such as diabetes or rheumatoid arthritis.

Risks of surgery include, but are not limited to: bleeding; infection; painful scar; chronic pain; RSD; nerve, tendon or artery problems; or incomplete or delayed resolution of symptoms. Though uncommon, the above complications may occur in a very small percentage of patients. This is why non-surgical treatment should be carried out before considering surgery.

Following surgery, the patient will need to wear a plaster splint for a week to ten days. During this time, the patient will be instructed to avoid use of the affected wrist and hand. Once the splint and stitches are removed, a wrist brace should be worn for several weeks, and light activity may resume. Generally speaking, the patient will be released to return to work one to two months following the surgery. The brace may be worn at night or during strenuous activities for as long as necessary.

After surgery, it is important to alter any activities that may have contributed to CTS. Retraining (learning new ways of doing things), and ergonomic considerations (having the body in the proper position and using equipment that is appropriate for the person's strength and ability) may help prevent CTS from coming back.

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NOTE:
If you have questions or comments concerning this article, or would like additional information about CTS, or other hand, arm or shoulder conditions, contact Dr. Raab at 770-532-7202.