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# CARPAL TUNNEL SYNDROME

Carpal Tunnel Syndrome (CTS) is a condition that causes annoying hand and arm symptoms like numbness and aching. The condition occurs most frequently in women, but may affect men or women at almost any stage of life. CTS becomes worse with excessive use of the wrist, as with continual movements encountered in some occupations or athletic activities. The carpal tunnel is a passageway in the wrist formed by eight carpal (wrist) bones, which make up the floor and sides of the tunnel, and the transverse carpal ligament, a strong ligament stretching across the roof of the tunnel.

Within the carpal tunnel are nine tendons which are each about the size of a pencil. These tendons join the muscles of the forearm to the fingers and thumb. As your forearm muscles contract, these tendons will move toward your elbow and will bend the fingers toward the palm. One other structure within the carpal tunnel is the median nerve, a cord also about the size of a pencil which contains thousands of nerve fibers supplying sensation (feeling) to your thumb, index and middle fingers, and half of the ring finger. In a healthy wrist, the tendons, median nerve, and transverse ligament work in harmony, but in the case where the carpal tunnel contents may be expanded, the patient can experience a sensation of "pins and needles," numbness and aching in the fingers, wrist and arm due to increased pressure on the median nerve.

## **Causes of Carpal Tunnel Syndrome**

Carpal Tunnel Syndrome can be caused by a variety of problems. Certain medical conditions that may lead to compression of the median nerve include:

- Inflammation or swelling about the tendons
- Fluid retention
- Wrist fractures and dislocations
- Crushing injuries
- Rheumatoid/degenerative arthritis
- Diabetes
- Enlargement of the median nerve
- Tumors
- Hypothyroidism
- Pregnancy
- Walking with a walker and carrying your weight on the palms of your hand

There is considerable debate as to whether specific occupations lead to CTS, although there seems little doubt that these activities aggravate and produce the related symptoms. Non-work related activities may also provide symptoms of CTS, including: lawn mowing; long-distance driving; knitting; wood carving—activities which involve prolonged or repetitive grasping and wrist flexion.

## **Symptoms of Carpal Tunnel Syndrome**

Numbness, burning, or tingling of one or more fingers (excluding the little finger) is the most common symptom of CTS. The pain and numbness can happen at any time, but often it occurs at night and may awaken the sufferer from sleep. At times, the pain may extend up the arm, into the elbow, and as far up as the shoulder and neck. Shaking, massaging or elevating the hands can sometimes gain partial relief.

On the palm side of the hand, just below the thumb, is a bulging pad of muscle called the thenar muscle group. These muscles are controlled by the median nerve. With CTS, this muscle group may begin to waste away, giving a flattened appearance to the palm when compared to the other hand.

## **Treatments of Carpal Tunnel Syndrome**

Many patients with CTS are treated without surgery. Conservative treatment of patients with mild symptoms usually involves rest of the hand and arm, and avoidance of activities that may aggravate the symptoms. Another conservative treatment would be the use of wrist splints particularly worn at

night. Next, Vitamin B-6, available over the counter in any drug store, has proven effective for some CTS sufferers. But this treatment may take several months of trial to determine its effectiveness. Anti-inflammatory medications may also be tried for CTS, but they may not prove helpful, particularly for patients with excessive symptoms. Another treatment, cortisone injections directly into the carpal tunnel, usually prove effective for at least short-term relief. If these conservative efforts prove ineffective, or if the symptoms are severe, surgical decompression of the carpal tunnel may be needed.

Surgery is usually performed on an outpatient basis. An incision is made on the palm of the hand, and the surgeon will cut (release) the ligament forming the roof of the tunnel. This relieves the pressure on the median nerve. It is also possible to release the ligament from inside the carpal tunnel using a technique called endoscopic carpal tunnel release. With the blood flow to the median nerve restored, the symptoms of burning and tingling are usually relieved soon after surgery. After surgery, the wrist and hand are wrapped in a bandage with the fingers and thumb free for full motion. Pain medication is provided and any excessive pain or swelling is promptly reported to the surgeon. Patients will be instructed to keep the hand elevated for the first few days. Frequent flexion and extension exercises of the fingers are extremely important to prevent stiffness and swelling. At ten 10-14 days after surgery, the bandages and stitches are removed, and wrist motion is added to the exercise routine. Over the next several weeks, gradual progress in motion, strength and hand and wrist use will occur.

Patients can expect soreness from the incision for 4-6 weeks and discomfort from deep pressure for as long as several months. Recovery also depends upon the amount of weakness the patient experiences before surgery and how the patient works on strengthening afterwards. Some studies indicate that it may take a year to recover full strength after carpal tunnel decompression.

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