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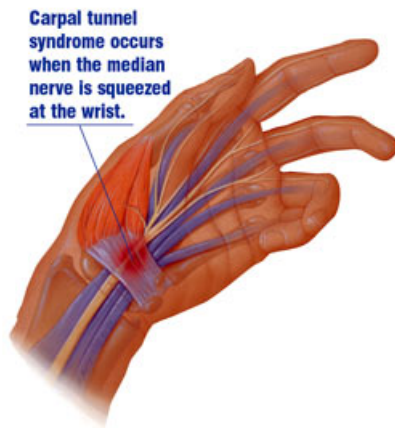
CARPAL TUNNEL SYNDROME

PATIENT INFORMATION

This resource, developed by neurosurgeons, provides patients and their families trustworthy information on neurosurgical conditions and treatments.

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Carpal Tunnel Syndrome (CTS) is a common problem affecting hand function, caused by compression of the median nerve at the wrist. It most often occurs when the median nerve in the wrist becomes inflamed after being aggravated by repetitive movements, such as typing on a computer keyboard, talking on the phone (holding phone to the ear), texting or playing the piano. It also affects professional artists (sculptors, printmakers, violinists) or any job requiring long-term repetitive motion of the wrist (jackhammer use, certain factory positions).



The carpal tunnel is formed by the bones, tendons and ligaments that surround the median nerve. Since the median nerve supplies sensation to the thumb, index, and middle finger and part of the ring finger (digits one through four), and provides motion to the muscles of the thumb and hand, CTS sufferers notice numbness, pain and weakness in these areas.

Common Symptoms

- Hand and wrist pain
- A burning sensation in the middle and index fingers
- Thumb and finger numbness
- An electric-like shock through the wrist and hand

These symptoms are often exaggerated when the wrist is bent forward. The numbness or pain may be worse at night, and may actually keep patients awake. During the day, it may occur more often when participating in activities that bend the wrist (talking on the phone, driving).

Common Causes of CTS

Diseases or conditions that may increase the chances of developing CTS include broken or dislocation of wrist bones, pregnancy, diabetes, thyroid problems, menopause and/or obesity. Repetitive and forceful grasping with the hands or repetitive bending of the wrist may also contribute. Any repetitive motions that cause significant swelling, thickening or irritation of the membranes around the tendons in the carpal tunnel can result in pressure on the median nerve, disrupting transmission of sensations from the hand up to the arm and to the central nervous system.

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Diagnosing CTS

It is important to seek medical assistance when you first notice persistent symptoms. Do not wait for the pain to become intolerable.

Before a doctor can recommend a course of treatment, (s)he will perform a thorough evaluation of the condition, including a medical history, physical examination and diagnostic test. The doctor will document symptoms and ask about the extent to which these symptoms affect daily living. The physical examination will include assessments of sensation, strength and reflexes.

If nonsurgical treatment such as medication, bracing or physical therapy does not provide sufficient relief, the doctor may perform diagnostic studies to determine if surgery is an effective option.

These diagnostic studies may include:

- **X-ray:** To look at the bones of the wrist to determine if any abnormalities may contribute to CTS
- **EMG/NCS** (Electromyogram and Nerve Conduction Study): These tests show how the nerves and muscles are working together. They measure the electrical impulse along nerve roots, peripheral nerves and muscle tissues.

Conservative (Nonsurgical) Treatments

The main purpose of treatment is to reduce or eliminate repetitive injury to the median nerve. In some cases, CTS can be treated with immobilizing the wrist in a splint to minimize or stop pressure on the nerve. If that does not work, some patients may benefit from anti-inflammatory medications, icing the wrist or possible injection in the wrist to reduce swelling. Specific hand and wrist exercises may be helpful; rest may be helpful. Adjusting the environment to minimize or eliminate aggravating factors may be helpful. Treatment of, or maximizing management of medical disorders such as diabetes and thyroid problems, and/or weight loss where appropriate is in the patient's best interest and may improve symptoms. Physical therapy, along with avoidance of aggravating activities whenever able, may prove beneficial. Nonsurgical measures may continue for one to two months.

Surgical Treatment

Only a small percentage of patients require surgery. Factors leading to surgery include the presence of persistent neurological symptoms and lack of response to conservative measures. If the patient experiences severe pain that cannot be relieved through rest, rehabilitation or nonsurgical management, he or she may be a candidate for one of several surgical procedures that can be performed to relieve pressure on the median nerve. The most common procedure is called carpal tunnel release, which can be performed using an open incision or endoscopic techniques.

The open incision procedure involves the surgeon opening the wrist and cutting the ligament at the bottom of the wrist to relieve pressure. The endoscopic procedure involves smaller incision(s), using a miniaturized camera to assist in viewing the carpal tunnel. The possibility of nerve injury is slightly higher with endoscopic surgery, but the patient's recovery and return to work may be quicker.

Recovery After Surgery

At the end of surgery, a dressing will be applied to the patient's hand. He or she may require extra assistance at home with everyday activities, because the postop hand will need to be protected while healing. For good healing, avoid wetness on the stitches and skin. Stitches are removed about two weeks after surgery. Avoid both repetitive use of the hand and hyperextension of the wrist for one month after surgery. Pain and numbness often improve soon after surgery; tenderness in the area of the incision for several months is common. A majority of patients recover completely.

Recurrence of symptoms after surgery for CTS is rare, occurring in less than five percent of patients. To avoid injuring oneself again, it may help to change the way one performs repetitive movements, the frequency with which such movements are performed and the amount of time spent resting between periods when these movements must be performed.

The AANS does not endorse any treatments, procedures, products or physicians referenced in these patient fact sheets. This information is provided as an educational service and is not intended to serve as medical advice. Anyone seeking specific neurosurgical advice or assistance should consult his or her neurosurgeon, or locate one in your area through the AANS' Find a Board-certified Neurosurgeon™ online tool.