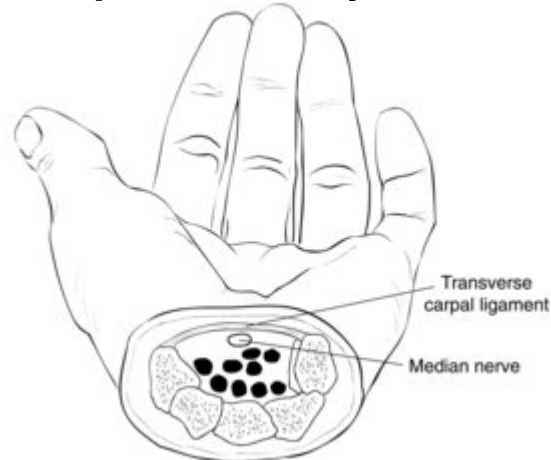


Carpal Tunnel Syndrome



Cross section of the carpal tunnel.

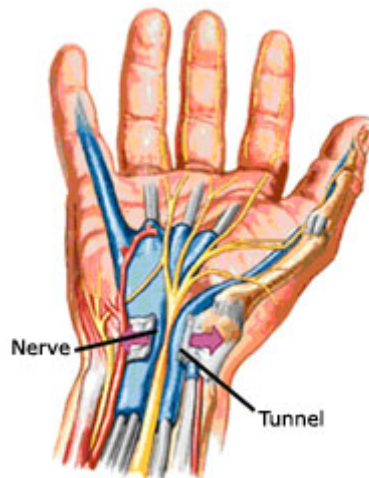
Courtesy of Griffin LY (ed): Essentials of Musculoskeletal Care. 3rd Ed. Rosemont, IL. American Academy of Orthopaedic Surgeons, 2005

Carpal tunnel syndrome is a common source of hand numbness and pain. The tendons in the wrist swell and put pressure on the median nerve, one of three major nerves responsible for supplying feeling in the hand. It is more common in women than men and affects up to 10 percent of the entire population.

Anatomy

The carpal tunnel is a narrow, tunnel-like structure in the wrist. The bottom and sides of this tunnel are formed by wrist (carpal) bones. The top of the tunnel is covered by a strong band of connective tissue, called a ligament.

The median nerve travels from the forearm into the hand through this tunnel in the wrist. The tendons that bend the fingers and thumb also travel in this tunnel.



Carpal tunnel is caused by pressure on the nerve traveling through the carpal tunnel.

Cause

Carpal tunnel is caused by increased pressure on a nerve entering the hand through the confined space of the carpal tunnel. There are many causes of carpal tunnel.

- Heredity is the most important factor.
- Hand use over time can play a role.
- Repetitive motions of the hands or wrist; that is, when the same motion is repeated over and over again over a very long period of time.
- Hormonal changes related to pregnancy and menopause.
- Medical conditions, including diabetes, rheumatoid arthritis, and thyroid gland imbalance.

In some cases of carpal tunnel, there is no known cause.

Symptoms

Symptoms usually begin gradually, without a specific injury.

- Numbness, tingling, and pain in the hand are common.
- An electric-like shocking feeling in the fingers or hand.

The thumb side of the hand is usually most involved.

Symptoms may occur at any time. Symptoms at night are common and may awaken you from sleep. During the day, symptoms frequently occur when holding something, like a phone, or when reading or driving. Moving or shaking the hands often helps decrease symptoms.

Sometimes strange sensations and pain will travel up the arm toward the shoulder. Symptoms initially come and go, but over time they may become constant. A feeling of clumsiness or weakness can make delicate motions, like buttoning buttons, difficult. These feelings may cause you to drop things. If the condition is very severe, muscles in the palm may become visibly wasted.

Diagnosis

Your doctor will make the diagnosis by discussing your symptoms and by performing a number of physical tests, such as the following:

- Ask you to straighten the thumb while it is being held to determine whether there is any weakness in the median nerve (thumb abduction strength test)
- Ask you to extend the arms and relax the wrists to see whether you experience any numbness or tingling in the wrists (Phalen maneuver)
- Press down on the median nerve in the wrist to determine whether there is any sign of numbness or tingling. (Durkan carpal tunnel compression test)
- Tap along the median nerve in the wrist to see whether tingling is produced in any of the fingers
- Tell you to close your eyes and ask you whether you feel the pressure of two light pin-point touch on the fingertip of the affected hand. If you have carpal tunnel syndrome, you may be unable to distinguish two pin-point touches that are closer than 5 mm as separate points

Your doctor may order X-rays of the wrist if you have limited wrist motion. If symptoms continue to bother you, electrical testing of the nerve function (electrophysiological tests) is often performed to help confirm the diagnosis and clarify the best treatment option in your case.

Treatment

If diagnosed and treated early, carpal tunnel syndrome can be relieved without surgery.

Nonsurgical Treatment

Treatment often begins with a brace or splint worn at night to keep the wrist in a natural position. Splints can also be worn during activities that aggravate symptoms.

Simple medications can help decrease pain. These medications include anti-inflammatory drugs (NSAIDs), such as ibuprofen.

Changing patterns of hand use to avoid positions and activities that aggravate the symptoms may be helpful.

A corticosteroid injection will often provide temporary relief, but symptoms may come back.

Surgical Treatment

Surgery may be considered if carpal tunnel syndrome continues to bother you and you do not gain relief from nonsurgical treatments. The decision whether to have surgery is based mostly on the severity of the symptoms.

- If the symptoms are severe and won't go away, your doctor may consider surgery.
- In more-severe cases, surgery is considered sooner because other treatment options are less helpful.
- In very severe cases, surgery may be recommended to prevent irreversible damage.

Technique. Generally, carpal tunnel surgery is done on an outpatient basis under local anesthesia.

During surgery, a cut (incision) is made in the palm or wrist. The roof of the carpal tunnel is cut. This increases the size of the tunnel and decreases pressure on the nerve.

Some surgeons use a smaller incision and use a small camera (endoscope) to carry out the surgery.

Considerations. Risks from the surgery include bleeding, infection, and nerve injury. Some pain, swelling, and stiffness can be expected. Minor soreness in the palm is common for several months after surgery. Severe problems are rare. You may be instructed to elevate your hand and move your fingers after surgery. This helps minimize swelling and stiffness.

Recovery. Most patients see their symptoms improve after surgery, but recovery may be gradual. On average, grip and pinch strength generally return by about 2 months after surgery. Complete recovery may take up to a year. If significant pain and weakness continue for more than 2 months, your physician may instruct you to work with a hand therapist. If carpal tunnel syndrome has been present longer and the nerve is more severely affected before treatment is attempted, recovery is slower and less complete.



Co-developed with the American Society for Surgery of the Hand

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