

Carpal Tunnel Syndrome

Carpal tunnel syndrome is one of the most common neurological disorders seen by neurologists. It occurs when a nerve in the wrist called *the median nerve* becomes compressed under the main ligament in the wrist known as the transverse carpal ligament. This ligament forms a roof over the "tunnel" formed by the bones and tendons in the wrist. The median nerve and the main vein of the hand pass under this ligament. Due to various causes, this "carpal tunnel" becomes too narrow. This results in the median nerve and the vein next to it becoming compressed. It is the pressure on the median nerve that causes many of the symptoms associated with carpal tunnel syndrome.

Early in the course of CTS, patients can experience numbness in one or both hands. Carpal tunnel syndrome frequently affects both hands. All the fingers, except the little finger, can be affected. The pins-and-needles numbness is more commonly noticed at night and may wake a patient from their sleep. Pain is a commonly occurring symptom as well. The pain can be in the hands, wrists or even going up the forearms. As carpal tunnel syndrome progresses, weakness in the hand grip can develop. This may first be noticed by occasionally dropping objects. With worsening of the syndrome, patients can have difficulty opening jar lids, tight doors and even turning the car key in the ignition switch. Although the numbness is originally intermittent, it can become constant. The hand swelling that is seen with CTS is due to the vein running under the carpal ligament becoming compressed. As the blood flow draining out of the hand is partially restricted, this can result in some hand swelling.

Typically patients will wake up in the middle of the night with pain, numbness and swelling in their hands. They will "shake the numbness out" of their hands. Other activities that will trigger CTS symptoms include holding the steering wheel, reading the newspaper or using various hand and power tools. Typing or using a computer much of the day will also bring on symptoms. Symptoms of CTS are brought on by flexing (bending) the wrist. This is why this condition is worse at night. It is our natural tendency to sleep with our wrists flexed.

Various medical conditions can predispose someone to developing carpal tunnel syndrome. It is more common to see this condition in women. Carpal tunnel syndrome is not uncommonly seen also during pregnancy. Other conditions such as low thyroid, diabetes, arthritis and wrist trauma can all predispose someone to developing CTS.

Diagnosis of CTS is not always as straight forward as it may seem. Patients can present with different collection of symptoms. Pain is not always an accompanying problem. It takes a detailed neurological history and physical exam to evaluate the patient. Many times, a patient will have symptoms of carpal

tunnel syndrome and then turn out not to have the condition. The absolute way to diagnose this, after the physical exam, is to perform a test called a ***nerve conduction study***. During this test, electrodes are put in specific places on the hands and fingers. A small impulse is then applied to the nerve and a recording device measures how fast the impulse is carried down the nerve. If there is nerve compression the conduction speed slows down.

Non-surgical treatment is the preferred method for treating carpal tunnel syndrome. This consists of wrist splints that keep the wrist in a neutral position and prevent wrist flexion. Doing this reduces the compression on the median nerve thereby allowing healing over a 2-6 month period of time. The splints should be worn all night and as much of the day as reasonably possible. If a patient's symptoms continue to worsen and the diagnosis is confirmed by electrical studies, then surgical decompression of the median nerve may be necessary. This is done under local anesthesia, where the lower arm is anesthetized. A small incision is then made over the carpal tunnel ligament and the ligament is then cut to eliminate pressure on the median nerve. Although one can use the hand that was operated on the next day, it is best to avoid unnecessary strain on the surgical area until complete healing occurs, usually about five weeks.

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