

Carpal Tunnel Syndrome (CTS):

And its Effect on One's Lifestyle

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Carpal tunnel syndrome, also known as Median nerve entrapment or Median nerve dysfunction, is a condition that affects the hand and wrist. CTS involves the swelling of tendons located inside the carpal tunnel space and pain arises from pressure placed on the median nerve. The median nerve runs from the forearm into the palm of the hand, compression of the median nerve can result in numbness, tingling, pain and loss of function of the hand. The combination of these symptoms results in carpal tunnel syndrome.

Carpal tunnel is a fairly common condition that develops with the onset of a variety of reasons. Recent research in America reported that most surgeons perform over sixty-five CTS operations every year. Statistics also report that this problem is more frequent among women and is predominantly associated with aging. Women are three times more likely to develop CTS than the average male, due to anatomical differences such as physically having a smaller carpal tunnel.

The development of carpal tunnel syndrome is associated with overused repetition of a single hand motion. The tendons of the hands are covered with a lining that produces a natural lubricant to the tendons, named the synovium, which allows the tendons to slide smoothly as you use your hands. The repetitive motion of the hand and wrist causes this lubrication system to malfunction. The reduced lubrication results in inflammation and swelling of your wrist area. Repeated

occurrences of this swelling causes the synovium to thicken, which increases the pressure placed on the median nerve and the build-up ultimately prevents the tendon from moving.

The symptoms of carpal tunnel syndrome usually begin gradually and are described generally as burning, tingling, or numbness in the palm of the hand and in the digits, especially the thumb, index, and middle fingers. The symptoms often begin in one or both hands in the night, while patients flex their wrists in their sleep. As these indicators worsen, people start to feel this tingling during the day and feel relief by shaking or massaging their hands.

Carpal tunnel syndrome is deemed to be the result of a combination of factors that increase pressure on the tendons and median nerve within the carpal tunnel. The exact cause of CTS has not been pinpointed and remains unclear to this day, however many factors can increase ones risk of developing the condition. Although any of the factors on their own do not cause CTS, the combination of them may increase the chance of developing damage or stress to the median nerve. Main factors are usually either genetically predisposed or otherwise commonly, work-related.

Contributing anatomic factors such as wrist-area traumas or injuries will induce initial swelling and create additional pressure on the median nerve, which can create a domino effect causing more severe CTS. Diabetes and other chronic illnesses can increase ones risk of nerve damage, including but not limited to the median nerve. A patient with rheumatoid arthritis or other inflammatory conditions is more susceptible to inflammation in the wrist tendons, which will in turn exert

more pressure on the median nerve. People with imbalances of hormones and bodily fluids are commonly more susceptible to carpal tunnel syndrome, as well. CTS is often associated to people undergoing pregnancy, thyroid imbalances, kidney disorders, obesity and menopause, as their fluid retention levels are frequently fluctuating and can cause swelling and increase pressure within the carpal tunnel. Fortunately, pregnancy-related CTS generally goes away on its own as soon as the pregnancy is over.

Workplace factors are frequently associated with carpal tunnel syndrome. Carpal tunnel syndrome development is not restricted to any single profession or industry, but it appears that factory workers, running an assembly line, have increased probability of developing CTS. People who work in manufacturing, sewing, meatpacking and cleaning statistically have a higher chance of developing CTS. It is possible that working at a job that requires repetitive hand motions and prolonged wrist flexing contributes to the development of CTS, however, present scientific evidence is unclear and often conflicting. To this day, these factors haven't been proven to be direct causes of carpal tunnel syndrome but are understood to assist in the progress of any present median nerve damage.

After the initial development of the symptoms, doctors can conduct a variety of different tests to determine whether a patient has CTS. An early diagnosis allows milder treatment options to avoid irreversible damage to the median nerve. Physicians generally begin with simple physical examinations, checking wrists for tenderness and swelling. Fingers are individually tested for changes in sensation and strength. If any inferior indicators arise, the physician may begin to examine the

patient more closely by preparing carpal tunnel specific laboratory tests. The Tinel test and Phalen test is most commonly used to diagnose CTS. During the Tinel test, the doctor taps the median nerve at the wrist. The test is positive when tingling sensation occurs in the fingers. The Phalen test, also known as the wrist-flexion test, requires the patient to keep wrists bent downward for one minute. If the symptoms, such as tingling and numbness, can be reproduced in the finger within the minute time span, the test suggests that the patient may have carpal tunnel syndrome. To confirm the diagnoses, electromyography is used. In this form of testing, electrodes are placed on the wrist and hand of the patient. Mild electric pulses are applied to allow measurements of the speed and quality of median nerve transmission responses to dictate the amount of damage to the nerve. Ultrasounds and x-rays can also show the impairment of movement of the median nerve.

Treatment options depend on the severity of the patients CTS progress and should begin as soon as it is diagnosed. Early treatment generally involves resting the mildly affected wrist by immobilizing it in a splint, to avoid any further damage from bending or stretching. The swelling is relieved during the rest period. If the condition requires further treatment, one may choose to undergo surgical or nonsurgical options depending on the severity. Nonsurgical procedures such as exercise and drugs are administered to ease the pain and swelling. Drugs such as oral anti-inflammatories and diuretics are used to reduce membrane swelling. Corticosteroid injections are injected directly into the wrist to immediately relieve pressure on the median nerve, but the effect is temporary and prolonged use is strongly discouraged. If the patient's symptoms persist or remain severe after

applying nonsurgical therapy, physicians turn to carpal tunnel surgery. The goal is to relieve the pressure on the nerve by cutting the ligament directly pressing on the median nerve. The healing process following the surgery, allows the ligament tissue to gradually regrow together while leaving more room for the nerve than before. After completion of the surgery, doctors recommend specific physical activities to strengthen the muscles again and increase flexibility of the hand and wrist.

In order to avoid the trauma of surgery and the pain associated with carpal tunnel syndrome, one must take good care of themselves and work towards the prevention of CTS. There are no proven methods to prevent CTS, but minimizing stress on the hands and wrists is key in avoidance and precautions can be made to reduce damage to the median nerve. In an ergonomic workplace environment, workers can do conditioning and stretches to strengthen tendons, use correct posture, and take frequent breaks for rest. The aftermath of consistent stress on the wrist is tedious and longstanding, therefore it is important to remember to take breaks from repetitive activities involving the use of hands and frequently stretch and rotate the palms and wrists. These precautions will ultimately allow one to the negative impacts related to carpal tunnel syndrome.