

# TerranearPMC Safety Share

## Week of May 7, 2018 – Carpel Tunnel Syndrome

**Carpal tunnel syndrome (CTS):** this is a condition that is caused when the main nerve in either wrist – known as the median nerve - gets compressed as it travels through the tight space in the wrist; most commonly known as the carpal tunnel. As a result of the median nerve getting compressed (or pinched) one may experience pain, numbness, or even tingling in the thumb, index finger, middle finger, as well as the thumb side of the ring fingers. Pain may even extend up the arm. Other symptoms, such as a weak grip may occur and after a long period of time, the muscles at the base of the thumb may deteriorate.

The median nerve can usually move up to 9.6 mm to allow the wrist to flex, and to a lesser extent during extension. Long-term compression of the median nerve can inhibit nerve gliding, which may lead to injury and scarring. When scarring occurs, the nerve will adhere to the tissue around it and become locked into a fixed position so that less movement is apparent.

Studies have shown that wrist flexion increases the typical pressure within the carpal tunnel 8-fold, while extension increases it 10-fold. Repetitive flexion and extension in the wrist significantly increase the fluid pressure in the tunnel through thickening of the synovial tissue, (aka synovitis) which that lines the tendons within the carpal tunnel, thereby, creating a constant pressure on the median nerve.

CTS risk factors include obesity, repetitive wrist work, pregnancy, and rheumatoid arthritis. Currently, there is tentative evidence that hypothyroidism (underactive thyroid) also increases the risk of CTS. Types of work that are associated with CTS include computer work, work with vibrating tools, and work that requires a strong grip: all activities that involve the wrist. Diagnosis is suspected based on signs, symptoms, and specific physical tests and may be confirmed with electrodiagnostic tests.

About 5% of people in the United States have CTS. It usually begins in adulthood, while women are more commonly affected than men. Up to 33% of people may improve without specific treatment over approximately a year.

Over the past few decades, CTS has been associated with occupational settings or work tasks, such as continuous repetitive wrist motions, while external force, awkward posture, and vibration have also been cited. Nevertheless, the relationship between work and CTS remains controversial while an ongoing international debate regarding the relationship between CTS and the workplace continues. Currently the Occupational Safety and Health Administration (OSHA) has not formerly promulgated any regulations that address CTS in the workplace; although OSHA has published a number of ergonomic guidelines for various industries (such as nursing homes, poultry processing and shipyards) as a way to discuss preventative measures. However, these guidelines discuss the broader topic of musculoskeletal disorders as opposed to the more specific condition of CTS.

Data assembled by the National Institute for Occupational Safety and Health (NIOSH) has indicated that job tasks that involve highly repetitive manual acts on specific wrist postures were associated with incidents of CTS, but causation was not established and the distinction from work-related arm



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pains that are not carpal tunnel syndrome was not clear. It has been proposed that repetitive use of the arm can affect the biomechanics of the upper limb or cause damage to tissues. It has also been proposed that postural and spinal assessment along with ergonomic assessments should be included in the overall determination of the condition. Addressing these factors has been found to improve comfort in some studies. A 2010 survey by NIOSH showed that 2/3 of the 5 million carpal tunnel cases in the US that year were related to work (Women have more work-related carpal tunnel syndrome than men).

Speculation that CTS is work-related is based on claims such as CTS being found mostly in the working adult population, though evidence is lacking for this. For instance, it has been noted that most patients were older and not working. Based on the claimed increased incidence in the workplace, arm use is implicated, but the weight of evidence suggests that this is an inherent, genetic condition which is then diagnosed as progressive idiopathic peripheral mononeuropathy. In layman's terms, this means that these cases are more closely aligned as an undetermined cause which involves nerve damage to the peripheral nervous system.

Other causes of CTS include intrinsic factors that exert pressure within the carpal tunnel, as well as extrinsic factors (pressure exerted from outside the tunnel), which include benign tumors such as lipomas, ganglion, and vascular malformation.

Being physically active can decrease the risk of developing CTS. Symptoms can be improved by wearing a wrist splint or with corticosteroid injections. Surgery to cut the transverse carpal ligament is effective, while evidence does not support magnet therapy.

Generally accepted treatments include: physiotherapy, steroids either orally or injected locally, splinting, and surgical release of the transverse carpal ligament. Limited evidence suggests that gabapentin is no more effective than any placebo for CTS treatment. And, unfortunately, there is insufficient evidence for therapeutic ultrasound, yoga, acupuncture, low level laser therapy, vitamin B6, and exercise.

The American Academy of Orthopedic Surgeons recommends proceeding conservatively with a course of nonsurgical therapies tried before surgery is considered. A different treatment should be tried if the current treatment fails to resolve the symptoms within 2 to 7 weeks. Early surgery with carpal tunnel is indicated where there is evidence of median nerve denervation or a person elects to proceed directly to surgical treatment. Recommendations may differ when carpal tunnel syndrome is found in association with the following conditions: diabetes mellitus, coexistent cervical radiculopathy, hypothyroidism, polyneuropathy, pregnancy, rheumatoid arthritis, and carpal tunnel syndrome in the workplace.

Suggested healthy habits such as avoiding repetitive stress, work modification through use of ergonomic equipment (mouse pad, taking proper breaks, using keyboard alternatives such as a digital pen, voice recognition, and dictation), have been proposed as methods to help prevent carpal tunnel syndrome. While some health professionals have suggested a daily B-vitamin supplement intake for preventing/treating CTS, current evidence does not support this claim.

**To be yourself in a world that is constantly trying to make you something else is the greatest accomplishment** - Ralph Waldo Emerson

