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## Carpal Tunnel Syndrome (CTS)

Carpal tunnel syndrome (CTS) is a relatively common complaint in individuals that perform constant and repetitive motions of the hand and wrist. Any athlete that plays a sport that requires them to repeatedly grasp something while the wrist joint is twisting and turning are at a high risk of developing the complaint.

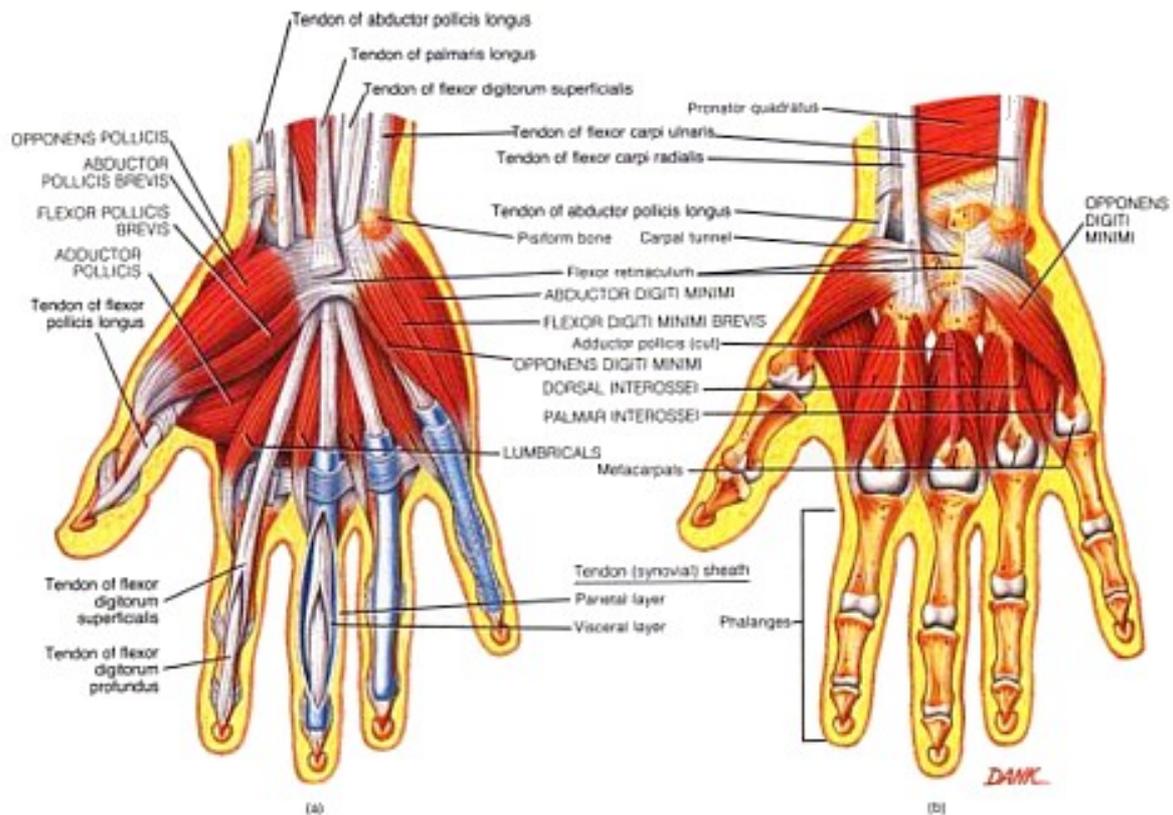
Sports that have a high incidence of CTS sufferers include most racquet sports, handball, swimming, body building, rowing, golf, archery and rock climbing, although any sport that involves prolonged use of the wrist and hand can cause the condition.

### What is Carpal Tunnel Syndrome?

Carpal tunnel syndrome is a compression neuropathy in which the median nerve that runs from the forearm to the hand becomes entrapped in the region of the wrist. This entrapment means that the thumb and the first three fingers, as well as the majority of the palm can, and often do, become numb. The median nerve also supplies limited movement to the thumb through the "Thenar" muscles (the lump at the base of the thumb) and so the condition normally causes partial paralysis of the thumb.

### Anatomy of the Wrist

As already mentioned carpal tunnel syndrome is caused by the entrapment and compression of the median nerve. This nerve runs from the forearm to the hand where it branches to supply innervations to the thumb and the first two fingers.



As it traverses the wrist area, the nerve passes through the carpal tunnel, which is composed of the carpal bones and the transverse carpal ligament. The carpal bones make up the base and sides of the tunnel so that a semicircular shape or valley is formed. Stretched across this, much like a bridge that crosses the valley is the tough transverse ligament.

The median nerve, along with nine tendons that give the thumb and fingers movement, pass through the tunnel and into the hand. The carpal tunnel is a rigid structure and the inner space is fixed and very confined.

### Causes of Carpal Tunnel Syndrome

Carpal tunnel syndrome is ultimately an inflammatory disease and so any sport or pastime that is repetitive in its actions can cause either the muscles or the tendons of the wrist to become irritated and inflamed.

In addition to the median nerve, a set of nine tendons also run through the carpal tunnel. When the protective linings, or synovial sheaths, of these tendons become swollen and inflamed this puts excessive pressure firstly on the tendons but also on the median nerve because of the limited amount of space within the tunnel. Other ways in which the

pressure becomes increased is when the tough transverse carpal ligament becomes swollen and when a bone fracture or break causes oedema or the build-up of fluids.

When the median nerve becomes compressed because of the excess pressure in the carpal tunnel, the nerve signals that are normally transmitted through the nerve become slowed which ultimately results in abnormal sensations in the affected hand i.e. numbness, pins and needles or a tingling, burning feeling.

## Signs and Symptoms

The majority of the symptoms felt by sufferers of carpal tunnel syndrome are ultimately due to the entrapment of the median nerve. Common symptoms include:

- Weakness in the affected hand which affects grip. Many sufferers find that picking up a bag or opening a door becomes difficult because they can no longer grip with enough force.
- A feeling of numbness in the thumb, fingers (not the little finger) and the thumb-side of the palm. Alternatively some individuals may have a tingling sensation instead.
- Impaired coordination of the thumb and forefingers so that fine movements become difficult.
- Pain in the wrist and hand that can stretch up as far as the elbow. The pain that is associated with carpal tunnel syndrome is not actually caused by the nerve compression; rather it is caused by inflammation or by a bone fracture which in turn causes the nerve compression. Most cases of CTS cause absolutely no damage to the nerve itself and so when the pressure is relieved the symptoms abate.
- Tinel's sign - this is a diagnostic test which involves tapping the carpal tunnel area lightly to see if a sharp pain is felt. If pain is felt then a diagnosis of CTS is generally given.

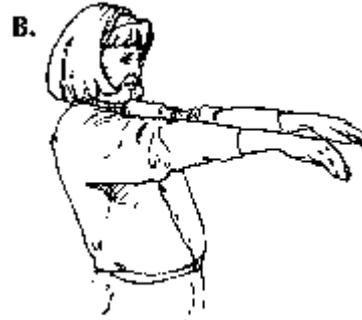
## Exercises

These exercises are more successful in patients with mild symptoms, and are not recommended for patients with severe symptoms. Patients who have persistent symptoms despite these exercises should discuss surgical treatment with their doctor.

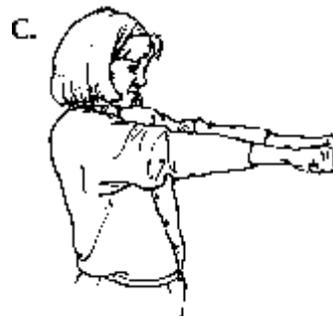
Extend and stretch both wrists and fingers acutely as if they are in a hand-stand position. Hold for a count of 5.



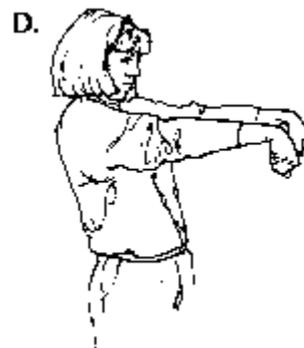
Straighten both wrists and relax fingers.



Make a tight fist with both hands.



Then bend both wrists down while keeping the fist. Hold for a count of 5.



Straighten both wrists and relax fingers, for a count of 5.



The exercise should be repeated 10 times.  
Then let your arms hang loosely at the side and shake them for a few seconds.

