

## Carpal Tunnel Syndrome

Carpal tunnel syndrome (CTS) is a common condition affecting the wrist and hand. It occurs mainly in women ages 40-60, but can also occur in men. CTS occurs when the median nerve becomes compressed in an area called the carpal tunnel, usually due to an increase in pressure. The carpal tunnel is a small canal located at the base of the wrist on the palm side. Inside this area is located the median nerve along with the tendons of the muscles that bend (or flex) the fingers. The median nerve begins as a branch off of the brachial plexus in the upper arm. It travels down the arm, through the carpal tunnel, and into the thumb, the index and middle finger, as well as half of the ring finger.

Carpal tunnel syndrome occurs due to prolonged compression and decreased blood flow to the median nerve, causing inflammation. Various conditions may lead to carpal tunnel including pregnancy (due to fluid retention), thyroid or hormone imbalance, diabetes, and use of certain medications. Certain types of infection can also cause carpal tunnel including rheumatoid or degenerative arthritis or lupus. Wrist injuries including sprains, strains, dislocations, or fractures of the wrist or carpal bones in the hand can injure the median nerve and cause inflammation. Any type of lesion that takes up space within the carpal tunnel such as a ganglion cyst or bone spur can also lead to CTS.

Symptoms of CTS may include pain, numbness or tingling in the median nerve distribution. These symptoms generally increase over time and tend to be worse at night. Numbness, tingling, and pain may also get worse during activities requiring prolonged wrist flexion or extension or with excessive use of the fingers. If compression of the median nerve continues for a prolonged time the muscles in the wrist may become weak and cause difficulty with gripping and picking up objects. Symptoms will become more constant as the condition progresses.

Carpal tunnel syndrome can be treated in various ways. Initially, a patient may be instructed to wear a wrist splint to maintain a neutral position for decreased pressure on the median nerve. If splinting the wrist is unsuccessful, steroid injections can be given to decrease inflammation. CTS may also be successfully treated with physical therapy. A physical therapy evaluation and treatment may consist of examination of the affected hand, wrist, arm, and neck for proper diagnosis. Wrist and grip strength, range of motion (ROM) measurements, sensory and special testing will also be performed to determine if there is a diagnosis of CTS. A physical therapist will be able to educate the patient on avoidance of certain activities/positions, posture, nerve gliding exercises, stretching, and strengthening for the upper extremity. The goal of physical therapy treatment is to improve the function of the hand and reduce symptoms so that a patient may return to their desired athletic, work, and daily activities pain free.

In severe cases of carpal tunnel where conservative treatment is unsuccessful, surgery may be indicated. The primary surgical procedure consists of cutting the transverse carpal ligament to open the carpal tunnel and release pressure from the median nerve. Physical therapy may also be indicated following surgery.