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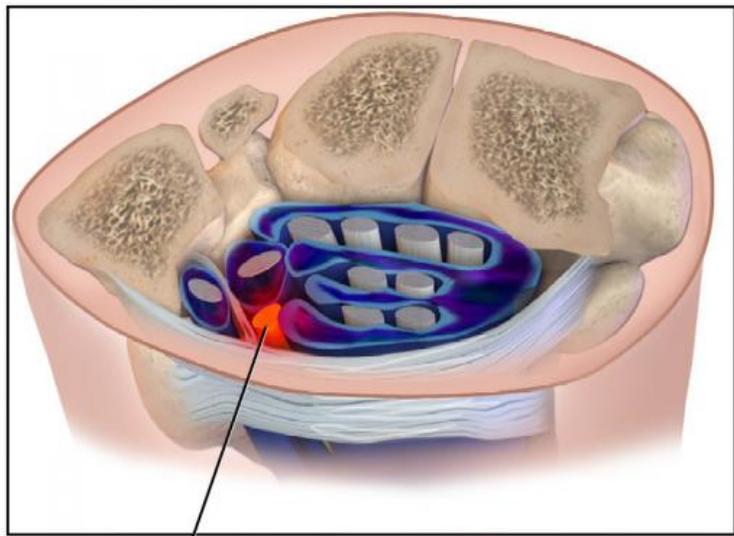
Carpal Tunnel Syndrome

by **David R. Steinberg, MD**

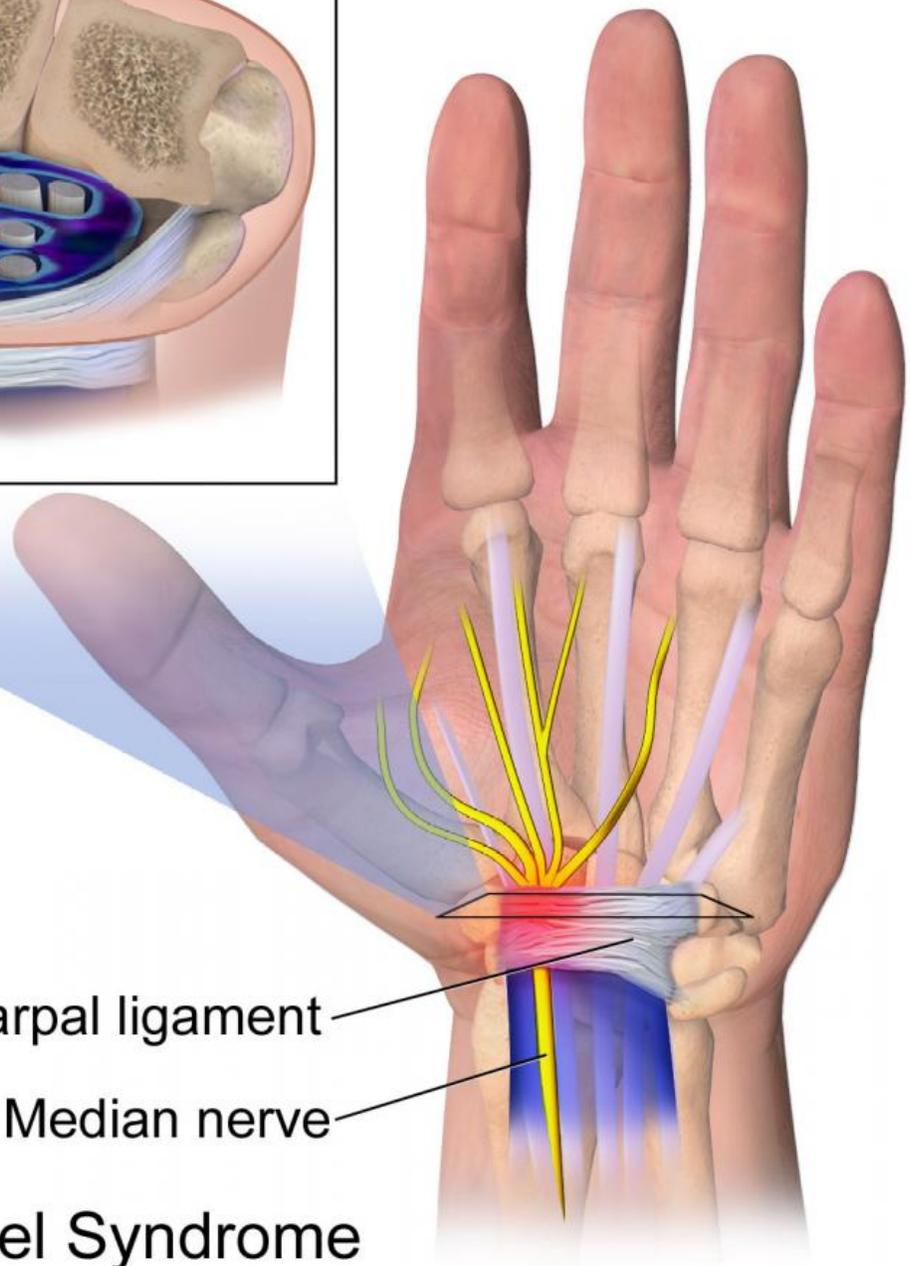
Carpal tunnel syndrome is a painful compression of the median nerve as it passes through the carpal tunnel in the wrist.

- The cause of most cases of carpal tunnel syndrome is unknown.
- The fingers and palm near the thumb can tingle and become numb.
- Doctors base the diagnosis on an examination and, if needed, the results of nerve function tests.
- Symptoms can usually be relieved by pain relievers, a splint, or sometimes injection of a corticosteroid or surgery.

Carpal tunnel syndrome results from compression of the median nerve, which is located at the palm side of the wrist (an area called the carpal tunnel, which is called a tunnel because it is a narrow passageway created by fibrous tissue through which nerves and tendons pass through the wrist to the hand). The median nerve serves the thumb side of the hand. The compression results when swelling or bands of fibrous tissue form for a variety of reasons on the palm side of the wrist.



Compressed nerve



Carpal ligament

Median nerve

Carpal Tunnel Syndrome

blausen

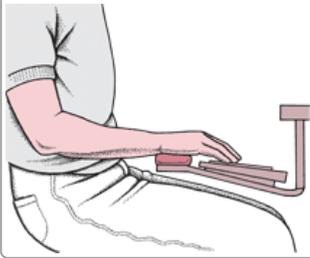
Carpal Tunnel Syndrome

CAUSES

Carpal tunnel syndrome is common—especially among women aged 30 to 50 years—and may affect one or both hands. At risk are people whose work requires repeated forceful movements with the wrist extended, such as using a screwdriver. Another potential (but controversial) factor is use of a computer keyboard that is not positioned properly. Prolonged exposure to vibrations (for example, by using certain tools) has also been claimed to cause carpal tunnel syndrome. Pregnant women and people who have diabetes, an underactive thyroid gland, certain forms of amyloidosis, or rheumatoid arthritis are at increased risk of developing carpal tunnel syndrome. However, most cases develop for unknown reasons.

Proper Keyboard Position

Using a computer keyboard that is positioned improperly may cause or contribute to carpal tunnel syndrome. To prevent injury, the user should keep the wrist in a neutral position. That is, the line from the hand to the forearm should be straight. The hand may be slightly lower than the forearm. But the hand should never be higher, and the wrist should not be cocked. The keyboard should be positioned relatively low, keeping the hand slightly lower than the elbow. A wrist pad can be used to support the wrist.



SYMPTOMS

The symptoms, due to the nerve compression, are odd sensations, numbness, tingling, and pain in the first three fingers and half of the fourth finger on the thumb side of the hand. Sometimes the entire hand may be affected. Occasionally, there is also pain and a burning or tingling sensation in the arm. Burning or aching pain with numbness and tingling often wake people at night because of the way the hand is positioned. The person may shake the hand to try to restore normal feeling. With time, the muscles in the hand on the thumb side can weaken and shrink through lack of use (atrophy).

DIAGNOSIS

The diagnosis is made largely by examining the affected hand and wrist. A doctor may do nerve conduction studies (see [Electromyography and Nerve Conduction Studies](#)) to be certain that the problem is carpal tunnel syndrome, particularly if surgery is being considered.

TREATMENT

Avoiding positions that overextend the wrist or put extra pressure on the median nerve and adjusting the angle of a computer keyboard sometimes provide some relief. Wearing wrist splints that hold the hand in a neutral position (especially at night) and taking mild pain relievers often help. Treating underlying disorders (such as rheumatoid arthritis or an underactive thyroid gland) can help relieve symptoms.

Injections of a corticosteroid suspension into the carpal tunnel occasionally bring long-lasting relief. If pain is severe or if the muscle atrophies or weakens, surgery is the best way to relieve pressure on the median nerve. A surgeon can cut away the bands of fibrous tissue that place pressure on the nerve.

Last full review/revision September 2013 by David R. Steinberg, MD

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