

# Carpal Tunnel Syndrome

## Definition

The **median nerve**, which controls movement and feeling in the palm-side of the hand, runs from the forearm to the hand through the **carpal tunnel** in the wrist. The bottom and sides of this tunnel are formed by bones, and the top of the tunnel is covered by a strong band of connective tissue called a **ligament**.

Repetitive movement, or certain conditions such as pregnancy and arthritis, can cause swelling within the carpal tunnel. The swelling puts pressure on the median nerve and can cause numbness, tingling, or pain in the thumb or fingers. This is known as **carpal tunnel syndrome**.

## Cause

Carpal tunnel syndrome usually does not have one specific cause. Any action or condition that contributes to swelling within the carpal tunnel can be a factor.

Tasks associated with carpal tunnel syndrome often involve:

- Repetitive hand motions.
- Awkward hand positions.
- Strong gripping.
- Mechanical stress on the palm.
- Vibration.

Medical conditions associated with carpal tunnel syndrome include:

- Arthritis.
- Diabetes.
- Gout.
- Amyloidosis (the build up of abnormal proteins in the body's organs).
- Hypothyroidism (subnormal activity of the thyroid gland).
- Tendon sheath tumors.
- Wrist fractures and dislocations.
- Wrist cysts.

In women, carpal tunnel syndrome can occur with:

- Pregnancy.
- Use of oral contraceptives.
- Menopause.
- Gynecological surgery.

## At-Risk Groups

Women appear to be more susceptible to developing carpal tunnel syndrome than men. Some people are more prone because they naturally have narrower carpal tunnels than the average person.

## Symptoms

The first sign of carpal tunnel syndrome is usually pain in one or both hands. This can happen during activity or in the middle of the night, and be severe enough to interrupt sleep. Other symptoms may include:

- Tingling or pain in the thumb or fingers.
- Pain that moves from the palm or fingers to the arm.
- Weakness in the thumb and fingers, difficulty squeezing things .
- Numbness in the fingers.
- Difficulty telling hot from cold with the fingers.

## Complications

If carpal tunnel syndrome is allowed to progress without treatment, it may cause nerve or muscle damage. People with symptoms that disrupt normal activity should seek medical attention as soon as possible.

## Diagnosis

Because carpal tunnel syndrome is a common problem, doctors often suspect it based on the symptoms and their timing. During the examination, the doctor may press on the wrist to see if it will cause any symptoms. The doctor may also check to see if symptoms are present in the little finger, which is not affected by carpal tunnel syndrome. An X-ray might be ordered to rule out other problems, like arthritis or a **fracture** (break) in the wrist.

To be sure that the median nerve is involved, the doctor may order an **electromyogram** or **nerve conduction study**. In an electromyogram, a very fine needle is inserted into the muscle and used to apply small electric shocks, which are measured to determine muscle reaction. In nerve conduction studies, electrodes are taped to the skin and used to apply a small shock to the skin surface. The movement of electrical activity through the carpal tunnel is measured.

## Treatment

The first course of treatment usually involves trying to manage the swelling in the wrist without surgery. Techniques for this include:

- **Splinting** (wearing a splint to keep the patient from bending the wrist during activity or sleep).
- **Physiotherapy** (doing special exercises to prevent swelling from returning after treatment).
- Medication (**non-steroidal anti-inflammatory drugs**, or **NSAIDs**, help some people control swelling).
- **Cortisone** (injection directly into the wrist to reduce swelling).

Carpal tunnel syndrome that does not respond to these options may require surgery. The operation, called a **carpal tunnel release**, involves cutting the ligament at the top of the carpal tunnel to make more room for the median nerve.

### **Prognosis (Expectation)**

Patients treated by surgery usually do not have any more symptoms. Patients treated by non-surgical methods must continue preventive measures to keep the symptoms from returning.

### **Tips**

People at risk of developing carpal tunnel syndrome may be able to prevent it by using the following precautions:

- Perform stretching exercises and take frequent breaks from repetitive activities.
- Keep the forearms and wrists straight, wearing a splint when needed.
- Make the work area as comfortable and supportive as possible, and avoid pressure on the wrists.
- Keep the wrists warm.

### **For More Information**

For more information on carpal tunnel syndrome, contact the following resources:

#### **American Chronic Pain Association (ACPA)**

P.O. Box 850  
 Rocklin, CA  
 95677-0850  
 ACPS@pacbell.net  
 Phone: (916) 632-0922  
 Fax: (916) 632-3208

#### **Occupational Safety & Health Administration**

U.S. Department of Labor  
 200 Constitution Avenue, NW  
 Washington, DC  
 20210  
<http://www.osha.gov>  
 Phone: (800) 321-OSHA (-6742)

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References:

National Institute of Neurological Disorders and Stroke

<http://www.ninds.nih.gov>

American Association of Orthopedic Surgeons

<http://www.orthoinfo.aaos.org>

MayoClinic.com

<http://www.mayoclinic.com>

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