



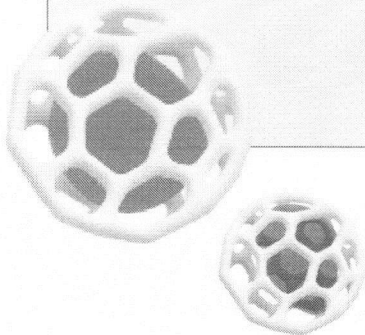
OrthoInfo Basics

Carpal Tunnel Syndrome

Carpal tunnel syndrome is a common cause of hand pain and numbness.

In carpal tunnel syndrome, the major nerve to the hand is squeezed as it travels through the wrist.

Fortunately, when carpal tunnel syndrome is diagnosed early on, hand pain and numbness can be relieved with simple treatments.



What is carpal tunnel syndrome?

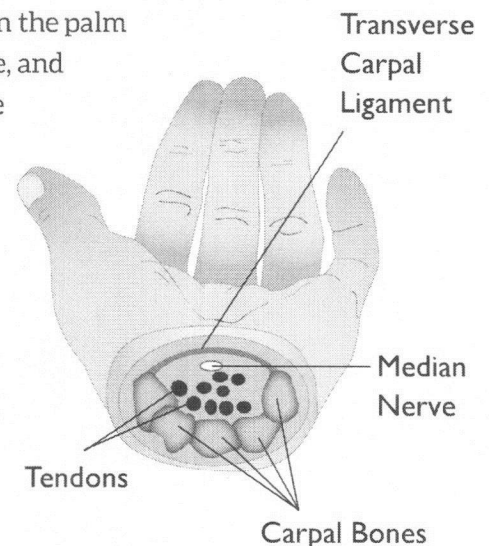
Understanding your wrist can help you better understand carpal tunnel syndrome.

Anatomy. The carpal tunnel is a narrow passageway in your wrist, about an inch wide. The bottom and sides of this tunnel are formed by wrist (carpal) bones. The top of the tunnel is covered by a strong band of connective tissue called the transverse carpal ligament.

The median nerve is one of the main nerves of your hand. It controls feeling in the palm side of your thumb, index, middle, and ring fingers. Along with the nine tendons that bend your fingers, the median nerve travels from your forearm into your hand through the narrow carpal tunnel.

How it happens. Carpal tunnel syndrome occurs when the tissues surrounding the tendons in your wrist swell and put pressure on the median nerve. These tissues are called the synovium. The synovium lubricates the tendons and makes it easier to move your fingers.

This swelling of the synovium narrows the small space of the carpal tunnel and, over time, crowds the nerve. This can result in hand pain, numbness, tingling, and weakness.



Nine tendons and the median nerve travel through the carpal tunnel.

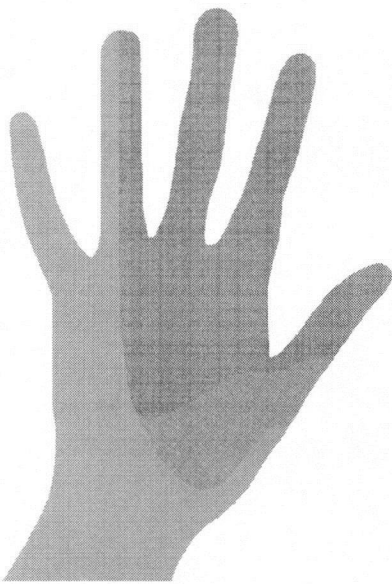
OrthoInfo Basics — Carpal Tunnel Syndrome

What causes carpal tunnel syndrome?

In most cases, the exact cause of carpal tunnel syndrome is not known.

Many things contribute to the development of the disease. Studies show that women and older people are more likely to develop carpal tunnel syndrome. There are also several other factors that can cause crowding in the carpal tunnel.

- **Heredity.** Carpal tunnels are simply smaller in some people. This trait can run in families.
- **Hand use.** Repeating the same hand motions over a prolonged period of time can aggravate the tendons and cause swelling.
- **Pregnancy.** Hormonal changes during pregnancy can cause water retention and swelling.
- **Health conditions.** Diabetes, rheumatoid arthritis, and thyroid gland imbalance are medical conditions that can cause increased swelling.



When the median nerve is compressed, pain and numbness can radiate from your thumb to your ring finger.

Is it better to get diagnosed early?

Because the disease usually worsens over time, the sooner you start treatment, the better.

After discussing your medical history, your doctor will ask you about your symptoms. Did they begin gradually and come and go? Are they worse at night? Do they occur when you are holding something, like a book or a phone? These are all common signs of carpal tunnel syndrome.

Physical tests. Your doctor will try to bring about your symptoms. He or she may bend and hold your wrists in different positions to test for tingling or numbness in your hands. Pressing down or tapping along the median nerve may also recreate your symptoms.

Electrophysiological tests. These types of tests, such as a nerve conduction study, measure how severe the pressure is on your median nerve. Results from these tests will help your doctor develop an individual treatment plan for you.

OrthoInfo Basics — Carpal Tunnel Syndrome

What are common treatments?

When treated early on, carpal tunnel symptoms can be relieved with simple measures.

Bracing or splinting. A brace or splint worn at night will keep your wrist in a neutral position. This prevents the nightly irritation to the median nerve that occurs when you curl your wrists during sleep. It can also help to wear a splint during activities that aggravate your symptoms.

Nonsteroidal anti-inflammatory medicines. Drugs like aspirin and ibuprofen reduce pain and swelling.

Activity changes. Symptoms often occur when your hand and wrist are in the same position for too long. If your job or hobby activities aggravate your symptoms, changing these activities may slow or stop progression of the disease.

Steroid injections. Cortisone is a powerful anti-inflammatory medicine that is injected into your carpal tunnel. While these injections often provide relief, painful symptoms may come back.

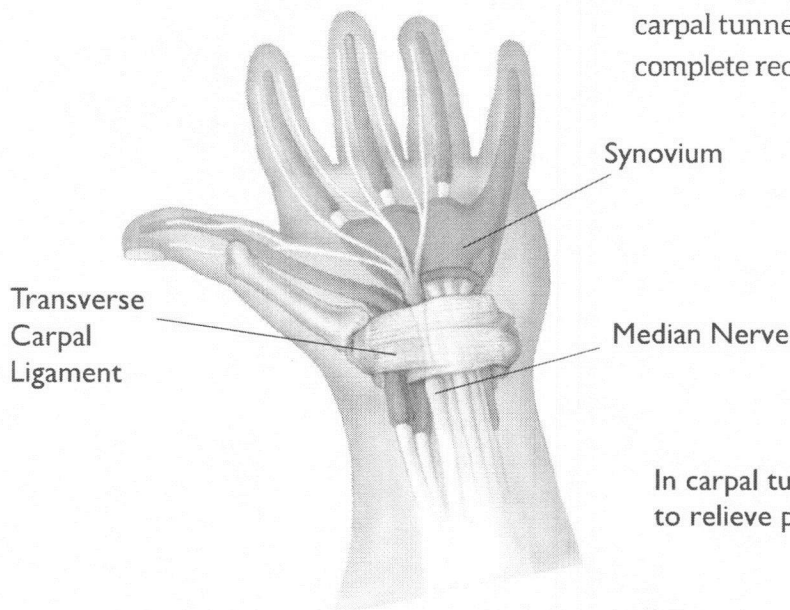
Surgery. In very severe, long-standing cases, surgery may be recommended to prevent irreversible damage. Your doctor may also consider surgery if your symptoms have persisted through nonsurgical treatments.

Procedure. The goal of carpal tunnel syndrome surgery is to make more room for the median nerve and tendons. There are different surgical techniques for doing this, but all involve cutting the transverse carpal ligament to open up the carpal tunnel. When the ligament heals, there will be more room for the nerve and tendons.

Carpal tunnel surgery can be done under general anesthesia where you are put to sleep, or under local anesthesia where you are given medication to numb your arm. Most people are able to go home a few hours after the procedure.

Recovery. You can expect some pain, swelling, and stiffness after surgery. Minor soreness in your palm may last for several months, and a complete recovery may take up to a year.

Most patients' symptoms significantly improve after surgery. People with severe, long-standing carpal tunnel syndrome may not have a complete recovery.



In carpal tunnel surgery, the ligament is cut to relieve pressure on the median nerve.

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For more information

For more information about carpal tunnel syndrome, visit *OrthoInfo* at www.orthoinfo.org.

OrthoInfo is the patient education website of the American Academy of Orthopaedic Surgeons (AAOS), and is a trusted source of information about musculoskeletal conditions. Our articles are developed by orthopaedic surgeons, and provide detailed information about a wide range of injuries and diseases, as well as treatment options and prevention topics.

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Weiss Orthopedics
150 N. Robertson Blvd. Suite 360
Beverly Hills, Ca 90211
(310) 652-1800
www.weissorthopedics.com



Therapeutic Exercise Program for Carpal Tunnel Syndrome

To ensure that this exercise program is safe and effective for you, it should be performed under your doctor's supervision. Talk to your doctor or physical therapist about which exercises will best help you meet your rehabilitation goals.

Carpal tunnel syndrome is a common condition that causes pain, numbness, and tingling in the hand and arm. The condition occurs when one of the major nerves to the hand — the median nerve — is squeezed or compressed as it travels through a narrow passageway in the wrist called the carpal tunnel.

Purpose of Program

A therapeutic exercise program is one treatment option your doctor may recommend. Exercises may help reduce the pressure on the median nerve at the wrist. They may be incorporated with bracing and/or splinting, medication, and activity changes to relieve symptoms.

Some patients may benefit from specific exercises that help the median nerve move more freely within the carpal tunnel. In addition, exercises to help tendons glide through the carpal tunnel can help improve joint range of motion and hand function.

Length of program: This exercise program for carpal tunnel syndrome should be continued for 3 to 4 weeks, unless otherwise specified by your doctor or physical therapist. After your recovery, these exercises can be continued as a maintenance program.

Do not ignore pain: You should not feel significant pain during an exercise. If numbness steadily worsens, if the exercises increase the pain, or if the pain does not improve after you have performed the exercises for 3 to 4 weeks, call your doctor or physical therapist.

Ask questions: If you are not sure how to do an exercise, or how often to do it, contact your doctor or physical therapist.

Additional Notes from Your Clinician

Introduction 1

1. Wrist Extension Stretch

Repetitions

Equipment needed: None

reps, 4x a
day

Additional instructions: This stretch should be done throughout the day, especially before activity. After recovery, this stretch should be included as part of a warm-up to activities that involve gripping.

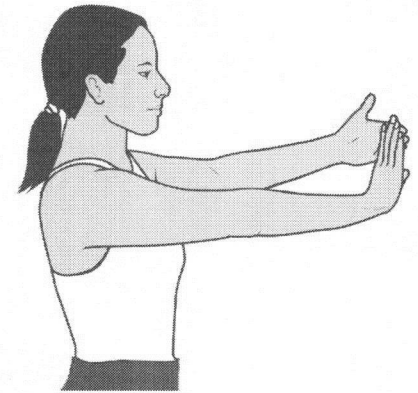


Days per week

Exercise Program for Carpal Tunnel Syndrome STRETCHING EXERCISES

Step-by-step directions

- Straighten your arm and bend your wrist back as if signaling someone to “stop.”
- Use your opposite hand to apply gentle pressure across the palm and pull it toward you until you feel a stretch on the inside of your forearm.
- Hold the stretch for 15 seconds.
- Repeat 5 times, then perform this stretch on the other arm.



Tip Do not lock your elbow.

2. Wrist Flexion Stretch

Repetitions
reps, 4x a
day

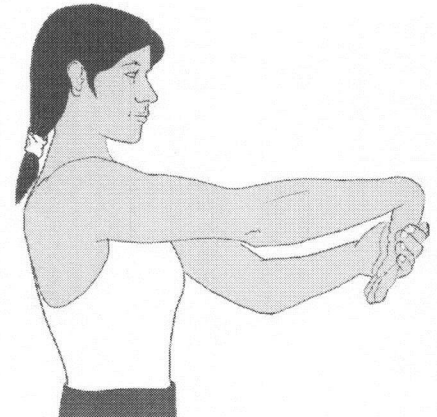
Equipment needed: None

Additional instructions: This stretch should be done throughout the day, especially before activity. After recovery, this stretch should be included as part of a warm-up to activities that involve gripping.

Days per week
to 7

Step-by-step directions

- Straighten your arm with your palm facing down and bend your wrist so that your fingers point down.
- Gently pull your hand toward your body until you feel a stretch on the outside of your forearm.
- Hold the stretch for 15 seconds.
- Repeat 5 times, then perform this stretch on the other arm.



Tip Do not lock your elbow.

Exercises Page 1

3. Medial Nerve Glides

Repetitions
to 15 reps a
day

Equipment needed: None

Additional instructions: Apply heat to your hand for 15 minutes before performing these exercises. After completing the exercises, apply a bag of crushed ice or frozen peas to your hand for 20 minutes to prevent inflammation. Hold each position below for 3 to 7 seconds.



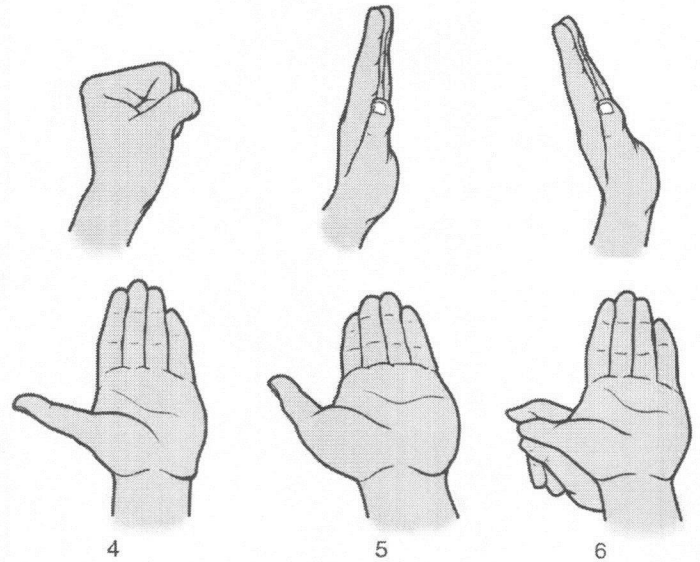
Days per week

to 7

Exercise Program for Carpal Tunnel Syndrome STRETCHING EXERCISES

Step-by-step directions

- Make a fist with your thumb outside your fingers (1)
- Extend your fingers while keeping your thumb close to the side of your hand (2)
- Keep your fingers straight and extend your wrist (bend your hand backward toward your forearm) (3)
- Keep your fingers and wrist in position and extend your thumb (4)
- Keep your fingers, wrist, and thumb extended and turn your forearm palm up (5)
- Keep your fingers, wrist, and thumb extended and use your other hand to gently stretch the thumb (6)



Tip Do not put too much pressure on your thumb in position 6.

Exercises Page 2

4. Tendon Glides

Repetitions

- 10 reps,
to 3x a day

Equipment needed: None

Additional instructions: Apply heat to your hand for 15 minutes before performing these exercises. After completing the exercises, apply a bag of crushed ice or frozen peas to your hand for 20 minutes to prevent inflammation.

Days per week

Progress as
tolerated

Two series of tendon gliding exercises are provided here. Follow these general instructions for both series:

- Proceed from position 1 through 3 in sequence
- Hold each position for 3 seconds
- As the exercises become easier to complete, increase the number of repetitions, or how many times per day you do them

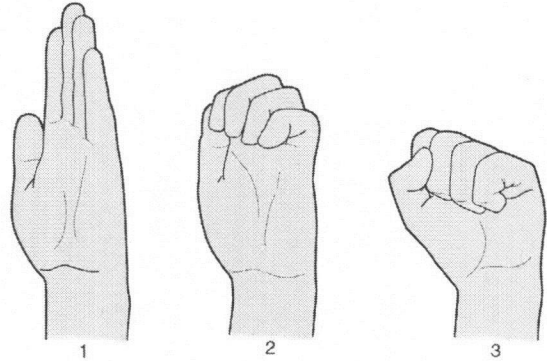


Exercise Program for Carpal Tunnel Syndrome STRETCHING EXERCISES

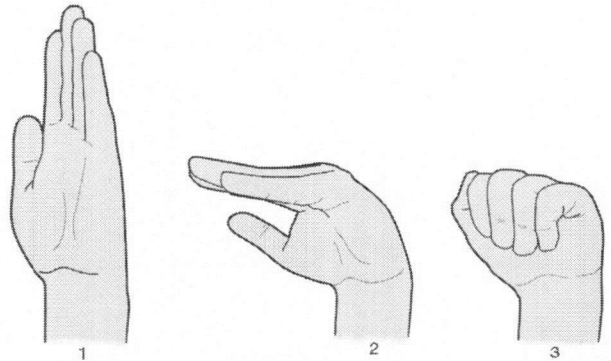
Step-by-step directions for Series A

Series A

- With your hand in front of you and your wrist straight, fully straighten all of your fingers (1)
- Bend the tips of your fingers into the “hook” position with your knuckles pointing up (2)
- Make a tight fist with your thumb over your fingers (3)



Step-by-step directions for Series B



Series

B • With your hand in front of you and your wrist straight, fully straighten all of your fingers (1)

- Make a “tabletop” with your fingers by bending at your bottom knuckle and keeping the fingers straight (2)
- Bend your fingers at the middle joint, touching your fingers to your palm (3)

Tip

These movements may cause a gentle pulling, but should not cause increased pain.