

# Carpal tunnel syndrome



## Carpal tunnel syndrome

By Mayo Clinic staff

Although it might seem that carpal tunnel syndrome is a condition born from long hours spent working on a computer keyboard, carpal tunnel syndrome actually has numerous causes.

Bound by bones and ligaments, the carpal tunnel is a narrow passageway — about as big around as your thumb — located on the palm side of your wrist. This tunnel protects a main nerve to your hand and nine tendons that bend your fingers. Pressure placed on the nerve produces the numbness, pain and, eventually, hand weakness that characterize carpal tunnel syndrome.

Fortunately, for most people who develop carpal tunnel syndrome, proper treatment usually can relieve the pain and numbness and restore normal use of their wrists and hands.

### Symptoms

Carpal tunnel syndrome typically starts gradually with a vague aching in your wrist that can extend to your hand or forearm. Other common carpal tunnel syndrome symptoms include:

- **Tingling or numbness** in your fingers or hand, especially your thumb and index, middle or ring fingers, but not your little finger. This sensation often occurs while holding a steering wheel, phone or newspaper or upon awakening. Many people "shake out" their hands to try to relieve their symptoms. As the disorder progresses, the numb feeling may become constant.
- **Pain radiating or extending** from your wrist up your arm to your shoulder or down into your palm or fingers, especially after forceful or repetitive use. This usually occurs on the palm side of your forearm.
- **A sense of weakness** in your hands and a tendency to drop objects.

### When to see a doctor

If you have persistent signs and symptoms that might be due to carpal tunnel syndrome that interfere with your normal activities — including sleep — see your doctor. If you leave the condition untreated, nerve and muscle damage can occur.

### Causes

The cause of carpal tunnel syndrome is pressure on the median nerve. The median nerve is a mixed nerve, meaning it has a sensory function and also provides nerve signals to move your muscles (motor function). The median nerve provides sensation to your thumb, index finger, middle finger and the middle-finger side of the ring finger.

Pressure on the nerve can stem from anything that reduces the space for it in the carpal tunnel. Possible causes include:

- **Other health conditions.** Some examples include rheumatoid arthritis, certain hormonal disorders — such as diabetes, thyroid disorders and menopause — fluid retention due to pregnancy, or deposits of amyloid, an abnormal protein produced by cells in your bone marrow.

- **Repetitive use or injury.** Repetitive flexing and extending of the tendons in the hands and wrists, particularly when done forcefully and for prolonged periods without rest, also can increase pressure within the carpal tunnel. Injury to your wrist can cause swelling that exerts pressure on the median nerve.
- **Physical characteristics.** It may be that your carpal tunnel is more narrow than average.

## Risk factors

Some research suggests that carpal tunnel syndrome can result from overuse or strain in certain job tasks that require a combination of repetitive, forceful, and awkward or stressed motions of your hands and wrists. Examples of these include using power tools — such as chippers, grinders, chain saws or jackhammers — and heavy assembly line work, such as occurs in a meatpacking plant. Although repetitive computer use is commonly assumed to cause carpal tunnel syndrome, the scientific evidence for this association isn't definitive.

Although it's not clear which activities can cause carpal tunnel syndrome, if your work or hobbies are hand-intensive — involving a combination of awkward, repetitive wrist or finger motions, forceful pinching or gripping, and working with vibrating tools — you may be at higher risk of developing the condition.

Other risk factors include:

- **Your sex.** Women are three times as likely as men are to develop carpal tunnel syndrome, according to the National Institute of Neurological Disorders and Stroke.
- **Heredity.** You may be significantly more likely to develop carpal tunnel syndrome if close relatives have had the condition. Inherited physical characteristics, such as the shape of your wrist, may make you more susceptible.
- **Certain health conditions.** Conditions including some thyroid problems, diabetes, obesity and rheumatoid arthritis can increase your risk. People with end-stage kidney disease also are more likely to develop carpal tunnel syndrome. Women who are pregnant, taking oral contraceptives or going through menopause also are at increased risk, most likely due to hormonal changes. Fluid retention may be a cause of carpal tunnel syndrome during pregnancy. Fortunately, carpal tunnel syndrome related to pregnancy almost always improves after childbirth.

## Tests and diagnosis

Your doctor will likely want to review your signs and symptoms to find out where they're located. One diagnostic key is that the median nerve doesn't provide sensation to the little finger, so symptoms in that finger may indicate a different problem. Another clue is the timing of the symptoms. Typical times when you might experience symptoms due to carpal tunnel syndrome include while holding a phone or a newspaper, gripping a steering wheel, or waking up during the night.

Your doctor will also want to test the feeling in your fingers and the strength of the muscles in your hand, because these can be affected by carpal tunnel syndrome. Pressure on the median nerve at the wrist, produced by either bending the wrist, tapping on the nerve or simply pressing on the nerve, can bring on the symptoms in many people.

If you have signs and symptoms of carpal tunnel syndrome, your doctor may recommend the following diagnostic tests:

- **Electromyogram.** Electromyography measures the tiny electrical discharges produced in muscles. A thin-needle electrode is inserted into the muscles your doctor wants to study. An instrument records the electrical activity in your muscle at rest and as you contract the muscle. This test can help determine if muscle damage has occurred.
- **Nerve conduction study.** In a variation of electromyography, two electrodes are taped to your skin. A small shock is passed through the median nerve to see if electrical impulses are slowed in the carpal tunnel.

These tests are also useful in checking for other conditions that might mimic carpal tunnel syndrome, such as a pinched nerve in your neck. Imaging tests, such as MRI or X-ray, generally aren't used to diagnose carpal tunnel syndrome.

Your doctor may recommend that you see a rheumatologist, neurologist, hand surgeon or neurosurgeon if your signs or symptoms indicate other medical disorders or a need for specialized treatment.

## Treatments and drugs



Carpal tunnel release

Some people with mild symptoms of carpal tunnel syndrome can ease their discomfort by taking more-frequent breaks to rest their hands and applying cold packs to reduce occasional swelling. If these techniques don't offer relief, carpal tunnel syndrome treatment options include wrist splinting, medications and surgery.

### Nonsurgical therapy

Most people with carpal tunnel syndrome experience effective treatment with nonsurgical methods, including:

- **Wrist splinting.** A splint that holds your wrist still while you sleep can help relieve nighttime symptoms of tingling and numbness. Splinting and other conservative treatments are more likely to help you if you've had only mild to moderate symptoms for less than 10 months.
- **Nonsteroidal anti-inflammatory drugs (NSAIDs).** NSAIDs may help relieve pain from carpal tunnel syndrome if you have an associated inflammatory condition.
- **Corticosteroids.** Your doctor may inject your carpal tunnel with a corticosteroid, such as cortisone, to relieve your pain. Corticosteroids decrease inflammation, which relieves pressure on the median nerve. Oral corticosteroids aren't as effective as corticosteroid injections for treating carpal tunnel syndrome.

If carpal tunnel syndrome results from an inflammatory arthritis, such as rheumatoid arthritis, then treating the underlying condition generally also reduces the carpal tunnel syndrome symptoms.

### Surgery

Generally, nonsurgical treatments may be more effective if you have only mild nerve impairment. When the pain or numbness of carpal tunnel syndrome persists more than six months, surgery may be the best option.

Your surgeon may use one of a few accepted techniques. But in all accepted surgical procedures, your doctor cuts the ligament pressing on your nerve. At times, surgery can be done using an endoscope, a telescope-like device with a tiny camera attached to it that allows your doctor to see inside your carpal tunnel and perform the surgery through small incisions in your hand or wrist. In other cases, surgery involves making a larger incision in the palm of your hand over the carpal tunnel and releasing the nerve.

Surgery usually results in marked improvement, but you may experience some residual numbness, pain, stiffness or weakness. Surveys of people who have undergone carpal tunnel release indicate that about 70 percent are completely or very satisfied with the outcome of their surgery. Some variables that are associated with lower levels of satisfaction include drinking more than two alcoholic drinks a day, smoking, lower mental and physical health status before surgery, and exposure to repetitive, forceful activity.

Soreness or weakness may take from several weeks to as long as a few months to resolve. If surgery appears to be the best alternative for relieving your symptoms or preventing further muscle degeneration, be sure to talk with your surgeon about the procedure that will work best for you and with your plans to return to your previous activity levels, both at work and at home.

### Lifestyle and home remedies

Quick breaks, stretching, aspirin or other over-the-counter NSAIDs — such as ibuprofen (Advil, Motrin, others) and naproxen (Aleve, others) — may relieve your symptoms temporarily.

You might also want to try wearing a wrist splint at night and avoid sleeping on your hands to help ease the pain or numbness in your wrists and hands. The splint should be snug but not tight. If pain, numbness or weakness recurs and persists, see your doctor.

## Alternative medicine

Yoga and other relaxation techniques may help with chronic pain that occurs with some muscle and joint conditions. Yoga postures designed for strengthening, stretching and balancing each joint in the upper body, as well as the upper body itself, may help reduce the pain and improve the grip strength of people with carpal tunnel syndrome.

Although some people use acupuncture or chiropractic therapy to treat carpal tunnel syndrome, these techniques haven't been proved in clinical trials. Supplements of vitamin B-6 may be helpful for relieving the symptoms of carpal tunnel syndrome. Ultrasound treatments also may be used, but have had variable results in studies. Electrical stimulation, magnet therapy and laser treatments haven't provided the same benefits in controlled trials.

You may have to experiment to find a treatment that works for you. Still, always check with your doctor before trying any complementary or alternative treatment.

## Coping and support

If you experience chronic pain or can't use your hands as before, you may become depressed or experience low self-esteem. In addition, if your hand symptoms are caused or worsened by your current profession or leisure activities, you may face the tough decision of switching careers or giving up hobbies. You may also feel that you aren't actively contributing to your family if you can't drive a car or perform ordinary household tasks.

Support groups for people with carpal tunnel syndrome can help you find out more information about your condition plus offer advice and solace from those who've lived with carpal tunnel syndrome. Stress management and relaxation techniques also may help you deal with the psychological and emotional issues that may accompany carpal tunnel syndrome.

## Prevention

There are no proven strategies to prevent carpal tunnel syndrome, but to protect your hands from a variety of ailments, take the following precautions:

- **Reduce your force and relax your grip.** Most people use more force than needed to perform many tasks involving their hands. If your work involves a cash register, for instance, hit the keys softly. For prolonged handwriting, use a big pen with an oversized, soft grip adapter and free-flowing ink. This way you won't have to grip the pen tightly or press as hard on the paper.
- **Take frequent breaks.** Give your hands and wrists a break by gently stretching and bending them periodically. Alternate tasks when possible. If you use equipment that vibrates or that requires you to exert a great amount of force, taking breaks is even more important.
- **Watch your form.** Avoid bending your wrist all the way up or down. A relaxed middle position is best. If you use a keyboard, keep it at elbow height or slightly lower.
- **Improve your posture.** Incorrect posture can cause your shoulders to roll forward. When your shoulders are in this position, your neck and shoulder muscles are shortened, compressing nerves in your neck. This can affect your wrists, fingers and hands.
- **Keep your hands warm.** You're more likely to develop hand pain and stiffness if you work in a cold environment. If you can't control the temperature at work, put on fingerless gloves that keep your hands and wrists warm.



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