

Patient information: Carpal Tunnel Syndrome

Carpal tunnel syndrome (CTS) is a common problem affecting the hand and wrist. Symptoms begin when the *median nerve* gets squeezed inside the carpal tunnel of the wrist. Any condition that decreases the size of the carpal tunnel or enlarges the tissues inside the tunnel can produce the symptoms of CTS.

The *carpal tunnel* is an opening through the wrist to the hand that is formed by the bones of the wrist on one side and the *transverse carpal ligament* on the other. (Ligaments connect bones together.) This opening forms the carpal tunnel. The *median nerve* passes through the carpal tunnel into the hand. It gives sensation to the thumb, index finger, long finger, and half of the ring finger. It also sends a nerve branch to control the *muscles* of the thumb.

What does CTS feel like?

One of the first symptoms of CTS is gradual tingling and numbness in the areas supplied by the median nerve. This is typically followed by dull, vague pain where the nerve gives sensation in the hand. The hand may begin to feel like it's asleep, especially in the early morning hours after a night's rest.

In the case of acute CTS, symptoms are sudden and severe, occurring over a matter of hours rather than weeks or months with the more chronic form of this condition.

How do doctors identify the condition?

Your doctor begins the evaluation by obtaining a history of the problem, followed by a thorough physical examination. Your description of the symptoms and the physical examination are the most important parts in the diagnosis of CTS. Commonly, patients will complain first of waking in the middle of the night with pain and a feeling that the whole hand is asleep.

If more information is needed to make the diagnosis, electrical studies of the nerves in the wrist may be requested by your doctor. Several tests are available to see how well the median nerve is functioning, including the *nerve conduction velocity* (NCV) test. This test measures how fast nerve impulses move through the nerve.

Treatment

What can be done for CTS?

Nonsurgical Treatment

Activities that are causing your symptoms need to be changed or stopped if at all possible. Avoid heavy grasping, holding onto vibrating tools, and positioning or working with your wrist bent down and out. If you smoke, talk to your doctor about ways to help you quit. Lose weight if you are overweight.

A wrist brace will sometimes decrease the symptoms in the early stages of CTS. A brace keeps the wrist in a resting position, not bent back or bent down too far. A brace can be especially helpful for easing the numbness and pain felt at night because it can keep your hand from curling under as you sleep.

If these simple measures fail to control your symptoms, an injection of cortisone into the carpal tunnel may be suggested. This medication is used to reduce the swelling in the tunnel and may give temporary relief of symptoms. A cortisone injection may help ease symptoms and can aid your doctor in making a diagnosis. If you don't get even temporary relief from the injection, it could indicate that some other problem is causing your symptoms

Surgery

If all attempts to control your symptoms fail, surgery may be suggested to reduce the pressure on the median nerve. Surgery may not be advised if there is advanced nerve damage. Persistent pain and numbness may not go away with surgery. If you have muscle atrophy and weakness and/or loss of sensation, you may not be a good candidate for surgery.

Surgery may not be advised if electrodiagnostic studies show normal results. In such cases, patients seeking pain relief will be advised to continue with conservative (nonoperative) care.

In the case of acute CTS, surgery is required right away to decompress the nerve and save it from permanent damage. By releasing the pressure on the nerve, the blood supply to the nerve improves, and most people get relief of their symptoms. However, if the nerve pressure has been going on a long time, the median nerve may have thickened and scarred to the point that recovery after surgery is much slower.

The standard surgery for CTS is called *open release*. *Open* surgical procedures use a small skin incision. In open release for CTS, an incision as small as one inch can be made down the front of the wrist and palm. The surgeon cuts the transverse carpal ligament in order to take pressure off the median nerve. After dividing the transverse carpal ligament, the surgeon stitches just the skin together and leaves the loose ends of the transverse carpal ligament separated. The loose ends are left apart to keep pressure off the median nerve. Eventually, the gap between the two ends of the ligament fills in with scar tissue.

What should I expect after treatment?

Nonsurgical Rehabilitation

If nonsurgical treatment is successful, you may see improvement in four to six weeks. You may need to continue wearing your wrist splint at night to control symptoms and keep your wrist from curling under as you sleep. Try to do your activities using healthy body and wrist alignment. Limit activities that require repeated motions, heavy grasping, and vibration in the hand.

After Surgery

Pain and symptoms usually begin to improve, but you may have tenderness in the area of the incision for several months after surgery. Apart from this less common risks are infection, slow wound healing, damage to nerves or blood vessels in the area of the operation which can sometimes cause numbness in the thumb, and a recurrence of the problem despite an adequate decompression.

Recovery may take longer than expected when nerve damage is severe. In some cases, symptoms are not entirely alleviated.

When the stitches are removed, your surgeon will have you work with a physical or occupational therapist for six to eight weeks. Treatments are used at first to ease pain and inflammation. Gentle massage to the incision can help reduce sensitivity in and around the incision and limit scar tissue from building up. Special exercises are used to encourage normal gliding of the tendons and median nerve within the carpal tunnel.