

Carpal tunnel syndrome is a common condition with numbness in hands. However, it is not the only cause of hand numbness. Other potential causes are listed below.

Causes

Compression Neuropathy

Compression neuropathy is pressure on a nerve anywhere along its course (Figure 1). In addition to numbness, compression neuropathy can cause weak or twitchy muscles. The pressure may come from many sources. It can occur after an injury due to bleeding or swelling. A displaced or angled fracture can stretch the nerve. Sometimes tendon lining thickens in an enclosed space, and nerve pressure rises. Fascia is a structure below the fat layer that covers muscles and tendons. Sometimes a thickened edge of fascia or tendon can compress a nerve. An abnormally located muscle can also cause pressure. Soft tissue masses or ganglion cysts can result in nerve compression. Types of nerve compression include:

Ulnar nerve compression at the wrist (Guyon Syndrome)

This causes numbness and tingling typically on the pinky finger side of the hand. The back side of the hand is usually normal. Severe cases can have hand and grip weakness. The weakness is most noticeable when attempting to separate the fingers. The ability to bend the ring and small fingertips remains.

Ulnar nerve compression at the elbow (Cubital Tunnel Syndrome)

This condition typically has the same symptoms as Guyon Syndrome but also numbness on the back of the hand on the pinky side. There can also be pain at the inside portion of the elbow. Severe cases can have hand and grip weakness. The weakness occurs when attempting to separate the fingers, when trying to bend the ring and small fingertips, and when trying to bend the wrist.

Radial nerve compression in the forearm or wrist

The radial nerve could be compressed in either side of the forearm. Proximal compression of the motor branch, called the posterior interosseous nerve, is called radial tunnel syndrome. This condition can cause achiness or vague pain in the backside of the forearm. It may be worsened when straightening the wrist or finger. It can be challenging to diagnose, as nerve conduction studies and imaging may be normal.

When the radial nerve branch is compressed, it typically is a sensory only problem. This nerve can be injured from cuts, placement of an IV for medication or fluids, hand-cuffs, or during surgeries on the radial bone.

Median nerve compression at the wrist (Carpal Tunnel Syndrome)

This causes numbness and tingling in the thumb, index, and middle fingers. Other fingers and even the whole hand can sometimes feel numb. However, when specifically tested, the small finger should have normal feeling.

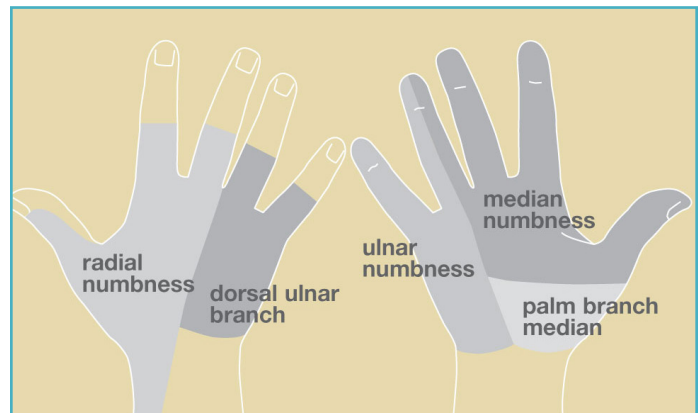


Figure 1: Compression on a nerve can cause numbness in hands. This image shows the nerves that supply sensation to the hand.

Severe cases can result in weakness to the thumb lifting away from the hand. Finger bending strength is typically normal. Symptoms are often worse at night. They may also develop from the wrist being bent in a position for a long time.

Median nerve compression at the elbow

The numbness in this condition is similar to carpal tunnel syndrome in the fingers. There is additional numbness in the palm near the thumb that is not present in carpal tunnel. Sometimes there is weakness when bending the index and middle finger and weakness when bending the tip of the thumb.

Pressure on nerves in the neck (Figures 2-3)

This can be caused by arthritis, diseases, infections, tumors, blood vessel abnormalities and other conditions of the spinal cord. In addition to numbness, symptoms include weak muscles and decreased reflexes in the arm and forearm (sometimes even the legs). Pressure on nerves at the neck is more common to have radiating arm pain as part of the symptoms. Sometimes, a nerve may suffer from pressure at more than one area. This is called "double crush." Pressure on a nerve may require surgery to get relief.

Peripheral Neuropathy

In peripheral neuropathy, the very ends of the nerves in the hands and feet are affected. With this condition, there may or may not be pain, and the numbness is often constant. Diabetes, alcoholism, and old age are common known causes of neuropathy. Poisoning from metals and industrial compounds are also possible causes. It typically shows a "stocking-glove" pattern in which the numbness moves up from the toes to the legs. At the time the numbness progresses to the mid-calf, then the fingers and hands become involved. It can happen on both sides of the body and often affects all nerves to the feet or hand in a similar amount.

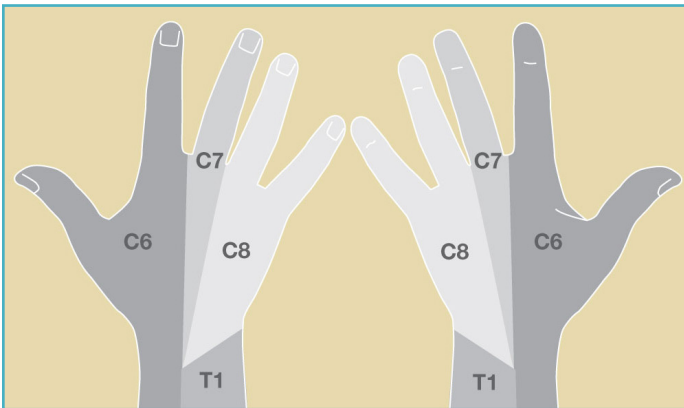


Figure 2: The nerves in the neck travel down the arms to connect to the muscles and skin in the arms and hands. Pressure on these nerves can cause numbness in hands. This image shows the names of the spinal nerves and how they distribute to the hands.

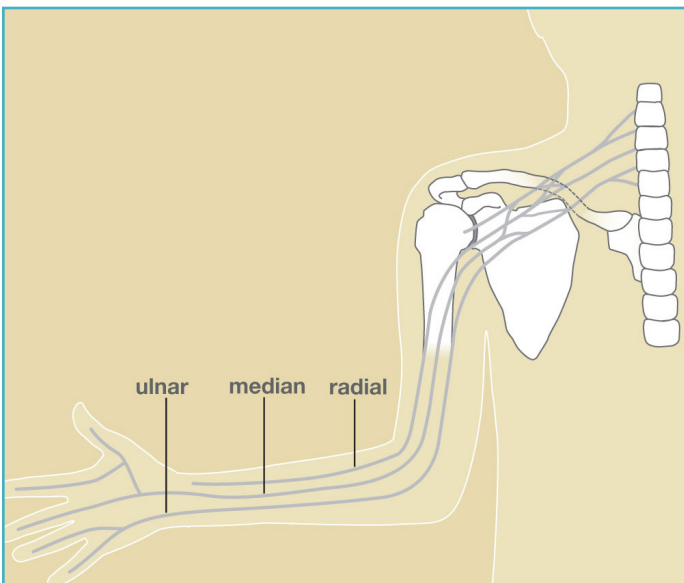


Figure 3: Nerve pathways from the spine to the fingers. Nerves can be compressed anywhere from the neck down.

Fibromyalgia

Millions of Americans suffer from this condition, which can last for years or indefinitely. People with fibromyalgia have been shown to be more likely than others to develop carpal tunnel syndrome and may seek surgical treatment to release pressure in the carpal tunnel. People with this condition have persistent pain, frequently in many areas throughout the body, as well as fatigue, headaches, bowel problems, depression, sleep problems and other generalized symptoms.

Myofascial Pain Syndrome

This is another condition known to cause numbness in hands. It has some symptoms similar to fibromyalgia, specifically numb hands and numb forearms, often with aches and pain. Although the symptoms may be felt in the hands, the muscles causing the problems are usually those in the neck and shoulder region. The symptoms are usually stiffness and may be associated with frequent headaches. There is no hand surgery to correct or improve symptoms with this condition.

Medications

Certain medications, such as cancer treatment drugs, are known to cause tingling and numbness in hands. Some of these cause temporary numbness that goes away after completion of the chemotherapy treatment. Others may cause permanent numbness.

Other Causes

Other causes of numbness in hands may include:

- Nutritional deficiencies, such as vitamin B1, B6, or B12 deficiency
- Multiple sclerosis
- Stroke
- Disorders of the brain and spinal cord

Diagnosis

The pattern of symptoms can help determine if the cause is pressure on a nerve, a disease, medications, or another condition. For many of these disorders, a thorough history and physical exam are most important to narrow down or make a diagnosis. Further tests such as an x-ray, an MRI, nerve tests (such as EMG), ultrasound, blood tests, or a spinal tap may be used to help confirm a diagnosis.

Treatment

Specific treatment recommendations can be made by your hand surgeon once you are diagnosed. You may also be referred to other specialists such as a neurologist, rheumatologist, pain management specialist, or other health care provider. When there is weakness or stiffness, hand therapy may be helpful. Your hand therapist will show you some strengthening exercises that can be helpful. Wrist or elbow braces can often improve positional numbness. Some of the compression neuropathies can be treated with steroid injections (also known as a cortisone shot).

When other non-operative treatments have failed, surgical decompression can be considered. Symptom improvement is dependent on time of pressure, severity of pressure, and other patient factors. Some problems can be fully treated. Other times, not all numbness or weakness will go away with treatment. Nerve injury can sometimes be permanent. If medical treatment at least stops the problem from getting worse, that can be considered a good benefit. To reduce the chances of permanent numbness, tingling, or weakness, find a hand surgeon to evaluate you early after symptoms start.