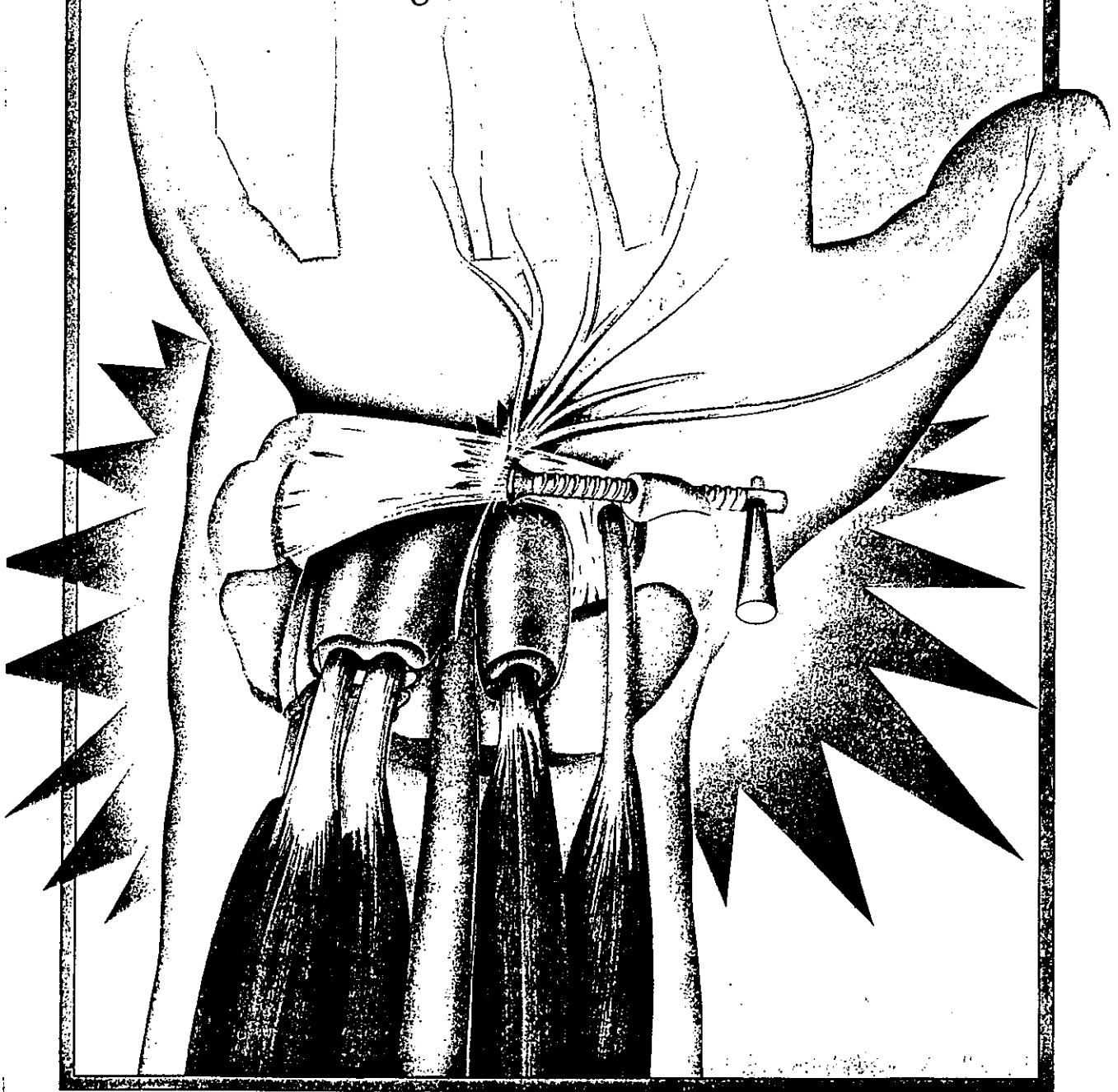


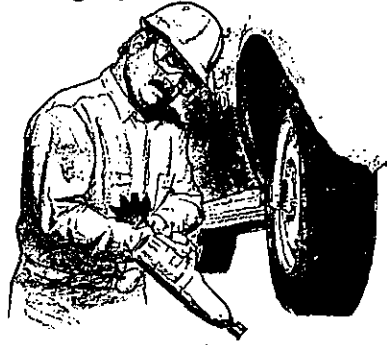
CARPAL TUNNEL SYNDROME

Relieving the Pressure in Your Wrist



UNDERSTANDING CARPAL TUNNEL SYNDROME

Carpal tunnel syndrome (CTS) is a common and troublesome condition that interferes with the use of the hand. It is caused when too much pressure is put on a nerve that runs through your wrist. A variety of anatomical abnormalities may be responsible for this vise-like pressure. Once symptoms of pain and tingling appear, the condition frequently worsens and permanent nerve damage may occur. However, CTS is highly treatable if diagnosed early.



Progressive Pain and Numbness

The pain, numbness, and tingling of CTS can happen anywhere and anytime, at home or at work. But most often symptoms begin by waking you up at night. Shaking or massaging the hand may work temporarily, but if ignored, CTS gets progressively worse. The pain increases, the grip weakens, and you may begin dropping things. Fortunately, appropriate treatment is available.

Take Action Early

It's always best to prevent a condition, and CTS is no exception. But if you do notice symptoms, don't wait for them to become unbearable. The earlier you have a professional diagnosis and treatment, the more successful the outcome will be.



Prevention

At home or on the job, there are steps you can take that may help decrease the risk of developing or worsening the symptoms of CTS.

Early Diagnosis

Early diagnosis of CTS means you get relief sooner. It also minimizes the possibility of permanent nerve damage, discomfort, and disability.

Treatment Options

Treatment usually begins with a splint, medication, or both. If symptoms don't subside, your physician may recommend surgery.

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THE CARPAL TUNNEL

In order to understand CTS, it helps if you understand the anatomy of the carpal (meaning "wrist") tunnel. Conditions in many parts of the body can cause symptoms in the hands and fingers. In CTS, the symptoms occur because a major nerve is compressed as it passes through a narrow tunnel of bone and ligament at the wrist. The result is numbness, tingling, "pins and needles," burning, and pain in the middle and index finger and thumb, and sometimes in all five fingers.

Normal Carpal Tunnel Anatomy

The Carpal Tunnel

In the center of the wrist, bones and a ligament form a narrow tunnel containing tendons and a major nerve.

Carpal Bones

A U-shaped cluster of eight bones at the base of the palm forms the hard, rigid floor and the two sides of the tunnel.

Transverse Carpal Ligament

A very strong ligament, tough as bone, lies across the arch of carpal bones, forming the roof of the tunnel.

Flexor Tendons

The fine tendons have a lubricating lining (synovium). This allows the tendons to slide back and forth through the tunnel as the wrist flexes and unflexes and the fingers are used.

Median Nerve

This nerve conducts sensation from part of the hand, up the arm, to the central nervous system. The nerve is the softest component of the tunnel; when it is compressed at the wrist, the hand and fingers are affected.

Causes of Carpal Tunnel Syndrome

Various conditions cause wrist structures to take up extra space in the carpal tunnel. Since bones and ligament have no "give," this puts pressure on the nerve, resulting in symptoms.

Wear and Tear

The synovium around the tendons may become thick and sticky due to the normal wear and tear of the aging process or repetitive hand movements, thus pressing the nerve against the tunnel.



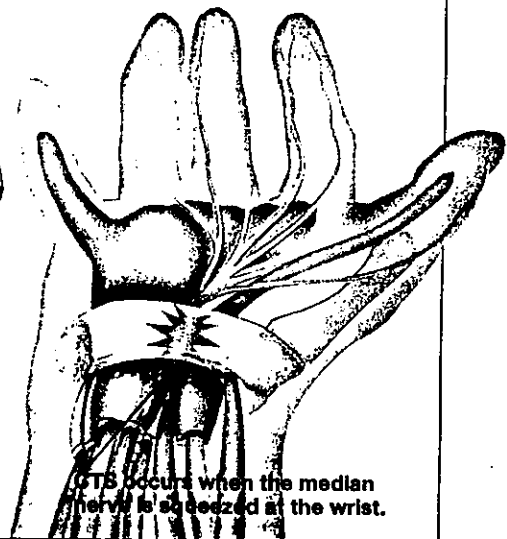
Bone Dislocation and Fracture

Previous dislocation or fracture of the wrist causes bone to protrude into the tunnel. Arthritis may also be present. Consequently, the tunnel becomes too narrow and puts pressure on the nerve.



Fluid Retention

Edema (fluid retention) causes swelling of tissue in the carpal tunnel, including perhaps the nerve itself. This occurs most often during pregnancy, with the symptoms subsiding after delivery.



CTS occurs when the median nerve is squeezed at the wrist.

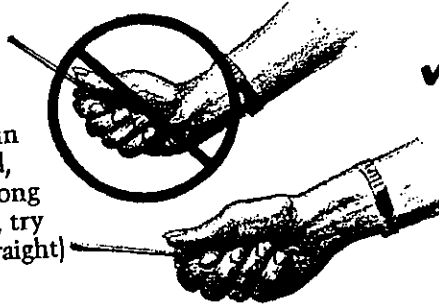
GTS PREVENTION AT HOME AND AT WORK

Certain repetitive hand activities may put you at higher risk for developing a variety of wrist problems such as carpal tunnel syndrome. By learning how to modify the way you use your hands, you may be able to reduce the risk. Whenever possible, keep the following pointers in mind at home and on the job, and be sure to follow your company's hand and wrist safety policies and procedures.



✓ Keep Your Wrist in Neutral

Avoid using your wrist in a bent (flexed), extended, or twisted position for long periods of time. Instead, try to maintain a neutral (straight) wrist position.



✓ Watch Your Grip

Gripping, grasping, or lifting with the thumb and index finger can put stress on your wrist. When practical, use the whole hand and all the fingers to grasp an object.

✓ Minimize Repetition

Even simple, light tasks may eventually cause injury. If possible, avoid repetitive movements or holding an object in the same way for extended periods of time.

✓ Rest Your Hands

Periodically give your hands a break by letting them rest briefly. Or you may be able to alternate easy and hard tasks, switch hands, or rotate work activities.

✓ Reduce Speed and Force

Reducing the speed with which you do a forceful, repetitive movement gives your wrist time to recover from the effort. Using power tools helps reduce the force.

✓ Conditioning Exercises

Certain exercises strengthen the hand and arm muscles. They may help by reducing the need to compensate for these weak muscles with a poor wrist position.

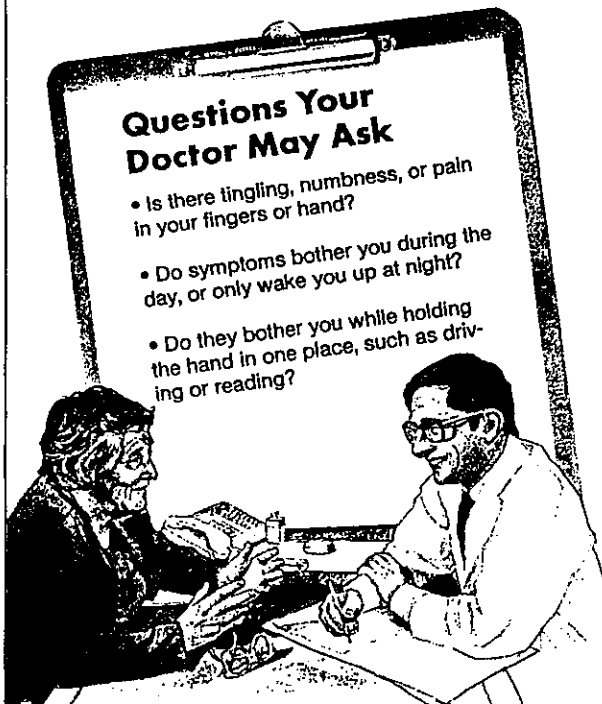
Note: These general recommendations are not designed to take the place of your company's policies. See your supervisor if you have any questions.

EARLY DIAGNOSIS: YOUR MEDICAL EVALUATION

Accurate diagnosis is important because treatment for this condition is specific for CTS. The sooner you have a professional evaluation, the sooner your symptoms can be relieved, and the more likely it is that permanent nerve or muscle damage will be prevented. For your evaluation, your doctor will take a medical history followed by a physical exam; you may also require certain tests.

Medical History

Your doctor will ask you to describe your symptoms, which may feel like tingling, numbness, pins and needles, pain, or a heaviness in the hands and fingers. Your doctor will need to know if symptoms are mild and intermittent or severe and frequent, and whether they bother you only at night, or during the day, or both.



Physical Examination

The physical exam helps confirm that symptoms are related to a nerve problem, and then to localize the nerve problem to the wrist. Your doctor will examine your wrist for swelling and signs of previous injury. You may be tested for decreased sensitivity to touch or to pin pricks. Other simple nerve tests include:

Tinel's Test

Your doctor gently taps over the nerve with his or her fingers.



Phalen's Test

Your wrist is held in a flexed position for a period of time.



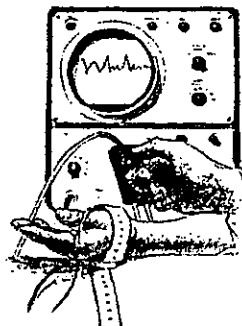
Tests

After the history and exam, your doctor may order additional tests to confirm and document the diagnosis of CTS if surgery is being considered. These include standard wrist or carpal tunnel x-rays; a nerve conduction test and an electromyogram are an objective means of making a definitive diagnosis.



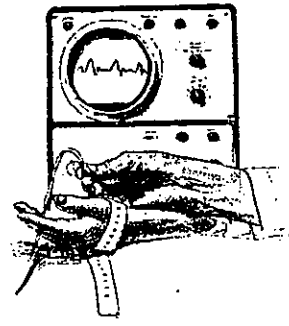
X-rays

Help rule out other conditions such as fracture or arthritis.



Nerve Conduction

Electrodes measure the speed of electricity along the nerve.



Electromyogram

Electrodes placed in the muscle reveal any abnormalities.

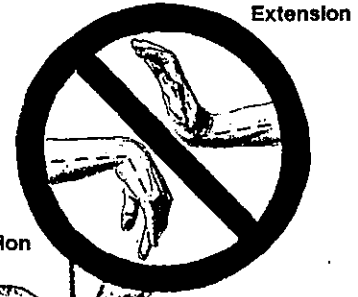
TREATMENT OPTIONS

MEDICAL

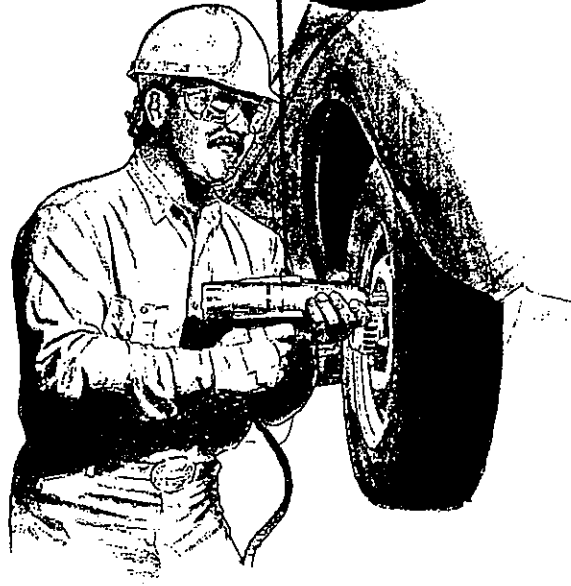
Treatment of carpal tunnel syndrome usually begins with a wrist splint, medications, or a combination of the two. These simple, nonsurgical treatments help at least temporarily in many cases, especially if symptoms are mild. Splints and medications may also function as an interim treatment—they provide some measure of relief if you are going to have surgery.

Splints

Flexing the wrist downward or extending it up worsens CTS symptoms because this narrows the tunnel and puts more pressure on the nerve. Both **night splints** and **occupational splints** are designed to keep the wrist in a less extreme, or "neutral," position. This may reduce the pressure in the tunnel and relieve or prevent worsening of symptoms.



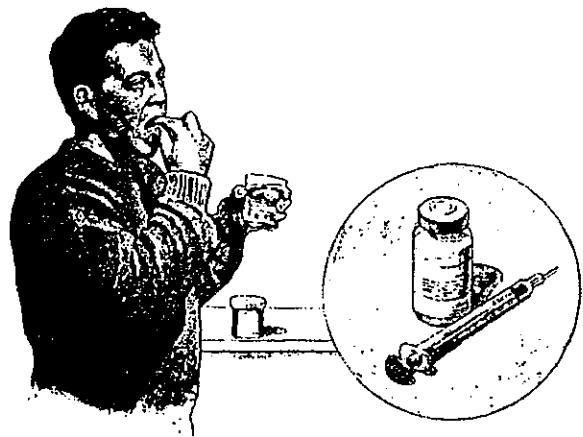
Night splints keep your wrist in a neutral position while you sleep, so symptoms don't wake you at night; they may also help reduce daytime symptoms.



Occupational splints are job specific. Of the many designs available, each protects your wrist and keeps it in a more neutral position while you work.

Medications

Medications are used to reduce swelling and inflammation, and therefore ease pressure on the median nerve. **Non-steroidal anti-inflammatory drugs** are taken orally as directed by your doctor. Or a **steroid drug** may be injected directly into the carpal tunnel. A single injection may bring relief for months, or it may need to be repeated. (If the injections provide relief, this generally confirms a diagnosis of CTS.) In some cases, diuretics (water pills) or pyridoxine (vitamin B-6) may help.

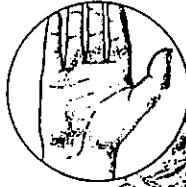


SURGICAL

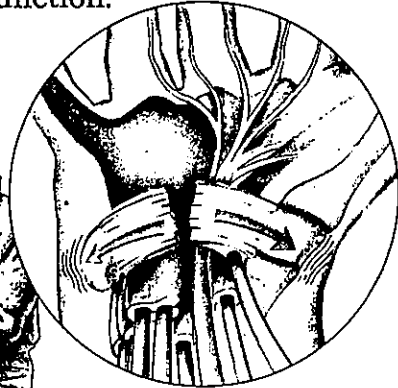
Surgery may be recommended if you have severe pain, if you have other symptoms that persist in spite of nonsurgical treatment, or if you are at risk of developing permanent nerve damage. Your doctor will explain the procedure, its risks and complications, and give you pre-op and post-op instructions, which may include rehabilitation exercises to restore hand function.

The Procedure

The surgical procedure is called **carpal tunnel release**. It takes 45 minutes to one hour, and is usually done as same day surgery. While a tourniquet is on your arm, the transverse ligament is divided to open up the carpal tunnel and relieve the pressure on the nerve; thickened synovial tissue may also be removed.



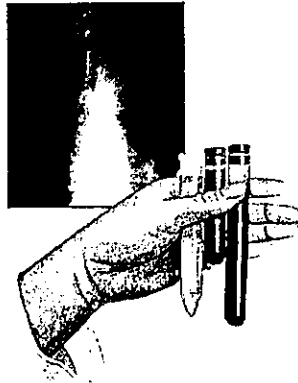
Typical incision site



Surgery releases the ligament, and the tunnel springs open, easing pressure on the nerve.

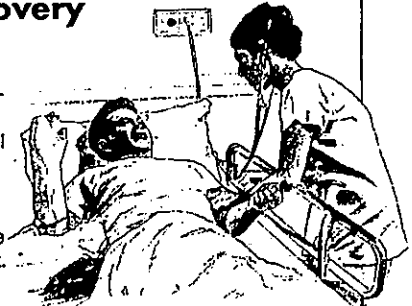
Pre-Op

Your doctor will tell you if you need any lab tests and discuss whether you will have local or general anesthesia. You may be instructed to have no breakfast or liquids after midnight the night before surgery, and to wash your arm the night before.



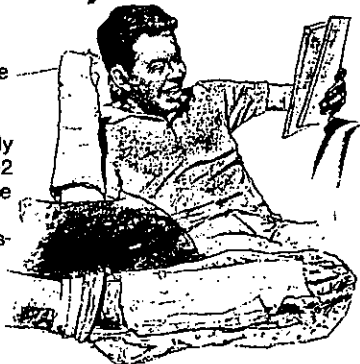
Post-Op Recovery

During your stay in the recovery room, a nurse will monitor your condition. Your hand will be bandaged; your arm will be elevated and in a cast or splint. Be sure to make arrangements beforehand to go home with a responsible adult.



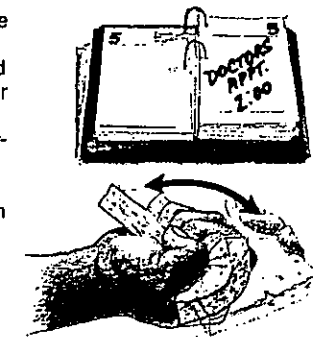
At-Home Recovery

Follow your doctor's advice about keeping the arm elevated above heart level to reduce swelling and promote healing. You will usually need to rest at home 1-2 days; then slowly increase activity. When you shower, cover the dressing with a plastic bag.



Follow-up and Rehabilitation

Your doctor will arrange for a follow-up visit to examine the incision and remove any sutures. Your rehabilitation program may progress from exercises that maintain circulation to those that improve range-of-motion and strength, such as sponge squeezing.



Call the Doctor if...

...pain medicine doesn't control your discomfort; pain worsens after first 24 hours; there is puffiness or a throbbing feeling; you notice an odor from the wound or have a temperature over 101°.

PREVENTION, DIAGNOSIS, AND TREATMENT

Prevention is the best "treatment" for carpal tunnel syndrome (CTS), and there may be ways for you to reduce your risk at home and at work. Once symptoms occur, be sure to see your doctor for diagnosis and appropriate treatment. Early diagnosis and treatment can mean early relief from the pressure, pain, and tingling of CTS, so you can use your hand and sleep again without discomfort. By taking action early, you can help prevent and minimize symptoms while reducing the risk of permanent damage to your wrist.




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