

Your Body, Your Job

*Preventing Carpal Tunnel Syndrome and Other
Upper Extremity Musculoskeletal Disorders*



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and Other Upper Extremity
Musculoskeletal Disorders*

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Introduction

New technologies, new equipment and new ways of performing work have often brought with them new hazards to workers' health.

Workplaces have become increasingly mechanized or machine-paced. Computers and electronic equipment have brought many improvements into the workplace.

Unfortunately, they can also require workers to perform the same task or tasks over and over again. Sometimes the pace of the machines or jobs is greater than the workers' ability to safely keep up.

This booklet looks at **carpal tunnel syndrome (CTS)** and other types of **upper extremity musculoskeletal disorders (MSDs)**, and the groups of workers at risk. It also suggests ways to prevent these disorders, including changes that can be made in the workplace, and gives referrals for getting help.

Some Facts about Musculoskeletal Disorders

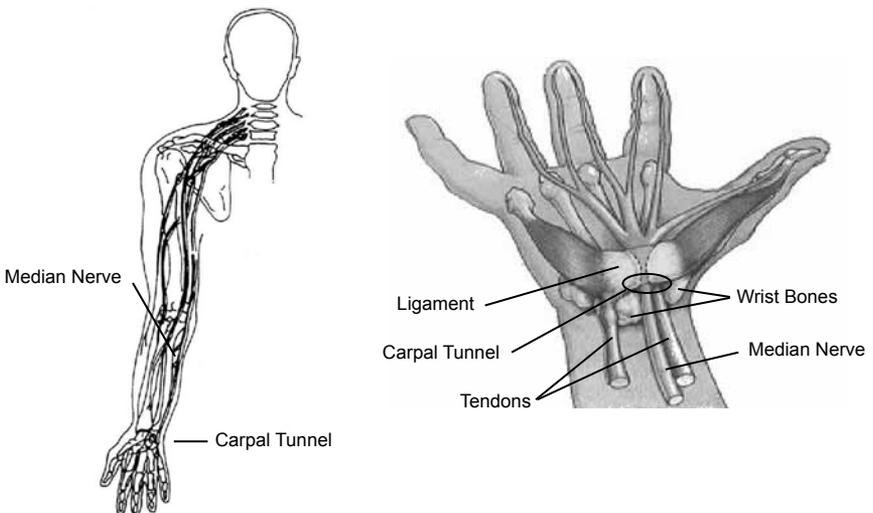
The number of Washington State Fund workers' compensation claims for carpal tunnel syndrome (CTS) that involved lost work time averaged 1,427 per year from 1997 through 2009. The average cost per claim was \$48,062. The average number of lost workdays per claim was 286.9. For the same period, the average number of claims for rotator cuff syndrome was 1,130 per year, costing an average of \$71,789 and 375 lost workdays per claim.

What Is Carpal Tunnel Syndrome?

Carpal tunnel syndrome (CTS) is the compression of the median nerve at the wrist, due to inflammation or the lack of blood flow to the nerve.

The carpal tunnel is a medical term for the opening within the wrist formed by the carpal bones in the wrist and a thick band of ligaments (fibrous tissue). The median nerve, blood vessels and tendons pass from the arm into the hand through this opening that looks like a tunnel.

If the tendons become inflamed and swollen in this small space, they may press against the median nerve. Over time, this pressure may result in nerve damage and a decrease in the motor or sensory function of the thumb, the first three fingers and the palm of the hand. This condition is called Carpal Tunnel Syndrome or "CTS".



The symptoms of CTS include pain, numbness, burning and a “pins and needles” sensation in the hands. These symptoms often wake the person from sleep. People with this condition may have dry palms and their hands may become clumsy. It is common for a person with CTS to drop an object he or she is holding in the affected hand. In the most severe and rare cases, paralysis may occur. One or both hands can be affected.

CTS is only one of several types of disorders that affect the upper extremities. Other types of upper extremity musculoskeletal disorders that affect tendons include:

- Tendonitis or tenosynovitis:** Pain and swelling of the tendon or its sheath which lubricates the tendons that go from the forearm to the hand.
- Epicondylitis:** Pain and tenderness below the two bony points on either side of the elbow (also known as “tennis elbow” or “golfer’s elbow”).
- Rotator cuff syndrome:** Pain, tenderness or weakness (if there is a tendon tear) in one or more of the four tendons that help the shoulder to rotate (also known as “pitcher’s shoulder” or “impingement syndrome”).

What Causes Carpal Tunnel Syndrome?

Work-related CTS

Carpal tunnel syndrome can develop when the median nerve is compressed, or squeezed, at the wrist. This can occur in different ways. While there is rarely only one cause of CTS, one or more of the following work activities (Pages 4-6) can contribute to CTS or to hand/wrist tendinitis.

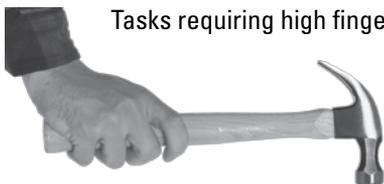


Repeated rapid movements of the hand and wrist, and tasks done while the hand or wrist is held in a bent or awkward position, or using a vibrating tool.

Using a forceful “pinch-grip” with your fingers.



Tasks requiring high finger, hand and wrist forces.



Pressure on your hand, especially into the palm, for long periods.

The greater the number of risk factors in the same job, the higher the risk.

The longer the exposure to high pinch or grip force, the greater the risk for CTS and hand/wrist tendonitis.

Other considerations:

Some medical conditions can also cause tissues in the narrow tunnel to swell or the fluid in the tunnel to increase. These include diabetes, rheumatoid arthritis, pregnancy and thyroid problems. And although it is not known how underreported the problem of carpal tunnel syndrome is today, jobs such as meat cutting, food processing, lumber handling, construction, industrial sewing, cashiering, automated mail sorting, plumbing and a wide variety of assembly and packing positions require highly repetitive and forceful motions as well as awkward wrist postures.

How do I know if I have CTS?

Some warning signs of CTS are:

- Pain, numbness and tingling in the thumb and first three fingers (like your fingers are “asleep”). Pain is usually worse at night.
- Shaking your hand to get the feeling back.

Affected Area



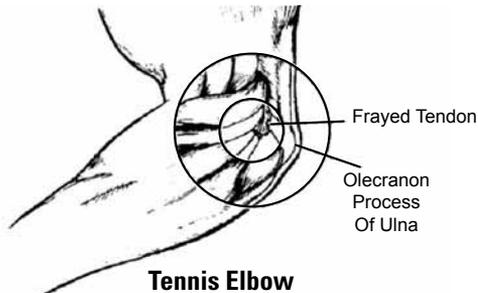
- Weakness in your hand, usually the hand that you use the most.
- Pain sometimes going up into your elbow or shoulder.
- A clumsy feeling in the affected hand.

Palm side of the hand

There are at least 100 reasons why a person may have numbness and tingling in the fingers. Carpal tunnel syndrome is only one of them. If you have recurring numbness, tingling or pain with no improvement over the weekend, see your health care provider. Early recognition and treatment is important in preventing more serious problems. The same applies for tendinitis, epicondylitis and rotator cuff syndrome.

What Causes Epicondylitis?

Epicondylitis is caused by continual stress on the forearm muscles and the tendons that attach the muscles to the elbow. The results can be partial tears or swelling in these tissues at the elbow.



Work-related contributors include:



Repetitive forearm twisting motions such as with using a manual screwdriver.

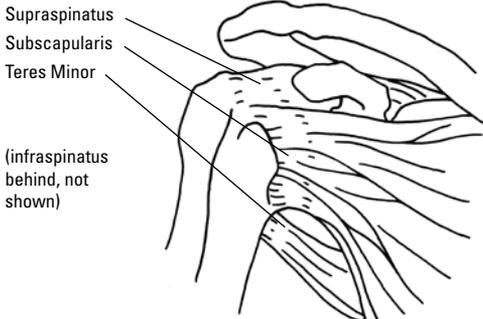
Prolonged forceful bending of the wrist while the forearm/hand is twisted downward (pronated) or upward (supinated).



What Causes Rotator Cuff Syndrome?

Rotator Cuff Syndrome is the inflammation, degeneration or tearing of the tendons about the shoulder. The rotator cuff consists of the tendons of four muscles that surround the shoulder joint and provide stability. These tendons usually slide easily in a space beneath the shoulder blade. If the tendons become swollen, the space through which they move will be reduced and movement of the shoulder can become restricted.

Rotator cuff tendons



Work-related contributors include:



Repeatedly elevating the arms

Keeping the hands above the head while doing overhead work, particularly with any weight in the hand. The risk increases with forceful exertions.

Other factors associated with upper extremity MSDs include:

- Exposing your hands to cold temperature for long periods.
- Wearing gloves that don't fit.
- Using tools that don't fit your hand properly or that require great effort to grasp. A poorly maintained power tool can increase the amount of force you have to use up to 25%.
- Vibrating tools such as impact wrenches, grinders, jackhammers and chainsaws with medium to high vibration values.

The work factors described above and on the pages before are called risk factors and can be found in a wide variety of jobs. When identifying these risk factors, alone or in combination, the following should be kept in mind:

1. the frequency of the task (**how often?**)
2. the duration of the task (**how long?**)
3. The amount of forceful exertion (**how hard or fast?**)
4. The weight of the object (**how heavy?**)

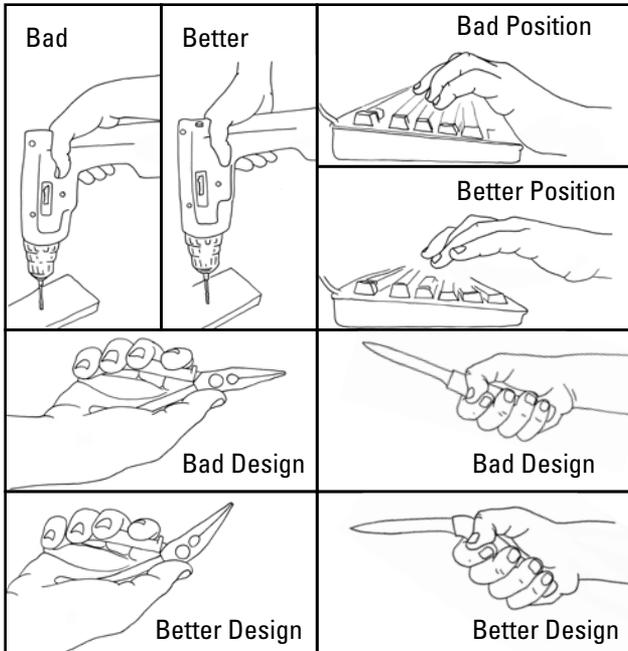
How to Prevent Work-Related CTS

The key to preventing work-related upper extremity MSDs such as CTS is to redesign jobs to fit people rather than trying to make people fit the job. The study of safe job design and worker health is called **ergonomics**. Since carpal tunnel syndrome and other MSDs can result from poorly designed workstations or tools, the cause can vary from job to job. An effort should be made to identify specific problems for each employee in a workplace where they are exposed to musculoskeletal disorder risk factors.

Once workers and employers understand the risk factors of a job that can lead to carpal tunnel syndrome, steps should be taken to review workstations, tools or the flow of work.

A few words about the tools you use at work:

To prevent hand and wrist disorders, tools and equipment should be designed or positioned to allow your hands and wrists to be straight and relaxed, in what is called a neutral position, while you use them. Here are some examples of *bad* and *better* tool setups.



Things your employer can do

Your employer has a legal responsibility to provide a healthy and safe workplace. Some steps your employer can take to improve ergonomic-related problems include:

- Work with someone trained in ergonomics and health and safety inside or outside the company to evaluate the risks.
- Provide training to workers on how to avoid or eliminate hazardous motions or postures.
- Conduct a survey of employees to identify problem areas.
- Talk to equipment makers and engineers about redesigning the work or tools in problem areas.

Things you can do:

- Participate in your company's **Health and Safety Committee** or **Ergonomics Committee**. It's an excellent way to build on your experience with CTS and other work-related upper extremity MSDs. Or help form a committee if your co-workers and management are willing. Such committees can look for solutions to jobs that may be contributing to sore hands, wrists, arms and shoulders.
- Get training on how to work safely if you get new equipment or move to a new job.
- Talk to the plant nurse or health and safety specialist, if your company has one, about any problems you are having.
- Share this booklet with other workers. The best way to prevent this disorder is to understand the risk factors and recognize any symptoms early on.

Treatments for CTS

The best treatment for carpal tunnel syndrome is a change in the specific work practices that caused the problem or rest from those work activities. In the earliest stage of the disorder, you may feel better by resting your hands and wrists, by alternating tasks, or by icing the palm side of your wrist. It is important to see your doctor as soon as you recognize the early symptoms of pain, numbness or tingling in the hand. Your doctor may send you to a nerve specialist (neurologist) or an occupational or physical therapist for further tests or treatment.

Most physicians receive very little training in occupational health. They may not know which job characteristics can put you at risk for developing carpal tunnel syndrome. Help educate them!

- When you go for medical care, make sure to describe your job (use the detachable checklist at the end of this booklet to help write down things about your job).
- Make sure you understand any treatment your health care provider recommends. If you have any questions, discuss them with your doctor or physical or occupational therapist.

Medical treatments include:

- *Wrist-Splint*, this is a soft, cast-like wrapping put around your hand and wrist to keep your wrist from bending. It is usually worn at night. If you wear it at work make sure your job does not require you to work against the splint. This could make symptoms worse.
- *Tennis elbow band*, this is soft band that tightens over the muscles in your upper forearm. It keeps you from overexerting forearm muscles.
- *Cold and hot baths* (contrast baths) as directed by a physical or occupational therapist. Heat alone is not recommended. Ice massage may be used.
- *Anti-inflammatory medications* help reduce the swelling in your wrist and help take the pressure off the median nerve. They can reduce swelling in the elbow and shoulder as well.
- *Limited steroid injections* into the wrist, elbow or shoulder (where the tendon inserts) may provide temporary relief.
- *Surgery* may be recommended for very severe cases. This is usually done after other forms of treatment have been tried first. The surgical procedure for CTS opens up a ligament (tissue) over the carpal tunnel and relieves the pressure on the nerve.

An important thing about all of these treatments:

If your carpal tunnel syndrome is work-related, the job or tool design *must* also be changed. Otherwise, even after successful treatment, the same problem can occur again.

Steps to Take if MSDs Might Be a Problem in Your Workplace

1. Identify where the problems are occurring. Use a brief symptoms questionnaire among all workers to figure out where most of the problems are occurring. Encourage workers to report any symptoms early.
2. Identify risk factors that may be causing the problems using the detachable checklist at the end of this booklet. Ask workers what they think are the most difficult parts of the job and possible solutions. You can also obtain additional copies of the checklist by viewing the Adobe Acrobat document on the Web at: www.Lni.wa.gov/Safety/Research/Files/WorkplaceRiskFactorsChecklist.pdf.
3. Meet with the local health and safety committee to discuss your findings and come up with possible solutions. If problems seem very complex, seek outside expertise (see resource list – Page 12). Include workers and their supervisors in the discussion of solutions for their jobs.
4. Implement the solutions that take care of the most problems without creating new ones.
5. Evaluate the success of the solutions in reducing risk factors – use the checklist again to get feedback from workers.

Summary

Work injuries are costly to everyone – to the injured worker and his or her family, the employer and the larger community. Since some musculoskeletal disorders appear to be increasing in our fast-paced factories and offices, it is important for workers and employers to learn more about these illnesses and how to prevent them.

Because carpal tunnel syndrome can result from repetitive motions over a long period (usually months), many workers don't recognize or report early symptoms. Others don't associate their pain with the work that they do. By knowing what risk factors to look for in your job you can help play a role in protecting your own health and that of your co-workers.

Some companies involve their employees in coming up with ergonomic solutions to musculoskeletal problems. This is an important first step in recognizing that job improvements may help prevent illness, and improve productivity.

Where to Get More Information or Help

SHARP Program

Department of Labor & Industries
P.O. Box 44330
Olympia, WA 98504-4330
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1-888-66-SHARP (1-888-667-4277)
www.Lni.wa.gov/Safety/Research

Division of Occupational Safety and Health (DOSH)

Department of Labor & Industries
P.O. Box 44600
Olympia, WA 98504-4600
360-902-5580
1-800-423-7233
www.Lni.wa.gov/safety

Occupational and Environmental Medicine Clinic

Harborview Medical Center
325 – 9th Ave.
Seattle, WA 98104
206-744-9372

Department of Environmental and Occupational Health Sciences

University of Washington
P.O. Box 357234
Seattle, WA 98195-7234
206-543-6991
www.Depts.washington.edu/envhlth

Ergonomics Tools from L&I

The Washington State Department of Labor & Industries (L&I) provides ergonomics tools and information online. Visit these useful sites:

- www.Ergonomics.Lni.wa.gov
- www.ErgoIdeas.Lni.wa.gov



WORKSHEET FOR POSSIBLE RISK FACTORS ON YOUR JOB
(Keep this with your records, or take it with you to your family doctor)

Job Title _____ Number of years in this job _____ Number of hours per shift (usual) _____

What kinds of tools do you use at work? _____

Describe what you do in your job — specifically what kind of tasks do you do with your:	How many times per hour?	How long at a time?	Pain with this activity?
Fingers _____ _____	_____	_____	_____
Hands _____ _____	_____	_____	_____
Wrists _____ _____	_____	_____	_____
Elbows _____ _____	_____	_____	_____
Shoulders _____ _____	_____	_____	_____
Neck _____ _____	_____	_____	_____

Do you have any of the symptoms mentioned in this booklet? Yes _____ No _____

Which ones and when do they occur? _____

Do you pick objects weighing more than 10 pounds with each hand? Yes _____ No _____

Do you grip slippery objects? Yes _____ No _____

Do you push or pull forcefully with your hands alone? Yes _____ No _____

Do you forcefully pinch objects? Yes _____ No _____

Do you need a lot of finger strength to manipulate objects? Yes _____ No _____

Do you frequently bend or twist the wrist? Yes _____ No _____

Do you frequently use vibrating tools? Yes _____ No _____

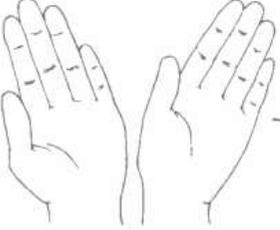
Do you frequently use your hand as a hammer? Yes _____ No _____

Do you type intensively on a keyboard for long periods? Yes _____ No _____

Please check any of the following hand/body positions you use frequently on your job:



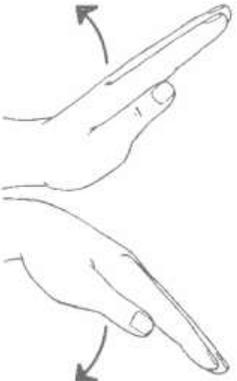
Pinch Grip



Radial & Ulnar Deviation



Forearm Rotation



Wrist Flexed/Extended

SHARP Program

Research for Safe Work

Bottom line – safe workplaces are good for people and good for business. SHARP conducts the research that businesses and labor groups need to identify and prevent workplace hazards and reduce the human and economic costs of on-the-job injuries and illnesses. SHARP partners with business and labor to develop and evaluate practical real-world solutions that benefit workers and employers.

SHARP is a program of the Washington State Department of Labor & Industries.

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