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A Patient's Guide to

Cumulative Trauma Disorder

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Introduction

Cumulative trauma disorder (CTD) is a broad category that includes many common diseases that affect the soft tissues of the body. CTD in itself is not a disease. Doctors use the concept to understand and explain what may have caused, or contributed to, certain conditions. Examples of the conditions that may be caused or aggravated by cumulative trauma include carpal tunnel syndrome, tennis elbow, and low back pain.

Other terms are often used to describe the concept of CTD. These include *repetitive stress injury* (RSI), *overuse strain* (OS), and *occupational overuse syndrome* (OOS). This document will refer to these categories generally as CTD.

This guide will help you understand

- **what factors may contribute to CTD**
- **how doctors diagnose conditions related to CTD**
- **what treatment options are available**
- **how to prevent CTD**

Causes

What causes CTD?

Opinions abound as to what may cause CTD, but there is very little agreement. Some of the theories about how CTD starts are described below. The theories include

- overuse
- muscle tension
- nerve tension
- psychosocial factors
- mind-body interaction
- contributing factors

Overuse

Using muscles and joints after they have become fatigued, or overly tired, increases the likelihood of injury. Overloaded muscles and soft tissues without proper rest have no chance to recover fully. This problem often hampers athletes who have to throw, jump, or run repeatedly. It can also affect people who work in jobs where they keep doing the same action again and again, such as typing, gripping, and lifting.

All body tissues are in a constant state of change. Minor damage occurs continuously, which the body must repair in the normal course of a day. But the damage can occur faster than the repair mechanisms can keep up with it. When this happens, the tissues become weaker. They may begin to hurt. The weaker the tissues become, the more likely they will suffer even more damage. A cycle begins that looks like a spiral--constantly downward.

Muscle Tension

Some doctors think muscle tension causes CTD. To function, or work properly, the body and each of its parts needs a steady supply of blood, rich in oxygen and nutrients. Nutrients are the body's fuel—glucose, for example. Cutting off or slowing the blood supply harms the tissues of the body.

Tense muscles are believed by some to actually squeeze off their own flow of energy and fuel. Muscles can get energy without oxygen, but the process produces a chemical

called lactic acid. This chemical can be a potent pain-causing chemical. Lactic acid is a chemical that can produce a burning feeling when muscles are overexercised. Some physicians believe that lactic acid produced by tense muscles may cause some of the symptoms of CTD.

As pain develops, muscles tighten even further because they attempt to guard the surrounding area. *Guarding* is a term that is used to describe a reflex that all muscles in the body share. When pain occurs anywhere in the body, muscles around the painful area go into *spasm* (they tighten uncontrollably) to try to limit the movement in the area. As a result, blood flow is slowed down even more. The muscles begin to ache more. The nerves that have their blood supply reduced and squeezed by muscles begin to tingle or go numb.

Nerve Tension

This theory suggests that nerves become extra sensitive when they've become shortened and irritable. It is thought that poor postures used over long periods causes muscles to bulk up and interfere with blood flow. The nerves that course through the body then become shortened and may begin to stick to the nearby tissues. Moving the arm or leg puts tension on the nerve and can cause pain to radiate along the limb. The problem is thought to get worse from stress because the muscles and nerves tense up and become even tighter. Also, when the same activities are done over and over again, the tight nerve is pulled and strained to the point that it can't heal and eventually becomes a chronic source of symptoms.

Psychosocial Factors

Problems with CTD tend to be more common among people who suffer from boredom, who have poor working relations, who aren't satisfied with their jobs, and who have unhappy social circumstances. Reasons why this is so are unclear. The number of CTD cases reported may also be influenced by state worker's compensation rules. States where claims are processed quickly and with greater benefits tend to have higher volumes of CTD cases. Both of these findings suggest that many cases of CTD may be highly influenced by the patient's perception of the overall situation. Some patients may subconsciously, or consciously, rationalize their symptoms due to many factors that are not medical but have to do with their overall job and social situation.

Mind-Body Interaction

A newer theory suggests that there isn't really an injury going on in the soft tissues where symptoms are felt. Instead, the problem is said to be coming from influences within the mind. It is theorized that the brain starts producing pain signals as a cover-up for deep-rooted feelings of past emotional pain or problems. Though the idea sounds hard to believe, practitioners using this approach claim they have had success rates as high as 95 percent. Their patients are reported to have gotten swift relief from treatments aimed at the underlying and unconscious emotional triggers.

Contributing Factors

The way people do their tasks can put them at risk for CTD. Some risk factors include

- force
- awkward or static postures
- poor tool and equipment design
- fatigue
- repetition
- temperature
- vibration

One of these risk factors alone may not cause a problem. But doing a task where several factors are present may pose a greater risk. And the longer a person is exposed to one or more risks, the greater the possibility of developing CTD. Many different symptoms can

arise from the accumulation of small injuries or stresses to the body. CTD is not so much a disease as it is a response to excessive demands these factors can place on our bodies without giving them adequate time to recover between.

Symptoms

What does CTD feel like?

The symptoms of CTD usually start gradually. Patients usually don't recall a single event that started their symptoms. They may report feelings of muscle tightness and fatigue at first. People commonly report feeling numbness, tingling, and vague pain. Others say they feel a sensation of swelling in the sore limb. Some patients with arm symptoms sense a loss of strength and may drop items because of problems with coordination. Symptoms often worsen with activity and ease with rest.

Diagnosis

How do doctors diagnose CTD?

Your doctor begins the evaluation by taking a history of the problem. You'll probably be asked questions about your job, such as the type of work you do and how you do your job tasks. Other questions give your doctor information about your work conditions, such as the postures you use, the weights you have to lift or push, and whether you have to do repetitive tasks. You may be asked about how you like your job and whether you get along with your supervisors and coworkers.

Your doctor will do a thorough physical examination. Your description of the symptoms and the physical examination are the most important parts in the diagnosis of CTD. Your doctor will first try to determine what conditions are affecting you. For example you may have symptoms of carpal tunnel syndrome or tennis elbow that need to be treated. Second, your doctor will try and determine if cumulative trauma is playing a role in your condition. If so, part of the treatment will be to try and eliminate the source of the cumulative trauma.

There are no specific tests that can diagnose CTD. There are many tests that may be ordered as your doctor looks for specific conditions.

Treatment Options

What treatments are available?

Nonsurgical Treatments

Many nonsurgical treatment approaches are used by physicians, physical and occupational therapists, and other health providers to reduce the symptoms of CTD-related conditions. A splint may be suggested initially to protect and rest the sore area. Anti-inflammatory drugs are often used together with therapy treatments such as ultrasound, cold packs, or electrical stimulation. A series of exercises may be suggested to help tissues move safely while healing.

Surgical Treatment

Surgery is rarely indicated for CTD. Specific conditions that can occur as a result of CTD may require surgery. Unless the doctor is quite sure there is a structural problem, such as a pinched nerve or severely inflamed tendon, then surgery is not usually suggested.

Prevention

How can I help prevent problems of CTD?

The best medicine for treating CTD is to prevent the problem from occurring in the first place. Key items to consider when attempting to prevent problems with CTD are listed below.

Use healthy work postures and body alignment. Posture can have a significant role in CTD. Faulty alignment of the spine or limbs can be a source of symptoms. Using healthy posture and body alignment in all activities decreases the possibility that CTD will strike.

Incorrect posture may lead to muscle imbalances or nerve and soft tissue pressure, leading to pain or other symptoms. Most people spend many hours at their work place, and using unhealthy posture during these long hours increases the likelihood that CTD will develop.

Ergonomics

Assessing where and how a person does work is called ergonomics. Even subtle changes in the way a work station is designed or how a job is done can lead to pain or injury.

Rest and Relax

Rest and relaxation (*R and R*) have recently become front-line defenses in the prevention of CTD. Methods can be as simple as deep breathing, walking, napping, or exercising.

This strategy is useful during work and off hours. Whether at home or work, our bodies need time to recover, which simply means giving them a chance to heal. Rest and relaxation allow the body to recover and provide a way of repairing these injured tissues along the way, keeping them healthy.

The following ideas may be used to foster rest and relaxation at work:

- Be relaxed. Try to work with your muscles relaxed by pacing your work schedule, staying well ahead of deadlines, and taking frequent breaks.
- Stop to exercise. Gentle exercise performed routinely through the day helps keep soft tissues flexible and can ease tension.
- Change positions. Plan ways to change positions during work tasks. This could include using a chair rather than standing or simply readjusting your approach to your job activity.
- Rotate jobs or share work duties. This can be fun by offering a new work setting, and it allows the body to recover from the demands of the previous job task.
- Avoid caffeine and tobacco. These can heighten stress, reduce blood flow, and elevate your perception of pain.

Rehabilitation

What can I expect with treatment?

Getting treated right away for symptoms of CTD can shorten the time it takes to heal. Symptoms can sometimes go away within two to four weeks when steps are taken quickly to address the factors that may be causing your symptoms. However, people who keep doing activities when they have symptoms and don't seek help right away may be headed for a long and frustrating recovery time, perhaps as long as a year or more.

Your doctor may have you work with a physical or occupational therapist to speed your recovery. Your therapist will want to gather more information and will further evaluate your condition. The answers you give and the results of the examination will guide the therapist in tailoring a treatment program that is right for you.

Therapists often teach patients ways to relax. Relaxation ideas often include helping you learn to breathe deeply by using your diaphragm muscle. Taking the time to relax and breathe deeply eases tense muscles and speeds nutrients and oxygen to sore tissues.

Your therapist may apply treatments such as heat, ice, ultrasound, or gentle hands-on stretches to reduce pain or other symptoms. Muscle stretching may be used to restore muscle balance and to improve your posture and alignment. Therapists sometimes apply stretches that are designed to help nerves glide where they course from the spine to the arms or legs.

Strengthening exercises are used to restore muscle balance and to improve your ability to use healthy postures throughout the day.

Therapists pay close attention to your posture and movement patterns. You may receive verbal instruction and hands-on guidance to improve your alignment and movement habits. Helping you see and feel normal alignment improves your awareness about healthy postures and movements, allowing you to release tension and perform your activities with greater ease.

Your therapist will spend time helping you understand more about CTD and why you are feeling symptoms. You may be given tips on how to combat symptoms at work using rest and relaxation. You may also be given specific stretches and exercises to do at work.

Your therapist may visit your work place to analyze your job site and to watch how you do your job tasks. Afterward, your therapist can recommend changes to help you do your job with less strain and less chance of injury. These changes are usually inexpensive and can make a big difference in helping you be more productive with less risk of pain or injury.

Your therapist's goal is to help you understand your condition, to look for and change factors that may be causing your symptoms, and to help you learn how to avoid future problems. When patients are well underway, regular visits to the therapist's office will end. Your therapist will continue to be a resource, but you will be in charge of practicing the strategies and exercises you've learned as part of an ongoing program.

Notes