Repetitive Strain Injury

What is Repetitive Strain Injury?

You are typing on your computer when you start to feel a tingling sensation in your hands and your neck muscles start to ache. You ignore it and work on because you need to finish that paper, manuscript or report you are writing. You may be experiencing the early symptoms of repetitive strain injury (RSI) and need to adjust your computer space and work habits! Take stock of what you are doing and how you are sitting. Anyone is susceptible to RSI; professors, students, and office personnel. The keys to reducing this injury are prevention and identifying the symptoms early.

The overuse or misuse of muscles, tendons, and nerves damages these tissues and can lead to repetitive strain injury. In general, any activity which involves repetition, awkward or fixed posture, forceful movements, and little or no rest can lead to RSI. More debilitating forms of this injury include carpal tunnel syndrome (CTS), tendonitis, tenosynovitis, ganglionic cysts, and other upper body strain conditions. The CTS and thoracic outlet syndrome are two of the most disabling RSI. These conditions are disorders of the tendons, nerves, arteries, or veins occurring at the wrist and upper arm, respectively. In CTS, repeated bending or use of the wrist and fingers results in the compression of the median nerve causing intermittent numbness, tingling, and pain in the side of the hand including the thumb through the inside of the ring finger. If untreated, these symptoms can become chronic and permanently disabling, and may cause a change in one's lifestyle and career.

Your computer use: What do you do?

Constant use of a computer is one of the most prominent ways in which a person can incur a RSI. Behaviors that can lead to RSI and how they can be adjusted are described in "RSI producing behaviors and how to correct them." You might ask, "Why didn't people using the keyboard of a typewriter develop RSI?" The answer is simple: breaks. Natural breaks were built into the workday with typewriter use, for example changing paper, manual carriage return, correction of typos, and getting up to use the file cabinet or other equipment. Computers have eliminated the need for most of these activities. Instead the day is full of constant repetitive motions. It is important to become aware of your own computer work style and follow the behavioral guidelines. **In short: take breaks, stretch and relax.**

No quick fixes

No matter how much you want symptoms to disappear quickly, treatment and healing cannot be rushed. Generally, the long process of treating RSI should be inspiration enough to prevent misuse or overuse. Rest is a key treatment, the duration of which correlates directly with the severity of the injury. Other interventions can include ergonomic adjustment, stretching, muscle strengthening, postural retraining and other physical therapy modalities. Surgery is rarely necessary and it may not always bring complete relief. Keep in mind that severity of symptoms, diagnoses, and treatments vary from person to person. Splints, fancy and ergonomic keyboards, and wrist pads for

Repetitive Strain Injury producing behaviors and how to correct them.

Behavior: Excessive bend or extension of the wrists.

Correction: Wrists in a neutral position not resting on anything, unless one is not actively typing. Fingers in a straight line with the forearm, and the back edge of the keyboard tilted down.

Behavior: Hunched or slouching posture.

Correction: Comfortable vertical torso with a chair supporting the lower back.

Behavior: Sitting too far from the screen due to a document on one's lap.

Correction: A document holder adjacent to the monitor, sitting 20-24" away from the screen, and at 5-15 degrees below the horizontal line of sight.

Behavior: Excessive bend or extension of the elbow.

Correction: Elbows positioned at a 90 degree angle by adjusting the chair and keyboard position.

Behavior: Two-finger typing or punching the keys.

Correction: Soft touch-typing with proper technique.

Reference:

http://eeshop.unl.edu/rsi.html

http://office-ergo.com/index.html

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Tousignant, M. (1999). "Loaded for learning." *, September 14, p. Z14.*

Wilson, A. (1994). *Are You Sitting Comfortably? A Self-Help Guide For Sufferers of Back Pain, Neck Strain, Headaches, RSI and Other Associated Problems*. London: Optima, Little Brown and Co.

Ten Things You Should Know About Hand and Wrist Pain

(also called Cumulative Trauma Disorders (CTDs))

Taken from **http://www.office-ergo.com/alternat.htm**

1. There are many kinds of CTD medical conditions that have ergonomic causes among office workers, including carpal tunnel syndrome and various kinds of tendon inflammation. Some other disorders, such as myofascial pain syndrome, fibromyalgia, thoracic outlet syndrome, and reflexive sympathetic dystrophy are believed to be the results of cumulative trauma in some cases.
   Because of the complexity and subtle differences between disorders, physicians don't always diagnose CTD's correctly or easily. The most knowledgeable medical specialists for CTD's are generally considered to be physiatrists, or physical medicine specialists.

2. CTDs can happen when there is very little repetitious work. Besides repetition, other possible causes include
   - Holding one position. Muscles that hold a body part in position for long periods are more prone to fatigue than muscles that move a body part around.
   - Non-neutral postures. In this context, "posture" is the position of an individual joint, not overall body posture. Any posture significantly different from "neutral" is considered to be at risk for musculoskeletal distress. "Neutral" is considered to be the position about halfway through the available range of motion for the joint.
   - Localized pressure. Direct pressure on nerves or tendons can cause damage in the long run. The wrist is one location of concern. The elbow (the funny-bone or crazy-bone nerve) is another.
   - Use of force. Even small exertions can cause stress if small muscles are involved. Sudden, fast motions involving a jerk or snap.
   - Cold temperatures.
   - Vibration, as with hand-held power tools or whole-body vibration as caused by driving heavy equipment.

3. Keeping these causes in mind, some of the rules of thumb for preventing CTD's are:
   - Break up repetitious work.
   - Relax. Don't use your muscles to hold your hands or shoulders in a particular position. Keep your limbs and shoulders limp as much as possible, even during short pauses.
   - Use moderate postures for individual joints. Stay away from positions near the extremes of your joints' range of motion --- the most neutral joint position is about halfway.
   - Minimize contact with hard or sharp surfaces. This is especially important at the wrists and elbows.
   - Don't use too much force. Notice any exertions you have to make and see if they can be eliminated. "Exertions" don't have to involve breaking into a sweat. They can be subtle, such as pulling a hard-to-reach drawer or lifting a heavy file.
   - Move with an even motion. Avoid snapping the wrist or jerking against outside forces.
   - Keep your hands and fingers warm. Consider gloves or even fingerless gloves.
   - Break up exposures to vibration.

4. Fitting the physical workspace to the worker" is often touted as the best way to prevent CTD. This is an incomplete view. Although physical workstation design, physical tool design, and adjustability are important, there are many other work-related factors. Three less tangible but extremely important factors are job design, stress control, and individual workstyle.

   Examples of job design are infrequent or inflexible breaks, low activity variety, and fast pace. Examples of stressors are deadlines, monitoring, and bad management. Examples of harmful workstyles (in the context of computer work, for instance) are how hard the individuals hits keys, how the individual holds his/her wrists, and where the individual places the mouse.

5. Most CTD's are preventable and curable if caught early. The key is to notice trouble when it starts --- and do something about it. Early signs may include persistent pain, tingling, numbness, burning, or aching. The signs may be constant or may occur mostly after certain activities. The drastic cures --- such as surgery --- are not reliable and should be a last resort. Nevertheless, a health professional should be consulted when you are concerned about possible early signs.

6. Some people get CTD's because their bodies are vulnerable to them. For example, carpal tunnel syndrome seems to be related to diabetes, overweight, thyroid conditions, hormone conditions such as those caused by hysterectomy or removal of both ovaries, rheumatoid arthritis, previous injuries, and other conditions. Smoking may also increase the risk. Anyone with any of these conditions --- particularly obesity --- should be especially careful about prevention.

7. CTD's can happen because of non-work activities. Hobbies, sports, driving, and even sleeping positions can contribute to them. Any attempts at treatment or prevention should include a look at off-the-job factors.

8. One of the most important preventive measures is 'variety.' In other words, change posture and activities often. If possible, take breaks before getting tired. Extremely short breaks can be very helpful of frequent enough. A "break" doesn't have to be a rest break --- it can simply involve doing something else for awhile.

9. Don't follow CTD prevention rules without looking for consequences. Every fix has a drawback. Every ergonomic rule or gizmo has a downside which can possibly make matters worse rather than better. The best way to evaluate ergonomic fixes is by considering all the ergonomic risk factors described above in #2. Example: a wrist rest may force a straighter wrist (vertically) but may put too much pressure on the underside of the wrist or make the individual bend the wrist sideways to reach side keys.

10. Total CTD prevention involves ergonomics (changing the environment), ergonomics education (changing work styles or habits), medical management (optimizing treatments and return-to-work procedures), and management (monitoring statistics to find the most hazardous jobs and working proactively). CTD's usually cannot be adequately dealt with without all four approaches happening together. Many obstacles to good ergonomics are not scientific, medical, or engineering reasons ... they are political in nature.