

Interpreting & Biomechanics

Cumulative Trauma Disorder*

Cumulative trauma disorder (CTD) refers to a collection of disorders associated with nerves, muscles, tendons, bones, and the neurovascular (nerves and related blood vessels) system. CTD involves the following:

- The repetitive performance of a physical task
- A task repeatedly done with force, speed, or with extremities placed in awkward positions
- Insufficient rest at appropriate intervals and inadequate recovery time

CTD symptoms may involve the neck, back, shoulders, arms, wrists, or hands. Interpreters with CTD may experience a variety of symptoms including: pain, joint irritability, swelling, pins and needles sensations, numbness, and skin color/texture change.

Initially, symptoms may begin during or immediately following an interpreting assignment and subside within a few hours. Or, they may first occur at night, disrupting sleep. Unaddressed symptoms may become more pronounced, lasting for a longer time. Eventually symptoms may become incessant, obstructing normal daily activities.

One component of a multifaceted prevention and management program of CTD is biomechanics.

What is Biomechanics?

Biomechanics relates to an interpreter's workstyle and is affected by their posture, movements, and periods of rest.

Good posture maintains the proper alignment of one's bones and connective tissues (muscles,

tendons, ligaments, arteries, and veins) and provides a stable base from which to work.

Biomechanical movements of the body (mainly the arms) can be generally classified as low risk or high risk. It is important that interpreters strive to work with a low-risk work style. This requires the modification of the interpreter's work style movements. Movements fall into the following categories: *hand/wrist position*, *work envelope*, *force*, *static loading*, and "*micro*" rest breaks.

Maintain a neutral *hand/wrist position* as much as possible. Frequent deviations (the severe bending of the wrist in any direction from a neutral position) correlate strongly with CTD injuries.

The interpreter's *work envelope* is the signing space. A normal work envelope usually is composed of a space approximately one inch beyond shoulder width extending from the head to the waist and with a depth of approximately half of the fully extended arm.

Although the arms sometimes reach to extend the envelope, this should not be the predominant signing style. More tension results when interpreters extend their arms or upper extremities outside the work envelope. Fatigue increases as the distance of reach increases. You can demonstrate this principle by holding a book at waist height near the body, then at shoulder height with arms extended.

Forceful, or "*ballistic*" signing is thought to be a significant contributor to CTD. Signs should not be consistently hard and abrupt.

Static loading means holding a muscle or muscles in a tense position. This can result in muscle

* Based on research from the Center for Occupational Rehabilitation at the University of Rochester (New York) Medical Center

fatigue. Drawing the shoulders up toward the neck is an example of static loading due to stress. There is not sufficient recovery time for healing when muscles are in a constant state of tension.

The more *rest breaks* interpreters take during an interpreting task, the less post-interpreting fatigue they will experience. Interpreters must take adequate rest breaks not only between each assignment, but also during the interpreting task. A "micro" rest break means lowering the hands as often as possible. This can be done by placing the hands in a neutral position on the lap if sitting or to the side if standing. There are many opportunities for rest during an interpreting assignment. For example, a speaker pausing provides an opportunity for interpreters to rest their hands.

Prolonged interpreting (over an hour without a break) also contributes to mental fatigue and may increase errors in the interpreter's work.

Why is it a concern?

With little or no rest, muscles become fatigued. Fatigued muscles, when contracted, restrict blood flow and contribute to the incidence of microtraumas. Microtraumas are microscopic tears in muscle fibers. Over time, and without proper rest breaks, substantial damage can occur to muscles and tendons.

Other possible conditions/problems resulting from inappropriate biomechanics:

- Tendinitis (inflammation of tendons)
- Carpal Tunnel Syndrome (pressure exerted on the median nerve that passes into the hand through the narrow carpal tunnel of the wrist)
- Thoracic Outlet Syndrome (compression of nerves and blood vessels in the neck and shoulder region)

Biomechanical guidelines for working with interpreters:

A rest break of 10 minutes for every hour of an assignment is recommended. If an assignment goes longer than a few hours, a team interpreter should be there to share the workload. This should give each interpreter sufficient opportunities to rest their muscles. Proper support while seated or standing is also important.

For more information on how to contact professionals in the interpreting field, as well as other topics covered by the NETAC Teacher Tipsheet series, visit NETAC's Web site at <http://netac.rit.edu>.

For more information, contact:

Northeast Technical Assistance Center

Rochester Institute of Technology

National Technical Institute for the Deaf

52 Lomb Memorial Drive

Rochester, NY 14623-5604

585-475-6433 (V/TTY)

585-475-7660 (Fax)

Email: netac@rit.edu

<http://netac.rit.edu>



This *NETAC Teacher Tipsheet* was compiled by the Department of Interpreting Services, National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, New York.