



CUMULATIVE TRAUMA DISORDERS IN OFFICE WORKERS

Public Employees Occupational Safety and Health Program



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All sedentary workers...suffer from the itch, are a bad color, and in poor condition...for when the body is not kept moving the blood becomes tainted, its waste matter lodges in the skin, and the condition of the whole body deteriorates.

-Bernardino Ramazzini, 1700

Muscle aches and pains are common to many sedentary jobs...when the body is still, circulation is slowed and as a result fewer nutrients are delivered to the muscles, and fewer wastes are removed from the muscles, blood vessels and spinal discs.

- VDT Guidelines, N.J. Department of Health and Senior Services 2003

WHAT ARE CUMULATIVE TRAUMA DISORDERS?

Cumulative trauma disorders (CTDs) are injuries of the musculoskeletal and nervous systems that may be caused by repetitive tasks, forceful exertions, vibrations, mechanical compression (pressing against hard surfaces), or sustained or awkward positions. Cumulative trauma disorders are also called regional musculoskeletal disorders, repetitive motion disorders (RMDs), overuse syndromes, repetitive motion injuries, or repetitive strain injuries.

These painful and sometimes crippling disorders develop gradually over periods of weeks, months, or years. They include the following disorders which may be seen in office workers:

Carpal Tunnel Syndrome - a compression of the median nerve in the wrist that may be caused by swelling and irritation of tendons and tendon sheaths.

Tendinitis - an inflammation (swelling) or irritation of a tendon. It develops when the tendon is repeatedly tensed from overuse or unaccustomed use of the hand, wrist, arm or shoulder.

Tenosynovitis - an inflammation (swelling) or irritation of a tendon sheath associated with extreme flexion and extension of the wrist.

Low Back Disorders - these include pulled or strained muscles, ligaments, tendons, or ruptured disks. They may be caused by cumulative effects of faulty body mechanics, poor posture, and/or improper lifting techniques.

Synovitis - an inflammation (swelling) or irritation of a synovial lining (joint lining).

DeQuervain's Disease - a type of synovitis that involves the base of the thumb.

Bursitis - an inflammation (swelling) or irritation of the connective tissue surrounding a joint, usually of the shoulder.

Epicondylitis - elbow pain associated with extreme rotation of the forearm and bending of the wrist. The condition is also called tennis elbow or golfer's elbow.

Thoracic Outlet Syndrome - a compression of nerves and blood vessels between the first rib, clavicle (collar bone), and accompanying muscles as they leave the thorax (chest) and enter the shoulder.

Cervical Radiculopathy - a compression of the nerve roots in the neck.

Ulnar Nerve Entrapment - a compression of the ulnar nerve in the wrist.

Cumulative trauma disorders can also result from activities other than work which involve repetitive motion or sustained awkward positions such as sports or hobbies. Work and non-work activities may together contribute to, aggravate, or accelerate the development of cumulative trauma disorders. This can make it difficult to determine the main cause of CTD in a person. These disorders can also be aggravated by medical conditions such as renal disease, diabetes, rheumatoid arthritis, gout, multiple myeloma, thyroid disorders, amyloid disease and pregnancy.

WHAT ARE THE SYMPTOMS OF CUMULATIVE TRAUMA DISORDERS?

- * Numbness
- * Swelling
- * Pain
- * Redness
- * Tingling
- * Aching
- * Decreased Joint Motion
- * Burning
- * Weakness
- * Clumsiness
- * Cracking or popping of joints

The above symptoms may involve the upper and lower back, shoulders, elbows, wrists, or fingers. If symptoms last for at least one week, or if they occur on many occasions, a doctor should be consulted.

HOW ARE CUMULATIVE TRAUMA DISORDERS TREATED?

Usually the best treatment for CTDs is rest from the activities that caused the problem, or a change in work practices. It is important that a doctor be seen as soon as the early symptoms of a CTD are recognized. This is because treatment is more successful if the disorder is diagnosed early. The doctor may send you to another doctor who specializes in the nervous system (neurologist) or muscular treatments (physical medicine and rehabilitation) for further tests and treatment.

Medical treatment will vary for each type of CTD. The doctor may prescribe one or more of the following treatments:

- Wrist splint to keep wrist from bending
- Cold and hot baths

- Anti-inflammatory medications
- Steroid injections
- Physical and/or occupational therapy
- Surgery in advanced cases

It is important to remember that each individual and each injury is different. Always see a doctor before taking any medication or starting any therapy on your own. If the disorder is work-related, then the job or work station may also have to be changed. Otherwise, even after successful treatment, the same problems can occur again.

HOW ARE CUMULATIVE TRAUMA DISORDERS PREVENTED?

Posture For VDT Work

Your body posture determines which muscles and joints are used in carrying out an activity. Careful positioning of the body at the video display terminal (VDT) can reduce the likelihood of injury. In some cases, furniture may have to be readjusted or replaced in order to allow for good working postures:

- Wrists should be in a neutral position, that is not bent up or down. Bent wrists can lead to Carpal Tunnel Syndrome.
- Use the least amount of pressure when striking the keys.
- Feet should rest flat on the floor, if not, a foot rest should be used to relieve pressure on the lower back. Dangling legs also add pressure to the thighs which could cut off blood flow to the legs.
- The head should face forward with a slight downward tilt in order to put the least demand on the neck and shoulders. The center of the visual display screen should be between 15-20 degrees below horizontal eye level to achieve the downward tilt of the head.
- The forearm should not be raised too much (elbow angle should be almost a right angle, or within a 70-135 degree range) to avoid neck and shoulder pain.

- The mouse should be placed by the user's side, close to the body, and at the same level as the keyboard to prevent stress in the shoulders and arms.
- The body should not be twisted. The material being worked on should be placed near the typewriter or video display terminal to reduce twisting which may damage the back. It will also reduce extended reaching, which can strain the back and shoulders.
- Support the lower back and rest it by using the backrest frequently and by supporting the arms.
- Ensure adequate clearance for thighs and feet by keeping areas under the desk and keyboard clear, and by using desks or tables that are high enough. Free movement is important for supporting the back and for circulation in the legs.
- Do not stay in one working posture. Shift positions so muscles are not tensed in the same position for too long.
- Take breaks from VDT work, as described under the "Job Design" section of the "Video Display Terminal Guidelines" developed by New Jersey Department of Health and Senior Services, Public Employees Occupational Safety and Health Program.
- Chairs should be upholstered.
- Chair backrests should have lumbar support which is adjustable in height.
- Chairs should have 5 legs and the ability to swivel.
- VDT monitors should tilt and swivel.
- VDT monitors should be positioned and lighting should be adjusted to avoid glare and eye strain, which may force the operator into awkward postures.
- VDT tables should be height-adjustable.
- Soft wristrests should be available.
- Document holders should be available and placed at about the same eye level as the VDT monitor.
- Adjustable foot rests should be available if requested.

Retrofit existing furniture, if it is not adjustable, so that preferred postures can be achieved.

- Some equipment that can be purchased from office furniture dealers includes adjustable, attachable keyboard and mouse trays, adjustable arms or caddies to hold the monitor, short arm rests that can be attached to a chair, cushions for lower back support, and Central Processing Unit (CPU) holders which fit under a desk.
- Use books to raise the height of a monitor; lower the monitor by taking it off the CPU.
- Use a foot rest with chairs that cannot be adjusted to prevent dangling legs.

Furniture

Office furniture should be designed or modified so that the postures described above can be achieved. For new furniture, detailed specification of chairs, desks, and VDT equipment are listed in the PEOSH VDT Guidelines. Below are some of the key features mentioned in the VDT Guidelines:

- Chairs should be easily adjustable without tools.
- Chairs need to be sufficiently wide and deep.
- Chair heights should be adjustable.
- Chair seat should tilt back and slightly forward.
- Chair seat edges should be rounded (sometimes referred to as water fall).

Exercises for VDT Operators

Certain exercises that can be done at the work station have been devised to help relieve physical stress and strain. These exercises do not substitute for a well-designed work station or a prescribed form of therapy. Consult a physician before beginning to exercise.

Exercise 1 -- Deep Breathing for Overall Relaxation

Inhale through your nose and exhale through your mouth. Repeat 6 times.

Exercise 2 -- Relief of Hand and Finger Tension

Make a tight fist with your hands. Hold for a second and then spread fingers apart as far as you can. Hold for 5 seconds. Repeat 4 times.

Exercise 3 -- Relief of Hand and Wrist Tension

Hold hands in front of you. Raise and lower hands to stretch muscles in the forearm. Repeat 6 times.

Exercise 4 -- Relief of Shoulder Tightness

Raise arms to the sides with elbows straight. Slowly rotate arms in small forward circles. Lower arms. Repeat twice.

Exercise 5 -- Relief of a Stiff Neck

Turn your head slowly from one side to the other. Hold each turn to the count of three. Repeat motion 5 times in each direction.

Exercise 6 -- Relief of Arm Tension

Raise your arms over your head, stretching as high as you can. Hold for three seconds. Then bring your arms down. Rest a moment and then repeat 3 times.

Exercise 7 -- Relief of Shoulder and Back Tension

Raise your hands to shoulders. Keep elbows down. Using arms, push back the shoulders. Hold for 10 seconds and repeat 3 times.

Exercise 8 -- Relief of Lower Back Tension

While sitting, lower your head and slowly roll your body as far forward as you can toward your knees. Hold for 10 seconds. Push yourself up with your leg muscles. Repeat 3 times.

(Caution: Be sure that your chair is stable and does not roll while you are bending).

Exercise 9 -- Relief of Cramping and Tightness in Legs

While sitting, grasp the shin on one leg and pull toward your chest. Hold for 5 seconds. Then do the other leg. Repeat 3 times.

Exercise 10 -- Relief of Eye Fatigue

Roll your eyeballs around clockwise three times, then counterclockwise three times.

Off-Work Activities

Workers who suffer from an occupational CTD should limit the activities they do outside of work that could aggravate the injury. For example, certain hobbies or household chores may aggravate some disorders.

WHAT DOES THE LAW SAY ABOUT CUMULATIVE TRAUMA DISORDERS?

All workers in New Jersey are covered by laws that entitle them to a safe and healthful workplace. Private sector and federal employees are covered by the federal Occupational Safety and Health (OSH) Act and state, county, municipal and public school employees are covered by the New Jersey Public Employees Occupational Safety and Health Act. The agencies that enforce these laws are listed under "Resources." Neither the Occupational Safety and Health Administration (OSHA) nor New Jersey's PEOSH Program have specific standards for office design or VDTs. There are, however, certain requirements in both laws that relate to CTDs in office workers.

Recordkeeping

Employers are required to keep a log (NJ OSH 300 Log) of occupational illnesses and injuries during the year, including CTDs. The log is available to employees and the annual summary (NJ OSH 300A Form) must be posted during the months of February through April of the following year.

A CTD is considered an "illness" and, therefore, must be recorded on the NJ OSH 300 Log, if the following conditions exist:

- It is work-related; i.e., work either causes, contributes to, or aggravates symptoms, and

- It is a new case, and
- The CTD results in one or more of the following actions:
 - 1) days away from work,
 - 2) restricted work, or transfer to another job, or
 - 3) medical treatment beyond first aid.

A case is considered complete once the signs and symptoms are gone. If symptoms recur later, then a new listing of the CTD must be recorded on the NJ OSH 300 Log. Judgement of whether an employee has recovered completely will be based on the passage of time since the symptoms last occurred and the physical appearance of the affected area. For additional guidance refer to 29 CFR 1904, OSHA's recordkeeping rule which New Jersey adopted by reference September 4, 2001.

Exceptions to this rule are back injuries. To avoid confusion, they are considered "injuries" even if they result from repetitive motion or awkward postures. Back injuries must be recorded if they require medical treatment, work restrictions, or a job transfer.

General Duty of the Employer

The PEOSH Act contains a "general duty clause" which requires the employer to keep the workplace free from recognized hazards. For workplaces where VDT operators have CTDs, PEOSH has issued orders to comply and has required an ergonomics program, including the selection of adjustable furniture.

WHAT SHOULD EMPLOYERS DO?

Ergonomics Committee

Ergonomics, the study of fitting workplace conditions and job demands to the workforce, helps to make the job fit the worker rather than forcing the worker to fit the job. Involvement of the workers is key to the success of any ergonomics program. Workers should be informed of and participate in all of the activities listed below, from the selection of the responsible personnel to the implementation and evaluation of any changes made. This can be achieved through a new or existing joint labor/management

health and safety committee, a subcommittee, or a new ergonomics committee. The PEOSH booklet "Guide to Effective Joint Labor/Management Safety and Health Committees," and the information bulletin, "Joint Labor/Management Safety and Health Committees", available from the New Jersey Department of Health and Senior Services PEOSH Program, provide guidance on the structure and operation of these committees.

Worksite Evaluation

The first thing employers and/or the Ergonomics Committee should do is determine if there is a potential for CTDs. One person (or the Ergonomics Committee) in each organization should be assigned responsibility for making this determination and implementing any necessary changes. This person does not necessarily have to have expertise in occupational health. They should, however, be able to follow the VDT Guidelines. The New Jersey Department of Health and Senior Services PEOSH Program Consultation Project is available to provide free, confidential service and technical assistance with the interpretation of the VDT Guidelines and other PEOSH Standards. An employer may hire an outside consultant to do the evaluation and assist in implementation of changes. If so, the consultant should be an industrial hygienist, occupational health nurse or physician, with some experience in implementing similar programs. Be sure to ask for and check references. The PEOSH Program can provide a list of local industrial hygiene consultants.

The worksite evaluation should include all or most of these elements:

- A review of injury and illness records (NJ OSH 300 Log) to identify employees or work areas that need attention.
- Interviews with employees and observation of their work stations and practices to determine which workers have the potential for developing CTDs and which workers' stations comply with the PEOSH VDT Guidelines. Photography or videotaping may be helpful. A sample workstation checklist can be found in Appendix G in the PEOSH VDT Guidelines.

- Administration of a questionnaire to employees to identify which employees or work areas need attention and in what priority order they exist (a sample questionnaire can be obtained from the New Jersey Department of Health and Senior Services PEOSH Program).
- Measurements to determine whether specifications in the PEOSH VDT Guidelines for chairs and tables are met (the checklist in Appendix E of the document can be used).

The worksite evaluation should result in recommendations stating who should receive training, new furniture, or reassignments, and in what priority. Priority should be given to workers who have symptoms, who work long hours (4 or more hours per day) on VDTs, or who do particularly tedious or demanding work.

Furniture

See the discussion of furniture under “How Are Cumulative Trauma Disorders Prevented.”

Training

It is essential to train workers on what postures prevent CTDs, on the importance of taking breaks and exercising, and on how to adjust furniture. Supervisors also need to be aware of these subjects. The PEOSH VDT Guidelines provide a brief discussion and an outline of training programs for both managers and VDT operators. Trainers should be thoroughly familiar with, and understand, the PEOSH VDT Guidelines. Additional information on CTDs can be obtained from OSHA and National Institute for Occupational Safety and Health (NIOSH).

Job Design

Operator input should be included as much as possible in decisions about workstation design and workload. Schedules should allow for at least a 15 minute break every two hours. Shorter breaks (from one to a few minutes) should be permitted as needed.

It is recognized that many organizations operate under the constraints of formal job specifications or formal contract language. To the maximum extent possible within these constraints, no employee should be assigned to

continuous high demand VDT work for more than 4 hours per day. High demand work is work that requires constant, rapid, muscular action or fixed positions for extended periods of time, or that is highly repetitive or boring. Machine-paced work and electronic surveillance can be especially stressful if the workload is increased at the same time that a worker’s control over their job is decreased. The PEOSH VDT Guidelines contain recommendations for computer monitoring (see Appendix A).

WHAT SHOULD WORKERS DO?

Ergonomics Committee

Workers should get involved in decisions to evaluate and change their equipment and work practices. This could be done through an existing joint labor/management safety and health committee or by forming an ergonomics committee. If it is not possible to join or form a committee, workers can have input through their supervisors or employee representatives.

Union Programs

Some unions have programs which are focused on CTDs or on safety and health. Many offer training programs and educational materials on office hazards.

Workers’ Compensation

A worker suffering from a job-related injury or occupational disease is entitled to certain benefits under the New Jersey Workers’ Compensation Act. Some of these benefits may include:

- Medical treatment
- Temporary compensation while unable to work
- Permanent disability for workers unable to resume any type of work
- Partial permanent disability for workers able to work but with some lasting effect from the injury or disease

The worker's compensation system is a "no-fault" system. A worker may file a claim if they believe their injury or illness is job-related. After the claim is filed, an employer or their insurance carrier may contest it. A final determination is made by a judge of compensation.

For more information, including time limitations, about the workers' compensation law in New Jersey contact the New Jersey State Department of Labor or Rutgers Labor Education Center (see next page).

RESOURCES

Organizations

New Jersey Public Employees Occupational Safety and Health (PEOSH) Program

New Jersey Dept. of Health & Senior Services
PO Box 360
Trenton, NJ 08625-0360
(609) 984-1863
<http://www.state.nj.us/health/eoh/peoshweb>

Contact the PEOSH Program for information about workplace health regulations, to file a complaint about working conditions, or to request technical assistance from the PEOSH Consultation Project if you are a New Jersey state, county, municipal or public school employee. The PEOSH Program has informational materials as well as a complaint form and consultation request form available on the website. Additionally, the Education and Training Project can assist you by providing free on-site occupational health training to better understand and implement the requirements of health standards.

New Jersey State Department of Labor

Division of Workers' Compensation
PO Box 381
Trenton, NJ 08625-0381
(609) 292-2516
<http://www.nj.gov/labor/wc/wcindex.html>

Workers who have been injured or become sick from their job are entitled to Worker's Compensation to cover lost wages and medical expenses.

Labor Education Center

Rutgers, The State University of New Jersey
Ryderson Lane and Clifton Avenue
New Brunswick, NJ 08903
(732) 932-9502 and 932-9505
<http://web.rutgers.edu/rulabor>

Distributes a helpful booklet entitled *A Workers Guide to the New Jersey Workers' Compensation Law*.

PhilaPOSH

Philadelphia Area Project on Occupational Safety and Health
3001 Walnut Street, 5th Floor
Philadelphia, PA 19104
(215) 386-7000
<http://www.philaposh.org>

Serves South and Central New Jersey.

NYCOSH

New York Committee on Occupational Safety and Health
275 Seventh Avenue, 8th Floor
New York, NY 10001
(212) 627-3900
<http://www.nycosh.org>

Serves Northern New Jersey.

PhilaPOSH and NYCOSH provide educational materials on job health and safety and referrals.

Occupational Safety and Health Administration (OSHA)

<http://www.osha.gov>

Contact OSHA for information about workplace health and safety regulations or to file a complaint about working conditions if you work in the private sector.

The local office is in the telephone directory under U.S. Department of Labor, Occupational Safety and Health Administration.

National Institute for Occupational Safety and Health (NIOSH)

Technical Information Center
4676 Columbia Parkway
Cincinnati, OH 45226
1-800-35NIOSH
<http://www.cdc.gov/niosh>

Provides free literature searches and free information packages on a large variety of work-related issues, including cumulative trauma disorders.

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CUMULATIVE TRAUMA DISORDERS IN OFFICE WORKERS**

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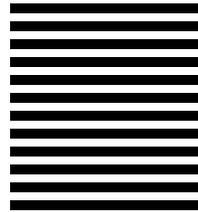
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