

CUMULATIVE TRAUMA DISORDER CONTROL PROGRAM

Cumulative trauma disorders of the arm and wrist, such as carpal tunnel syndrome, tendinitis, tenosynovitis, and bursitis, are a major source of workers' compensation injuries. Up to 25 percent of the work force in job classifications requiring intense hand motions will require medical attention due to these injuries.

These disorders are caused by repeated physical exertion to the hands and wrists due to improper postures (positioning) and excessive pressure being extended. This results in injuries to the tendons, tendon sheaths, nerves, and muscles.

PROGRAM ORGANIZATION

A control program for cumulative trauma disorders can reduce the frequency and severity of these disorders. This program should be administered by a suitably trained individual. Many departments within the company will eventually be involved in the process, which may necessitate the formation of a committee to manage the program. Committee members should come from management, labor, engineering and safety. Individuals within the committees can be delegated specific responsibilities within the control program.

PROGRAM IMPLEMENTATION

Accident/job Analysis

An analysis of cumulative trauma disorders in the plant must be made to identify problem areas. Typically, the information for accident analysis comes from first aid records, OSHA logs, first reports of injury, or insurance carrier loss runs. Additionally, health insurance records should be analyzed since many cumulative trauma disorder incidences may not be reported as an occupational injury.

The results of this analysis should provide a list of departments and jobs that have had an incidence of cumulative trauma disorders. Each job should then be reviewed and evaluated to identify those risk factors which contribute to the disorders.

A typical job analysis consists of listing the actions of each hand in a job sequence, then evaluating each action for the occurrence of any of the risk factors associated with cumulative trauma disorders. If there are industrial engineers on the staff, they should be responsible for this phase of the program.

Risk factors include:

1. Repetitive or sustained exertion
2. Poor posture (positioning)
 - a. Shoulder: Elbow above mid-torso; reaching down and behind torso
 - b. Forearm: Inward or outward rotation with a bent wrist
 - c. Wrist: Wrist extension more than 30°; bent upwards or downwards, or to the sides
 - d. Hand: Pinching
3. Mechanical pressure/stress on palm of hand and fingers
4. Vibrating tool use
5. Exposure to cold
6. Glove use

Engineering Controls

The most successful controls for cumulative trauma disorders are engineering controls. These controls reduce the risk factors identified in the job analysis which contribute to cumulative trauma disorders. These risk factors can be eliminated through changes in the job, process, or tools. The plant engineering staff must be involved in this process. Some general solutions are:

Sustained Exertion can be reduced by reducing weights of objects or tools, changing size or shapes, and balancing objects held in the hands. Fewer objects can be picked up at one time or objects can be picked up with two hands rather than one handed.

Mechanical Stress Concentrations can usually be controlled by increasing the size of handles, eliminating sharp edges, and using compliant materials. Handles should be as large as will fit comfortably in the hand.

Tools should be selected to minimize flexion on the wrist. As a rule, tools and tasks should be designed so they can be used and performed without deviation or flexion of the wrist. The wrist should be maintained in the same position as if the arm were hanging relaxed at the worker's side. This can be accomplished with angled handles on tools or repositioning the workpiece so that the tool can be operated with the wrist straight (see the attached illustration).

Administrative Controls

Selection- Pre-employment physicals should include tests for early signs of cumulative trauma disorders. For example, there are sample tests that can be administered to demonstrate carpal tunnel

syndrome. These include Phalen's wrist-flexion test, forced wrist-flexion test, examining for Tinel's sign, and electroneuromy-ography.

Job Assignment- Women are much more susceptible to carpal tunnel syndrome, particularly post-menstrual women, women on oral contraceptives, and pregnant women. These high risk employees should avoid the jobs identified as high risk in the jobs analysis.

Job Rotation- Where feasible, employees should be rotated in high risk jobs to minimize the effects of repetitiveness. This would depend on the level of training required in various job classifications.

Training- Employees should be trained in proper operation of tools to minimize the postures and wrist flexion that contribute to cumulative trauma disorders. Employees should also be trained in recognizing early symptoms of carpal tunnel syndrome or other cumulative trauma disorders. This should be done by the supervisor as part of the initial job training. An employee reporting early symptoms should be referred to a physician for evaluation.

PROGRAM EVALUATION

The program will need to regular evaluation to judge its effectiveness. Engineering changes must be an ongoing function, particularly when new operations are begun. Regular reports should be made to top management to apprise them of the effectiveness of the program.