



# Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) have been the largest, single work-related illness and injury problem in the United States for the last decade. Each year roughly 600,000 MSDs are serious enough to be reported to the Bureau of Labor Statistics by general industry employers. These disorders account for 34% of all reported injuries and illnesses and one-third of all workers' compensation costs to employers. Transit workers at risk for work-related musculoskeletal injuries include:

- train and bus operators
- machine operators
- hand tool operators
- materials handlers
- maintenance workers
- clerical workers

## What are Musculoskeletal Disorders?

Work-related musculoskeletal disorders (MSDs) is the name used by the Occupational Safety and Health Administration (OSHA) to describe a type of injury that results from chronic (or long term) overuse or misuse of muscles, tendons, ligaments, joints, cartilage, or spinal discs during work. Other names for work-related MSDs include repetitive strain injuries (RSIs) and cumulative trauma disorders (CTDs). Unlike strains and sprains, which usually result from a single incident, MSDs develop over time.

Work-related MSDs may be caused by any combination of the following conditions. Joint disease, gout, diabetes, pregnancy, or the use of oral contraceptives may increase the risk of MSDs. Outside activities such as athletics or hobbies can also aggravate work-related MSDs.

### Repetition

Workers performing the same motions over and over.

### Awkward or Fixed Posture

Workers performing their assigned tasks in an awkward position or holding the same position for a long time. For example, sitting in a small, non-adjustable driver's seat.

### Forceful Movement

Workers exerting excessive force while lifting, pulling, pushing, twisting, or gripping a tool or object.

### Vibration

Workers exposed to motion from power or pneumatic tools and equipment or vehicle movement.

### Contact Pressure

Workers exerting direct pressure on soft tissues. For example, tool handles that are too short or have ridges that dig into the palm of the hand, sharp table edges that dig into the wrists, or sharp seat edges that dig into the backs of the legs.

### Insufficient Recovery Time

Workers on-duty for long periods without adequate rest breaks.

### Working in Cold Environments

Individuals working in temperatures below 15°C (59°F). At this temperature blood flow to and from the extremities is reduced decreasing muscle strength and dexterity and leading to increased risk of injury.

### Stress

Workers stressed due to such things as fast work pace, lack of control over work or circumstances outside of work.

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## What are the Effects of Musculoskeletal Disorders?

One or more of these symptoms will be present in the injured area:

- pain
- swelling
- numbness or tingling
- tenderness
- spasms
- weakness
- loss of joint mobility
- loss of coordination

These symptoms can occur during or after work. They may be mild or can be so intense that they interfere with the performance of everyday tasks like fastening a button or turning a doorknob. The more frequent and intense the symptoms, the more serious the injury is likely to be. If symptoms persist, proper medical attention is needed.

Certain types of doctors, such as occupational physicians, neurologists, orthopedists, and physiatrists (rehabilitation specialists), are often familiar with work-related musculoskeletal disorders. These are the appropriate professionals to diagnose work-related injuries and support workers' compensation claims.

Work-related musculoskeletal disorders most often occur in the fingers, hands, wrists, elbows, arms, shoulders, back, and neck. There are many types of MSDs, including:

### Carpal Tunnel Syndrome

This is the inflammation of the nerves in the wrist, hand, and fingers. It is caused by repeated bending of the wrist, holding tools or material tightly, or constantly pressing the wrist against a hard object, thus compressing the nerve.

### Raynaud's Syndrome

This is also known as hand-arm vibration syndrome or white finger disease. It is a disorder of the blood vessels, usually in the fingers or hands, often caused by the use of vibrating hand tools.

### Tendinitis

This is inflammation of a tendon or the sheath that surrounds a tendon. It is caused by repeated movement of a joint. Tendinitis problems include:

- tenosynovitis (wrist)
- trigger finger (palm side of any finger other than the thumb)
- DeQuervain's Disease (tendons in the wrist controlling the thumb)
- epicondylitis which includes tennis elbow (pain outside the elbow bend) and golfer's elbow (pain inside the elbow bend)
- rotator cuff tendinitis (shoulder or upper arm)

### Thoracic Outlet Syndrome

This is a disorder of the nerves and blood vessels in the shoulder. It is caused by overhead work or by carrying heavy items with the arms straight down.

### Low Back Pain

Low back pain can result from repeated or incorrect lifting, pushing, pulling, twisting, bending, stooping, or reaching.

## What Can Be Done To Prevent Musculoskeletal Disorders?

Workplace conditions that result in musculoskeletal disorders can be corrected through the use of **ergonomics**. Ergonomics is the science by which workplace conditions and job demands are fitted to the capabilities of the individual worker, rather than making the worker fit the job. Since people come in all shapes and sizes, this means designing or redesigning

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tools, equipment, workstations, and job tasks to prevent discomfort or injury.

Many employers have successfully used ergonomic programs as a cost-effective way to prevent or reduce work-related MSDs, keep workers on the job, and boost productivity and workplace morale.

Changes can be made in:

### **Work Station Design**

This includes making such things as the position and height of seats, work surfaces, and equipment controls adjustable; supporting seating and standing positions; and using mechanical lifts for lifting or moving heavy objects.

### **Tool Selection and Design**

Tool size, shape, and forces needed are important factors in the prevention of MSDs. Tools requiring minimal grip and maximal comfort will reduce injuries. Evaluate the shape, length, grip thickness, hand span (for tools such as pliers), grip surface and texture, and weight and balance (especially for power tools) of tools. Use vibrating tools such as pneumatic hammers that are designed so that the cold air backblast does not pass over the hands. Thick handle surfaces also dampen the vibration without increasing grip strength requirements.

### **Work Task Design**

Jobs can be redesigned to permit frequent rest breaks and to minimize repetitive tasks.

## **What Are the Legal Requirements and Professional Guidelines for Preventing Musculoskeletal Disorders?**

Federal occupational safety and health laws cover transit workers employed by private companies. On November 14th, 2000, OSHA issued its final ergonomics

rule (29 CFR Part 1910.900). The standard takes effect on January 16, 2001. Employers will have until October 2001 to comply. The standard applies to most categories of employers covered by federal OSHA. Exceptions include railroad operations and office management and support services directly related to the operation of a railroad and employers who are covered by OSHA standards for construction.

An employee reporting an MSD sets employer responsibilities under this standard in motion. If the injury meets criteria set forth by OSHA, the employer must determine whether magnitude, duration, or intensity of the risk factors in the employee's job exceed the standard's "action trigger". Risk factors include: repetition, awkward posture, force, vibration and contact stress. The employer must implement an ergonomics program if the risk factors exceed the trigger.

OSHA requires that the ergonomics program include the following elements:

- management leadership and employee participation
- job hazard analysis
- using feasible engineering, work practice and administrative controls to eliminate or reduce MSDs.
- initial training and follow-up training at least every three years in a language understandable to workers
- medical care and work restrictions for injured employees
- maintaining records of employee reports and employer responses and compliance-related activities

Transit workers employed by government-owned transit systems or by public authorities may be covered by state OSHA plans. Some state OSHA plans have their own ergonomic standard.

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