MUSCULOSKELETAL DISORDERS

Musculoskeletal injuries, known as musculoskeletal disorders (MSDs) by the specialists who study and treat them, involve the nerves, tendons, muscles, and supporting structures of the body. Carpal tunnel syndrome and lower back pain are the most common injuries, but there are at least 10 other MSDs that affect thousands of people each year.

MSDs and Work

MSDs were recognized as resulting primarily from work as early as the beginning of the 18th century, but most of the literature addressing these disorders dates back only 30 years. The only routinely collected data about occupational injuries sustained by U.S. workers is the Annual Survey of Occupational Injuries and Illnesses conducted by the Bureau of Labor Statistics of the U.S. Department of Labor. Although the data has fluctuated from year to year, a dramatic 1,000% increase in MSDs occurred over the 14-year period from 1984 to 1998.

U.S. Department of Labor
www.bls.gov/datahome.

Since 1998, more than 1.8 million work-related cases of MSD have occurred and 600,000 of those cases resulted in loss of time from work; and twice as many more affected workers but did not result in loss of work time. About 70% of MSDs are attributable to repetitive motion and 30% to lifting.

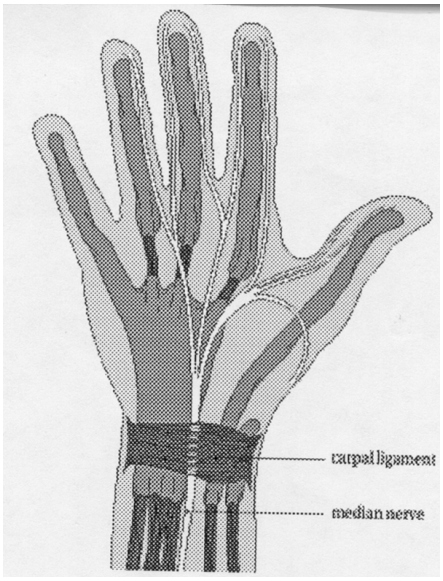
OSHA has estimated that U.S. businesses spend in excess of $15 billion each year in workers' compensation claims for work-related MSDs, and total costs for these disorders may be as high as $60 billion per year. OSHA estimates that an average of $22,500 in direct costs can be saved for each work-related MSD. The figure is high because 42% of carpal tunnel cases result in more than 30 days away from work; the medium number of days lost is 27.

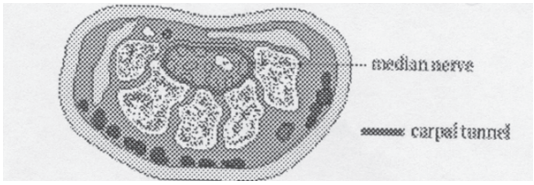
Go to www.osha-slc.gov for OSHA information.

Types of MSDs

Eleven types of MSDs occur in the workplace with great enough frequency to warrant consideration:

Carpal tunnel syndrome is the most serious MSD that people working in offices and libraries are likely to encounter. *Carpal* is derived from the Greek word *karpov,* which means *wrist*. The wrist is surrounded by a band of fibrous tissues that normally functions as support for the joint. The tight space between this band and the wrist bone is called the carpal tunnel. The median nerve passes through the carpal tunnel to reach the thumb, index, and middle fingers of the hand. Any condition that causes swelling or a change in position of the tissue within the carpal tunnel can squeeze and irritate the median nerve. Irritation of the median nerve causes tingling and numbness of the thumb, index, and the middle fingers, a condition known as carpal tunnel syndrome.





Two views of the carpal tunnel and median nerve.

Although obesity, pregnancy, diabetes, arthritis, and trauma can lead to carpal tunnel syndrome, inflammation from repetitive work, such as uninterrupted typing, is the most common cause.

The initial symptom of carpal tunnel syndrome is a numbness and tingling of the hand or the fingers. These sensations are often more pronounced at night. As the condition progresses, the symptoms include a burning sensation, cramping, and a weakness of the hand. Occasionally, sharp, shooting pains can be felt in the forearm.

A common diagnostic technique is to tap the front of the wrist. If this tapping reproduces the tingling of the hand, and is referred to as the Tinel's sign of carpal tunnel syndrome. Symptoms can often be reproduced by bending the wrist forward, referred to as Phalen's maneuver.

A medical doctor usually will examine the neck, shoulder, elbow, and reflexes to exclude other conditions that can mimic carpal tunnel syndrome.

The most common treatments are temporarily discontinuing the repetitive activity, anti-inflammatories, and special exercises, but surgery is often required. When surgery is performed, recovery usually takes more than a month.

Rotary cuff syndrome is a tear in one of the four muscles that control the rotating of the shoulder. Lifting too much or lifting incorrectly is the most common cause of rotary cuff syndrome. Repetitive motion, especially overhead motion, is another cause. Although far less common than carpal tunnel syndrome in offices and libraries, rotator cuff syndrome does affect workers who shift armloads of books to upper or lower shelves, lift and stack cartons of books, lift and install book shelving, and work with difficult-to-handle objects.

The primary symptom is pain on top and in the front of the shoulder, with the pain greatest when reaching up above the level of the shoulder. Other symptoms include weakness and stiffness in the shoulder, a mild popping sensation in the shoulder, and discomfort when trying to sleep on the shoulder.

The most common diagnosis is made by observing the motion of the shoulder. Sometimes a magnetic resonance image (MRI) is ordered. An MRI can show with great detail the rotator cuff tendon and where it is torn.

Over-the-counter medications, avoiding overhead motion, and special

exercises usually take care of the problem within a month. If not, rotator cuff repair surgery may be needed to reattach the torn tendon.

De Quervain's disease is a painful disorder affecting the tendons at the base of the thumb. These tendons are encased in sleeves through which the tendons slide. The inner wall of each sleeve contains cells that produce a fluid to lubricate the tendons. With repetitive or excessive movements such as hand twisting and forceful gripping, the lubrication system may malfunction, allowing friction to develop between the tendons of the thumb and their sleeve. The condition is becoming more common in offices and libraries as people spend more and more hours daily using a mouse.

The primary symptom of De Quervain's disease is pain when moving the thumb away from the hand. Pain can also occur when twisting the hand. It is not uncommon for the pain to extend to the radial side (same side as the thumb) of the forearm.

The most common treatment of De Quervain's disease is the splinting of the thumb and wrist to avoid the movements that caused the disorder. Physicians usually prescribe anti-inflammatory drugs to reduce the pain. Surgical release is necessary in only a small percentage of cases.

The choice of a mouse is an important factor in avoiding De Quervain's disease.

Trigger finger is a condition affecting the movement of the tendons as they bend the fingers or thumb toward the palm of the hand, the movement called flexion. The tendons that move the fingers are held in place on the bones by a series of ligaments called pulleys. The pulleys form an arch on top of the bone that creates a sort of tunnel for the tendon to run in along the bone. Triggering is the result of a thickening in the tendon. There may be a thickening of the pulley ligament as well.

Triggering is most commonly caused by long hours using pistol gripping power tools or grasping a steering wheel. It is not common in offices and libraries, but it has occurred among library staff involved in bookbinding and repairs.

The symptoms of trigger finger include pain and a funny clicking sensation when the finger or thumb is bent. The diagnosis is usually obvious as the click can be felt. If the condition is allowed to progress, the finger can be locked in a bent position.

The usual solution is surgery. Cortisone injections have been used, but relief is short-lived. The best solution is to avoid the problem by not using pistol gripped tools for more than a few minutes each hour.

Tarsal tunnel syndrome is similar to carpal tunnel syndrome, but affects the posterior tibial nerve in the foot, rather than the wrist. The posterior tibial nerve runs into the foot behind the medial malleolus, the bump on the inside of the ankle. If the nerve is squeezed, a vague pain in the sole of the foot occurs. In more severe cases, the pain is a burning or tingling type. The symptoms are typically made worse by activity and are reduced by rest.

Although tarsal tunnel syndrome is not common in offices and libraries, it does occur. A common cause is holding a foot in an abnormal position for extended periods of time. Limited under-desk space (due to keeping objects such as recycling bins, briefcases, and purses close at hand) may make placing the feet in a natural position difficult: straight out from the body and flat on the floor or on a footrest. Unsuitable shoes worn by people who

stand a great deal can also be a cause of tarsal tunnel syndrome.

The most common diagnosis is made by touching along the course of the nerve to see if that results in increased pain. Tapping the nerve may result in the shooting of electric shocks into the foot, a phenomenon known as Tinel's sign. If more information is needed, a neurological test known as a nerve conduction velocity test is undertaken.

Anti-inflammatory medications and rest are the most common treatments. Orthotics may be suggested. A cortisone injection may also be used to give temporary relief. If the symptoms fail to respond to conservative treatments, surgery is undertaken.

Lateral epicondylitis is often called tennis elbow because the backhand swing in tennis is a common activity that can cause the problem. Painting, running a chain saw, or using any one of a number of common hand tools can also result in lateral epicondylitis when the muscles of the arm are overused. Less common overall, but a more common movement in offices and libraries, is bending the wrist back (extension), turning the hand palm side up, and lifting an object with the elbow straight.

The symptoms of lateral epicondylitis include tenderness and pain at an elbow. Pain may spread down the forearm, with soreness felt in the forearm muscles. Activities like grasping can intensify the pain.

Tendinitis and bursitis are inflammations of the tendons and bursae respectively. Tendons are the thick fibrous cords that attach muscles to bone. They transmit the power generated by a muscle contraction to move a bone. Bursae are small sacs located between bone and other moving structures such as muscles, skin, or tendons. They allow smooth gliding between these structures.

People—and especially older people—commonly mistake tendinitis and bursitis for arthritis because both tendons and bursae are located near joints. The pain and stiffness feel the same, and are often more prominent at night.

The most common cause of tendinitis and bursitis are injury and overuse during work or recreational activity. Regularly using a limb in an awkward position and poor posture are less obvious, but fairly common, causes. Workers in offices and libraries who do not exercise regularly are almost certain to experience tendinitis or bursitis at some time.

Most cases of tendinitis and bursitis are self-limited, meaning that they go away in two to four weeks without the assistance of a doctor. If the condition lasts longer than four weeks or is recurring, a medical examination is warranted. X-rays may be used to exclude bone abnormalities or arthritis. Blood tests may also be ordered to rule out a number of other conditions. The most important aspect of an examination, however, is a detailed medical history and observation of posture and general physical condition.

If an infection is present, an appropriate antibiotic is necessary, but even more important is improving body conditioning and making sure that the person has an ergonomically correct workstation at his or her place of employment.

Raynaud's phenomenon is a disorder of blood circulation in the finger. This disorder is most commonly caused by a combination of hand-arm vibration in using tools and exposure to cold. Why it occurs is not well understood, but it is related to the fact that the body conserves heat by

reducing blood circulation to the extremities when necessary to keep the rest of the body warm. The disorder is not common among office and library workers. The only cases that have been identified involve staff assigned to the shoveling of snow.

The symptoms of Raynaud's phenomenon are a tingling and slight loss of feeling or numbness in the fingers and blanching or whiteness of the fingers. The thumb is rarely affected. Many laboratory tests can confirm the presence of the disorder.

The most common treatment is to protect the body from cold temperatures.

Carpet layer's knee is an inflammation or fluid buildup in the knee. It is caused by frequent kneeling on hard surfaces and the use of the knee kicker for stretching wall-to-wall carpeting. The condition is common among carpet layers, tile setters, and floor installers, but rare among office and library workers.

Lower back pain is a common MSD in almost all work settings. It affects 80% of workers at some time in their careers, but the majority of such pain does not lead to time away from work, which results in it not taken as seriously as it should be. Although severe lower back pain is often attributed to a herniated spinal disc, it can also be caused by muscle strains, tumors, infections, and fractures.

Much lower back pain is nonspecific, meaning that no particular problem can be identified. The customary diagnostic approach is to rule out serious underlying conditions such as tumors, infections, and fractures. In the absence of these conditions, no further testing is usually done for one month because most lower back pain goes away within that time frame.

Oral medications such as acetaminophen (Tylenol) are usually recommended, as are muscle relaxants such as benzodiazepines. Aspirin and other nonsteroidal anti-inflammatory drugs are not recommended as they are less effective and can cause gastrointestinal irritation. Medical panels have concluded that ice, heat, massage, ultrasound, and acupuncture are not effective in most cases, although they may make the person feel better briefly. Bed rest is effective for up to three days, but it may lead to further debilitation if prolonged for four or more days.

The most effective treatment of all is to avoid lifting and prolonged sitting, and to return to normal activity only gradually two to four weeks after first experiencing the pain.

If the person experiences no improvement after one month, extensive medical diagnostic procedures should be followed, including x-rays, computer-assisted tomography (CAT scan), or MRI.

The best way to deal with lower back pain is prevention. Maintain a good posture, learn how to lift objects, and exercise regularly with exercises designed to strengthen the back.

Herniated spinal disc, one of the serious types of lower back pain, is the partial slipping of the cushions between the discs, or bones, of the back. The spine contains multiple discs called vertebrae. In the upper part of the back, in the neck area, the discs are called cervical vertebrae; in the main part of the back, they are called thoracic vertebrae; in the lower tailbone area they are called lumbar vertebrae and sacral vertebrae. The natural cushions that separate these discs can partially slip out (herniate). That happens most often in the lumbar and sacral areas. The slippage will

pinch nearby nerves, causing pain.

Heavy or incorrect lifting is the most common cause of a herniated spinal disc. Heavy lifting is anything more than 50 pounds; incorrect lifting can cause a problem even if the object being lifted weighs as little as 20 pounds. Workers in the receiving, stacks, binding preparation, and photo duplication areas of offices and libraries are most likely to be affected.

Pain in the back is the most common symptom, but it is not uncommon for the pain to track along the back of one leg, a phenomenon known as sciatica. When the herniation is major, it can be painful to change position or walk.

Options for treating a herniated spinal disc include rest, medications, exercises, and surgery. A relatively new technique involves injecting an enzyme called chymopapain through the skin into the disc to partially digest it. As a result the digested disc puts less pressure on the nerves.