

Ergonomic Hazard Prevention and Control

Industries today are now having to cope with stronger competition and smaller markets. Therefore, operating costs must be reduced in as many areas as possible. To remain competitive, companies must focus on improving process efficiency and increasing safety awareness. Based on statistics, some major operating costs are directly related to occupational health and safety. Although insurance rates, unemployment deductions and workers' compensation costs are rapidly climbing, it's been proven there are methods to control and reduce these costs. One such method involves ergonomics. In the workplace, ergonomics helps adapt the job to fit the person; thus, reducing stress and eliminating many potential injuries and disorders associated with the overuse of muscles, bad posture, and repetitive motion.

Technological advances resulting in more specialized tasks, higher assembly line speeds, and increased repetition in the workplace are often major causes of current ergonomic problems. Employees' hands, wrists, arms, shoulders, backs and legs may encounter thousands of repetitive twisting, forceful or flexing motions during an average workday. Some job tasks expose workers to a lot of vibration and noise, eye strain, repetitive motion, and heavy lifting. It may be a case in which machines, tools and the work environment are not designed properly -- thereby placing stress on workers' tendons, muscles, and nerves. In addition, extreme variations in temperature at a work site may aggravate or increase ergonomic stress. Recognizing ergonomic hazards in the workplace is the first step in improving worker protection. However, before you can begin ergonomic intervention you must first determine the current state of affairs. You can't solve the problems until you know what and where they are.

A variety of musculoskeletal disorders and illnesses are caused by ergonomic stressors. A musculoskeletal disorder or illness is one involving the muscles, tendons, ligaments, nerves, joints, bones, or supporting body tissue. Injuries include disorders of the back, the neck, the upper or lower body extremities, or the shoulders and are associated with strains, sprains, or tissue inflammation, and dislocation.

Environmental hazards include heavy lifting, constant twisting, and repeated motions. Biological hazards are physical characteristics of the worker that vary from person to person, including size, endurance, range of motion, strength and other factors. An injury occurs when the job demand is greater than the physical capabilities of the worker.

Cumulative Trauma Disorders, or CTDs, can be described as musculoskeletal disorders of the upper limbs, such as the head, shoulder, neck, arms, hands and fingers. To give you an example, let's consider two employees who both work at two different companies. One (male) works in an automotive repair shop. His job involves finishing work on equipment pieces with several bolts. To do his job he must constantly use a power wrench to tighten and fit a number of bolts and similar job duties. After several years of doing this same job, he recently began experiencing symptoms of pain and numbness in his fingers. Over a long period of time, hand-held tools requiring excessive force and/or awkward postures can stress the hand, arm or shoulder.

The other employee works in company's office. She spends most of her day doing data entry at a computer terminal. She now has symptoms similar to the automotive shop person. The upper extremities of the human body are a remarkable engineering design and have functional capabilities not likely to be duplicated mechanically. Human joints are connected by a complex ligament-tendon-muscle system that provides a wide range of strength, flexibility and dexterity. However, despite this wonderful range of movement, if certain limitations are exceeded, pain or trauma may result. In fact, both employees are suffering from a cumulative trauma disorder or CTD. Cumulative traumas are not the result of single events or stresses; they stem from the repeated performance of certain tasks that often include forceful movements and usually affect the wrist or elbow. Back problems are by far the most common cumulative trauma injuries because you use your back on everything you do, even if it's standing up all day.

Today, CTDs are recognized as a major occupational health hazard in the workplace and account for the largest share of occupational illnesses known as "repeated trauma disorders." About 20 million workers on assembly lines and in other jobs that require repetitive, strain producing motions are at increased risk of developing such disorders.

Redesigning work stations, equipment, and hand tools can significantly reduce the awkward, forceful movements common to many jobs ranging from assembly lines, in food processing, in the manufacturing industry, and in offices.

While CTDs are a medical disorder and treated as such, ergonomics represents an important factor in treatment and prevention. Simply stated, ergonomic solutions are physical or organizational design changes which reduce risk factors.

Several kinds of ergonomic design changes might be used to reduce the risk factors. One change involves equipment redesign.

These changes would help lower the force required to operate the tool. Another design change can lower the amount of vibration and reduce an additional risk factor. Vibration has been cited as a source in developing CTDs, such as Raynaud's Syndrome, or white finger, which occurs when the blood vessels of the hand are damaged as a result of repeated exposure to vibration for long periods of time. The skin and muscles are unable to get the necessary oxygen from the blood and eventually die. Common symptoms include off and on numbness and tingling in the fingers; skin that turns pale, ashen and cold; and eventual loss of sensation and control in the fingers and hands. This condition gets worse when the hands are exposed to extremely cold temperatures. Nerve, skeletal and joint injuries also occur from too much vibration.

Postural risk factors can be reduced by providing a better workstation, tools, chairs or other equipment. This would allow the employee to move the part, so he does not have to bend over at awkward angles.