

Prevention of Musculoskeletal Disorders (MSD)

How do musculoskeletal disorders (MSD), often called repetitive motion injuries, and sudden or acute trauma injuries differ? Sudden trauma injuries often happen related to a slip or fall on the ground or from a height such as a ladder or rooftop. Sudden trauma can pose injuries ranging from cuts and bruises to fractures, dislocations and



tears in tendons. This can occur not only at work, yet also in sports or hobbies. Knees, ankles and shoulders are particularly susceptible to sudden trauma injuries. Often, tendons may tear or dislocate resulting in injuries that take a long time to heal, and these injuries may involve surgery. Tendons are the connective tissue that connects muscle to bone, whereas ligaments connect bones to bones such as in the bursa capsule or shoulder. Due to the shoulder's large range of motion, it is a rather unstable joint. In order not to stress the shoulder, weight should be kept to a minimum when *reaching upwards*. Also, *it is more and more critical to keep the load near the body as the weight of the load increases*. This could be done with the use of a platform ladder, scaffold or lift that allows access between knuckle and chest high.

- MSDs are the single largest category of workplace injuries and are responsible for almost 30% of all workers' compensation costs. ([source: BLS](#))
- The average MSD comes with a direct cost of almost \$15,000. ([source: BLS](#))

MSD are commonly associated with repetitive motion or cumulative trauma over a prolonged period. The potential for the development of MSD increases as work is done in awkward, non-neutral posture and larger forces are used. Think of a worker placing boxes onto a shelf; requiring that he raise the boxes above shoulder height. For the purposes of preventing MSD, it is best to work between knuckle height and shoulder height. If removing something heavy from a shelf, it is best to grip the load between waist and chest high. For lighter objects, infrequently obtained, it is

acceptable to reach over shoulder height, yet stability may be compromised prompting a fall or dropping the object. Ergonomics is the science of fitting the workplace to the worker, not the other way around. For workplaces or workstations that are used by multiple people of various sizes, there should be much adjustment in the equipment such as keyboard height, chair and lumbar heights, height of the desk surface, and reachability to commonly used devices or controls such as phone, adding machine, etc. Envision a dispatch center that is covered 24/7 or a check in station at a recreation center. In these places, adjustability is key since workers cannot control the volume of calls or the frequency of patron visits.

Cumulative trauma can lead to MSD and there are many factors that can affect the severity of such injuries. If there is limited space and one must lift items out of a bin by bending at the waist, this physical condition prompts sustained awkward postures. If these lifts are frequent, and the items heavy, a MSD is likely to occur. It may be good to take a “step back” and see if your workstation could be set up better to avoid awkward postures and possible automation or aids for lifting. Often, the ideal set up is dictated by whether the work being done is detailed and requires focus, or whether the work is simply transferring materials from one place to another. Detailed work is best done sitting or even on a crawler as used by vehicle mechanics under a chassis. Lifts are used that allow a car or a lawn mower to be serviced by a mechanic in a more comfortable position. Work involving a lot of movement such as graffiti removal or meter reading should generally be done in a standing or walking position.

There are several individual risk factors that can contribute to the development of MSD related to cumulative trauma:

- **Poor work practices.** Workers who use poor work practices, body mechanics and lifting techniques are introducing unnecessary risk factors that can contribute to MSD. These poor practices create unnecessary stress on their bodies that increases fatigue and decreases their body’s ability to properly recover.
- **Poor overall health habits.** Workers who smoke, drink excessively, are obese, or exhibit numerous other poor health habits are putting themselves at risk for not only musculoskeletal disorders, but also for other chronic diseases that will shorten their life and health span.
- **Poor rest and recovery.** MSDs develop when fatigue outruns the workers recovery system, causing a musculoskeletal imbalance. Workers who do not get adequate rest and recovery put themselves at higher risk.

- **Poor nutrition, fitness and hydration.** For a country as developed as the United States, an alarming number of people are malnourished, dehydrated and at such a poor level of physical fitness that climbing one flight of stairs puts many people out of breath.

(Adapted from *"The Definition and Causes of Musculoskeletal Disorders (MSDs)"* written by Ergonomics Plus™ www.ergo-plus.com)

CIRSA is able to assist you in determining what operations are most likely to pose a risk to either sudden trauma injuries or cumulative trauma injuries that lead to MSD. We have tools for measuring force and software that simulates resulting joint forces from ankle to shoulder in various postures and material loads. For more information, contact your CIRSA Loss Control Representative.

