

## Office Ergonomics

### ERGONOMICS

The goal of ergonomics in any workplace setting is to enhance human performance by improving the fit between workers and their tools, tasks, and environments. One aspect of ergonomics concentrates on preventing injuries called musculoskeletal disorders or MSDs.

### MUSCULOSKELETAL DISORDERS

An MSD is an injury that affects the muscles, nerves, tendons, ligaments, joints, or bones.

Some examples of MSDs include Carpal Tunnel Syndrome (CTS), Tension Neck Syndrome, muscle strain and sprain, Lateral Epicondylitis (Tennis Elbow), tendonitis, and spinal disc degeneration. These injuries may also be referred to as Cumulative Trauma Disorders (CTDs), Repetitive Strain Injuries (RSI), or Repetitive Motion Injuries (RMI).

MSDs are caused by exposure to a combination of risk factors.

### MSD RISK FACTORS

Risk factors are actions, conditions, or a combination of these that may reduce performance, create discomfort, or lead to an MSD. Risk factors include:

- Awkward posture
- Force

- Repetition
- Duration
- Contact Stress
- Environmental Factors (heat, cold, lighting, noise, vibration)

Personal factors such as age, fitness levels, or certain conditions and diseases can also make some people more susceptible to MSDs than others.

### AWKWARD POSTURE

Awkward posture is a common risk factor in the office environment. Typical examples include cradling the phone between the ear and the shoulder, reaching too far for the mouse, or turning the head to look at a computer screen that is not directly in front of the worker.

### FORCE

A worker may be exposed to forces in the office environment while performing tasks such as lifting a box of paper, striking a keyboard, or using manual staplers or hole punches.

### REPETITION

Repetition is doing the same action over and over. In the office, a worker may use the index finger to click the mouse button 200 times an hour, or reach for the telephone 50 times a day.

### DURATION

Duration is how long someone is exposed to a risk factor, for example if a person does the same or a similar task for eight hours a day. Lengthy periods of

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time in static postures are also a common risk factor in the office environment.

## CONTACT STRESS

Contact stress occurs when hard or sharp edges or surfaces are in contact with the body. In the office, a worker may rest against the sharp edge of a desk, or the knees may bump into a keyboard tray due to inadequate clearance under the desk.

## ENVIRONMENTAL FACTORS

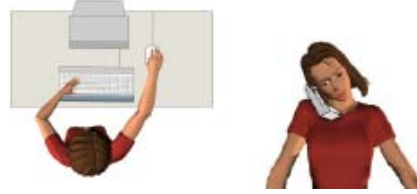
Environmental factors such as lighting, noise, heat and cold can also become risk factors for MSD development. For example, glare on the computer screen may cause both discomfort, and force the worker to adopt an awkward posture to see the screen. Cold air blowing from a vent may decrease performance and cause discomfort. Many tasks will have a combination of these risk factors.

Because every person's body is different and unique, scientists have been unable to find exact exposure levels that will result in an injury. However, in general, the greater the exposure to a risk factor, the greater the likelihood of injury. Making changes to the workplace set up and work design is a proven way to help prevent these types of injuries.

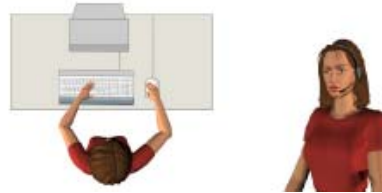
## REDUCING THE RISK

Making a physical change to the work area set up, or the way the work is performed is known as an **engineering control**. Engineering controls are the most effective way to reduce the exposure to a risk factor. For example, a worker may experience awkward postures from cradling the phone or reaching for the mouse. Examples of engineering controls to minimize this risk factor might include eliminating the need to cradle the phone by using a headset, or removing the need to reach for the mouse by moving it closer to the worker. Providing a headset to a worker may also address the risk factor of repetition if the worker had to repeatedly reach for the telephone to answer it.

*Example problem of awkward postures:*



*Example engineering solutions:*



Other examples of common engineering controls include: providing an electric stapler to eliminate the need for high hand force while stapling; rearranging materials and equipment to minimize reach distance; padding sharp edges and ensuring adequate space underneath desks to reduce exposures to contact stresses; and providing a desk lamp to improve lighting.

If engineering controls are not available, **administrative controls** may be used. An administrative control is a change in the way a worker does the work. Example administrative controls include rotating workers or tasks, limiting overtime, or taking micro-breaks.

For example, in a micro-break, a worker takes a very short break from the activity. If a worker is exposed to force or repetition while keying for long periods of time, a micro-break might be a solution. During a micro-break, the worker may focus the eyes on an object far away from the computer screen, move around, or shake out the hands. This should be done often throughout the task.

An administrative control that might limit the duration of exposure to a risk factor could be to control the amount of overtime in a week or to require a certain amount of time off before returning for a second shift.

## CURRENT OFFICE ERGONOMICS GUIDELINES

The most recent office ergonomics guidelines focus on the ability of equipment to physically fit the user and support them while performing tasks. For example, current guidelines recognize four working postures: seated upright, seated reclined (tilted back), seated declined (tilting forward), and standing. The guidelines suggest that equipment such as chairs and desks be adjustable as necessary to support two or three of these postures at a work area.



*Pictured above from left to right: upright, reclined and declined seated postures. Standing postures, not shown here, are also acceptable.*

In addition to suggesting minimally adjustable equipment, guidelines suggest finding the best fitting equipment to begin with. Many manufacturers are recognizing this need and making products in basic sizes. For example, if you have a larger worker, it is now possible to purchase a chair in the size of Large (L) or Extra-Large (XL). Similarly, it is possible to accommodate a worker with very small hands by purchasing a mouse in the size of Small (S), or Extra-Small (XS).

## PRODUCTS FOR THE OFFICE

Currently there are no standards that a product must meet before it can be labeled 'ergonomic'. So, while some products have gone through human centered design and user testing, others may be labeled 'ergonomic' only for marketing reasons.

Good ergonomics means using products that fit the task demands and needs of the worker. What may be an ergonomic solution for one person could at best not function well, or worse, introduce new risk factors to another user.

Product selection should be done on an individual basis. For example, if a worker's task requires them to reference documents repeatedly over the course of the day, a document holder might be a good solution. However, if a worker's task does not require this kind of document reference, a document holder may only clutter the desk area and frustrate the worker.

## SUMMARY

By recognizing and reducing the exposure to MSD risk factors, it is possible to reduce or prevent MSDs in the office environment. Employees should be made aware of these risk factors and have a system in place for reporting and addressing them, such as a workplace-wide ergonomics or MSD prevention program. Employees should also be aware of how to adjust equipment, based on manufacturer guidelines, to best fit their physical and task requirements. (See Zenith poster "You and Your Workstation, The Five Minute Rest Break".)

For more information about ergonomics and an MSD prevention program, see the following Risk Management Bulletins:

- Employer's Guide to Ergonomics
- Elements of an Effective Musculoskeletal Disorder (MSD) Prevention Program

For further information or assistance, contact your Zenith Safety and Health consultant.

Zenith provides workplace safety resources at: [TheZenith.com](http://TheZenith.com)

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