Workstation Ergonomics

Loss Control Bulletin

Office work is rapidly changing. New developments in technology can help make jobs easier, but they can also present new problems for employers and employees. According to OSHA, work-related musculoskeletal disorders (MSDs) account for 34% of all lost workdays reported to the Bureau of Labor Statistics (BLS). MSDs are injuries or pain in the body's joints, ligaments, muscles, nerves, tendons, or structures that support limbs, the neck, or back. Common examples are carpal tunnel syndrome, tendonitis, bursitis, and muscle strains. These disorders now account for one out of every three dollars spend on Workers' Compensation. It is estimated that employers spend as much as $20 billion a year on direct costs for work-related MSDs.

This bulletin will focus on each individual workstation component and what can be done to reduce risks of work-related MSDs.

Desk Height and Space

Correct workstation height will vary depending on the user, but ideally the user will be able to sit at the workstation and easily maintain a 90 to 110 degree elbow angle with straight wrists while typing. Wrist rests should only be used if it actually elevates the wrists. Rests should have a broad, flat, and firm surface design, and the heel of the palm should rest on it, not the wrist. Clearance for the legs under the desk should generally be between 20 and 28 inches high. If footrests are used, clearance must be calculated with the legs in place on the footrest.

Limited space on the work surface may cause users to place devices (e.g., mouse, keyboard) in undesirable positions, which may lead to awkward postures. If document holders are used, they should be at or about the same height and distance away as the monitor screen. The location of frequently used devices should remain within the primary work zone (see figure below).

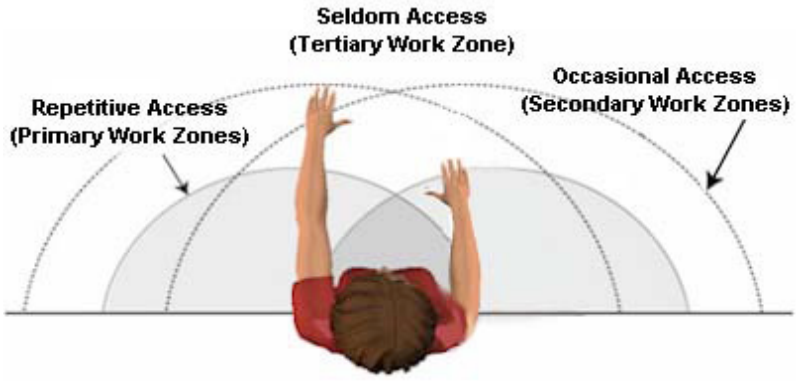

Photo credit: OSHA

Computer Monitors

A major concern with computer monitors is the potential for eyestrain, which is fatigue of the eyes. The recommended computer monitor distance from the user is 20 inches to 40 inches. A good rule of thumb is the monitor should be placed at arms length and positioned directly in front of the user. The top of the monitor should be set at or slightly below (1 to 2 inches) the eye height of the user. Preferably, the screen height should be adjustable to accommodate personal preferences and to avoid glare from lighting.

If two monitors are used, first determine the amount of time each will be used. If both monitors are used an equal amount of time, set them next to each other. The monitors should meet directly in front of the user and be angled in a slight outward "V" shape. If one monitor is used as the primary, position it directly in front of the user, and place the secondary monitor to the right or the left at about a 30-degree angle to the primary monitor.

Keyboard and Mouse

Improper position and height of a keyboard can cause the user to bend their wrists or lift their arms. When a keyboard is properly positioned, the “B” key on the keyboard should be directly in front of the user. The best posture is achieved when a keyboard is below seated elbow height at a negative angle with shoulders relaxed and arms resting at the sides. This position allows the wrists to remain straight while typing. Avoid using a wrist rest while typing as this can cause the wrists to bend, placing unnecessary strain on them. Do not extend the legs on the back of the keyboard, for this causes the wrist to bend upward. A keyboard tray may be needed if the workstation cannot be adjusted. The keyboard tray should be adjustable in height and tilt, provide adequate leg and foot clearance, and have adequate space for a mouse.

The mouse should be kept close to the keyboard and positioned so the user can maintain a straight, neutral wrist posture. If not, stress is placed on the shoulder and arm and increases the likelihood of MSDs. Sensitivity of the mouse itself should be considered because excessive and prolonged force to navigate the mouse can fatigue the muscles of the hand and arm. Ergonomic mice may be used because they are designed to keep the user in a more neutral position, reducing strain and allowing the user to work comfortably.

Chair

A good chair provides necessary support to the back, legs, rear, and arms while reducing the likelihood of awkward postures and forceful exertions. Increased adjustability ensures a better fit for the user and allows variability of sitting positions throughout the work day.

The height of the chair should be set so the upper legs are parallel to the floor, the low back has firm contact with the backrest, and feet are flat on the floor. If the seat cannot be lowered, use a footrest to provide stable support for the feet. The best seated posture is a reclined posture of 100 to 110 degrees. This reclined position decreases the intervertebral disc pressure in the lumbar spine. Armrests should be positioned so they support the lower arm and allow the upper arm to remain close to the torso. Properly adjusted armrests will be:

- Wide enough to allow easy entrance to and exit from the chair
- Close enough to provide support for lower arms while keeping the upper arms close to the body
- Low enough so the shoulders are relaxed during use
- High enough to provide support for lower arms when positioned comfortably at your sides

A chair should have a strong, five-legged base. Chairs with four or fewer legs may provide inadequate support and may be prone to tipping. Ensure that chair caster wheels are appropriate for the type of flooring at the workstation.

Telephone

The telephone should be placed in the primary or secondary work zone (refer to image on page one), depending on how frequently it is used. This will minimize repeated reaching and reduce the possibility of injury. If the user frequently talks on the phone and types or writes at the same time, use a “hands-free” headset so they won’t need to cradle the phone between the head and neck.

Environment

Office lighting can have a considerable effect on both comfort and performance. Bright lights shining on or from behind a computer monitor can make it difficult to clearly see work on the screen. Straining to view images on the screen can lead to eye fatigue. Discuss with building services or a supervisor if the level of brightness is not compatible with computer tasks. Also, consider bright lights from open windows. Computer screens should be placed at right angles to the windows.

Desk, chairs, and other office furniture should not be placed directly under air conditioning and heating vents, unless the vents are designed to redirect the air flow away from these areas. Dry air that is released from these vents can dry the eyes, which can especially affect those who wear contact lenses. It is recommended to keep relative air humidity between 30% and 60%.

Proper office and workstation ergonomics can help employees stay comfortable and healthy at work. Even with an ergonomic workstation, it is important to remind employees to listen to the signals that the body sends. If the shoulders ache, take note of how they are being held while working and make appropriate adjustments. With the help of an ergonomic workstation, habits that could potentially lead to debilitating health problems could possibly be avoided.

Resources

- http://www.thehumansolution.com/ergonomic-office-desk-chair-keyboard-height-calculator.html
- https://www.osha.gov/SLTC/etools/computerworkstations/components_desk.html