

Ergonomic Computer Workstation Survival Guide

Ergonomics is fitting a job or task, workstations and equipment to the individual. Office ergonomics is the awareness of safe computer use, sitting with neutral postures and workstation adjustments to prevent Musculoskeletal Disorders (MSD), Cumulative Trauma Disorders (CTD) (i.e., carpal tunnel syndrome) and Computer Vision Syndrome (CVS). Just as computers have changed the way we work, it is becoming increasingly necessary for us to change the way we operate them and the way we design workstations.

MSD risk factors are conditions that reduce performance, create discomfort or lead to a MSD or CTD. Some examples include:

- Awkward postures – these are fairly common in office environments. Examples include reaching too far for the mouse or turning the head to look at the computer monitor
- Repetition - the same action over and over
- Duration - the same task for long periods during a workday
- Contact stress - hard or sharp edges are in contact with the body
- Environmental Factors - lighting, noise, heat and cold

CVS risk factors include eyestrain, headache, dry and irritated eyes, blurred vision and tired eyes. The causes include:

- Monitor Position - too far away or poorly angled in relation to user's eyes
- Monitor Glare - light reflected can degrade the image
- Inadequate Vision Breaks - constant focusing at the same distance
- Poor Contrast and Brightness on Computer Screen
- Vision Correction – multi-lenses (i.e., bifocals) and out-of-date prescriptions

Reducing the risks of musculoskeletal and vision problems can be accomplished by utilizing the ergonomic potential of the workstation. Furniture, unit design, good posture and proper technique often go hand-in-hand. The following are descriptions of desirable features for furnishings and equipment, their setup and the proper technique to be used with each item.

The Monitor

- Should be placed directly in front of the user
- Should have adjustable height and tilt
- Should have a screen large enough for adequate visibility
- Should be placed so the top of the screen is at or below eye level
- Should be at a comfortable viewing distance (between 18 and 30 inches)
- Should be placed at right angles to windows to reduce glare
- Should be clean and adjusted to the proper brightness and contrast settings

The Keyboard

- Should be placed directly in front of the monitor and at the same level as the pointing device (mouse)
- Should be placed to maintain a neutral body posture (elbows should be at about the same height as the keyboard and hang comfortably to the side of the body; shoulders should be relaxed; wrists should not bend up or down or to either side)
- Should include 2 inches of space to rest the wrists or should be provided with a padded wrist rest

The Chair

- Should support the lower back
- Should be fully adjustable (pneumatic height; seat pan; armrests)
- Should be adjusted so the thighs are parallel to the floor
- Should be supported by a five prong base
- Should have a contoured seat with breathable fabric and rounded edges

Laptop Computers

- Should elevate the laptop off the work surface so the neck is not bent to view the screen
- Should connect a separate keyboard and mouse to the back of the laptop or to a docking station
- Should follow the postural guidelines for working at a personal computer workstation

The Table/Desk

- Should be organized so that frequently used objects are close to avoid unnecessary reaching
- Should provide sufficient leg room
- Should allow for adjustable height. For desks without height adjustment, a keyboard tray and footrest (if necessary) should be provided
- Should have enough surface area (about 8 square feet) to support the computer equipment and space for documents
- Should have rounded corners and edges
- Place the telephone on the side of the non-dominant hand

The Pointing Device (Mouse)

- Should be designed for proper wrist alignment
- Should be placed on the same level and close to the keyboard
- Should fit the hand and provide a comfortable posture (do not bend wrists upward – the hand should rest naturally on the device)
- Alternates to conventional pointing devices should be used when proper wrist alignment and posture cannot be achieved. Examples include trackballs, touch-pads, touch-screens, voice input and pen-like devices. Different pointing devices should be tested or considered to achieve proper postures

The Palm (Wrist) Rest

- Should be used only when there is inactivity, not while typing
- Should be the same height as the keys on the keyboard

The Keyboard Tray

- Should have adjustable height options and be adjusted to the position where the shoulders are relaxed and the forearms are parallel to the floor and form a 90° degree angle with the upper arms
- Should be installed directly in front of the monitor
- Should have a forward and back tilt feature and be adjusted so the wrists are not bent while typing
- Should be large enough to accommodate the keyboard and mouse on the same level

The Footrest

- Should be used when the feet do not touch the floor while seated at the proper height for the workstation
- Should be at least 12 inches deep and 20 inches wide
- Should be movable, but heavy enough to stay in place
- Should have a non-slip surface

The Document Holder

- Should be fully adjustable to permit left or right, up or down, forward or backward and tilted movement and be stable enough to accommodate heavy documents
- Should allow documents to be placed at or about the same height and distance and either beneath or beside the monitor

Helpful Tips

The following tips may also help prevent musculoskeletal problems:

- Alternate work tasks and positions when possible
- Ensure frequently used items (i.e. telephone, etc.) are placed within arm's reach to prevent overreaching
- Take micro-breaks (i.e., one or two minutes) every hour of continuous computer use
- Break up tasks into smaller parts
- Maintain a natural posture
- Keep the pointing device at keyboard level and close to prevent unnecessary reaching
- Get help lifting heavy objects
- Provide supplemental desk/task lighting to maximize illumination for visually demanding tasks while minimizing glare on the computer screen
- Ask vendors for demonstration models to try at the workstation prior to purchasing expensive equipment
- If injuries occur, inform the supervisor, fill out an Employee Accident Report and schedule an appointment with Employee Health Services (614-293-8146)

Summary

The computer workstation is an essential tool in today's workplace. Although musculoskeletal and vision problems can occur, they can be controlled by using the proper equipment, designing workstations properly and following proper techniques and work practices. Take a few minutes to look at your work station and use the information provided in this survival guide. The effort will minimize the risk of musculoskeletal problems, and put you in control of your computer work environment.

For additional information try the following web sites:

- <http://ergo.human.cornell.edu/>
- <http://www.osha.gov/SLTC/ergonomics/index.html>
- <http://www.orosha.org/pdf/pubs/1863.pdf>
- <http://www.ergoweb.com/>