Office Ergonomics and Workstation Analysis

Ergonomics is the study of the relationship between people and their environment. In the workplace, ergonomics is the science of designing or redesigning the workplace to fit the work and improve worker safety, comfort and productivity. Computers have changed our lives tremendously, allowing instant communication and display of data. One issue that is commonly overlooked is how people fit into the office environment. Workers represent a critical part of a work system and continually interact with workstation components to perform a task or accomplish a goal. Each part of the system must be properly designed and adjusted to optimize a worker's comfort, safety and health, while ensuring quality and productivity. With computer use a part of the modern campus and as the workforce ages, the number of musculoskeletal disorders such as carpal tunnel syndrome and tendonitis can be expected to increase unless proactive measures continue to be taken. This section contains information on some basic steps necessary to properly adjust workstations in order to improve working postures and comfort within office settings.

Workstation Adjustment

Chairs
Properly adjusting the chair is a key factor in making workstations more comfortable. If individuals do not know how to adjust their chairs, the supervisor should be asked for help. It is important to adjust the height of the seat and the backrest so that:

- Forearms are parallel to the floor while using the keyboard.
- Upper arms are relaxed and close to the body.
- Thighs are horizontal and feet are flat on the floor (a footrest may be needed).
- Excessive pressure is not on the worker's legs from the edge of the seat.
- The worker can sit with their back against the backrest and it supports the lower back comfortably.

Computer tasks are generally performed best when chairs have adjustable armrests. Armrests that do not adjust often prevent the worker from positioning the chair close to the workstation. This may force some workers to sit on the edge of the chair without the benefit of back support. It may be necessary for an individual to change the seating position frequently throughout the day. For example, the worker may need to sit higher when they are writing on the desktop and lower while typing on the keyboard. If workers use several workstations during the day, consider having them take their chair with them to the different workstations. If chairs are shared with several people, be sure each worker readjusts the chair for use at the beginning of their workday. Non-adjustable armrests can restrict forearm movement, cause arm pressure points and poor shoulder posture. Armrests should have good padding and be height adjustable so forearms are parallel to the floor while using the keyboard.

Contact the supervisor or manager for more information on adjusting chairs.
Keyboards and Mouse
Positioning the worker's keyboard and mouse will help you to work with more comfort and control. Listed below are several key items to remember when positioning the keyboard and mouse:

- Position the keyboard and mouse so that wrists are in a natural relaxed position.
- Place the home row of keys at or slightly above elbow height.
- Maintain a straight wrist to avoid soreness often caused by working long periods with the hands bent upward or downward.
- Raise or lower the chair to the height that allows maintenance of a natural wrist position while using the keyboard and mouse. A footrest may be necessary for individuals who must raise the chair height to a position where their feet do not touch the floor.
- Position the desktop to a height that allows the upper and lower arms to form a 90-degree angle.
- Position the mouse next to the keyboard on the side of the dominant hand.

Be aware that most keyboards have legs along the back that can raise or lower the angle of the keyboard to allow for a neutral wrist posture. Palm rests may also help prevent the worker’s wrist from bending. Keep in mind that the palm rest should only be used while resting, not while typing. Misuse of palm rests can actually cause poor wrist postures and restricted blood flow. Ask the supervisor or manager about palm or mouse supports.

Monitors
Most monitors and monitor stands have adjustments for the tilt, swivel height, contrast and brightness. Surface glare and awkward positioning are common problems for monitor users. The monitor should be positioned and angled so that the worker can maintain a relaxed natural posture without having screen glare. The monitor’s position should not require the worker’s head to be tilted forward to view the text.

Adjust the monitor to make sure that:

- The top line of text is at or slightly below eye level. Individuals who wear bifocals or trifocals can position the monitor lower so they can view the screen through the lower portion of their lenses.
- The distance from the worker’s eyes to the screen is between 18 and 24 inches.
- The monitor is placed at a right angle to windows to reduce glare.
- The contrast and brightness are set at comfortable levels.
- The screen is clean and anti-glare devices or filters are available.
- The screen is located in front of the worker to avoid side head twisting.

Report screen flicker to the supervisor. It may be more comfortable for the worker’s eyes to change the screen background color from dark to light with contrasting text. A supervisor should be able to help do this if necessary.

Lighting
Proper lighting levels are important in the office environment. Windows, overhead lighting and reflections from shiny surfaces can create glare and reflections on the monitor’s screen. To reduce eye fatigue and distractin reflections, make sure that:

- The drapes are drawn or adjust the blinds.
- Use adjustable task lighting or desk lamps for documents.
- Reduce overhead lighting where possible by turning off lights, switching to lower wattage bulbs or dimmer switches.
☐ Have non-reflective surfaces to reduce glare.

Avoid bright or strong contrasting colors in the field of vision. A bright wall behind a dark monitor screen can cause eyestrain from eyes repeatedly adjusting from the bright surroundings to the darker near field of view. Also, place task lighting or a desk lamp so that it does not create a glare on the monitor screen.

The American National Standards Institute, Human Factors and Ergonomics Society recommends light levels at the work surface between 30- to 50-foot candles (ANSI/HFES 100-1988). A standard photography light meter can be used to measure illumination.

**The Document Holder**

If the worker transfers information from a paper document to the computer, a document holder may be helpful. A document holder or copy stand that is properly positioned can make data entry less stressful, increase efficiency, improve posture and allow the worker to work more comfortably. A document holder that is placed close to the monitor changes the head twisting to less stressful eye movements. Maximum comfort and benefit is gained when the document holder is placed:

☐ Close to the monitor.
☐ The same distance from the eye as the monitor.
☐ The same height and angle as the monitor.

There are a variety of document holders and stands available to accommodate different sizes of paper. Ask the supervisor for assistance in obtaining one that meets the worker’s needs.

**Arranging the Work Area**

Properly arranging the work area and keeping the work surface orderly improves worker effectiveness and comfort. Think about how workers use things in their workstation and which items are used most often. For example, if the worker is right-handed, place the phone to their left so that they can write or use the calculator while holding the phone. Desks should be clear of unnecessary items and often used documents placed within easy reach. The best layout depends on the worker’s computer activities. If the worker performs repetitive tasks, arrange their furniture and equipment to allow an uninterrupted flow of materials. Equipment and frequently used files should be located next to the worker. In all cases, wires and cabling associated with the workstation should be arranged and secured to prevent a tripping or fall hazard when the worker enters or leaves the workstation.

Some examples of computer workstations include:

☐ **Data Entry Workstation**

Data entry requires the worker to constantly enter data into the computer using the keyboard and source document. For this arrangement, the keyboard and source document should be placed directly in front of the worker with the display off to the side. Documents should be the same height as the display.

☐ **Dialogue Workstation**

High-frequency dialogue requires the worker to continually retrieve and enter information in the computer. The screen and keyboard are the most important items and should be placed directly in front of the worker. Source documents are not as important as the screen and keyboard and should be off to the side.
Data Inquiry Workstation
Data inquiry requires the worker to retrieve from the computer screen and verify or write down information on a document. The screen and document are the most important elements. The screen and writing areas should be the closest to the worker.

Screen Pointing Device
The computer mouse (or screen-pointing device) is an important part of the computer workstation. If the worker is right-handed, clear the right side of the computer work surface to move the screen-pointing device. Similarly, if the worker is left-handed, clear the left side of the computer work surface to move the screen-pointing device. It is important to support the worker's forearm and elbow while using the device. The vertical height of the pointing device should be at the same level as the keyboard.

Take Care of Yourself
Even with a properly adjusted workstation, sitting still for long periods of time can be tiring and stressful. Have the individual alternate sitting with standing while working, if the task and workstation allows. Also, have the individual try to alternate different tasks throughout the day and vary work activities; for example, getting up from the computer to photocopy or deliver completed work.

Stretch occasionally and look away from the monitor. Sit back in the chair and use the backrest, rather than leaning forward or setting in the middle of the seat. Stretching and relaxation exercises can help to reduce stiffness and discomfort.

The following exercises can help:

- Periodically stretch arms and legs while either setting or standing.
- Rotate head slowly from one side to the other, relaxing the neck muscles.
- Roll shoulders forward and backward several times.
- Stand up with arms down at your sides and breathe in slowly through the nose, exhaling slowly through the mouth.
- Make a tight fist and hold for a second, then spread fingers apart as far as possible. To reduce eye fatigue and irritation, several eye exercises listed below can be used to relax eye muscles:
- Close eyes, cup hands and place them over eyes for one minute. Open eyes with hands still covering eyes. Slowly spread the fingers to allow the eyes to adjust gradually to the light and then take hands away.
- Look at an object 20 feet away and focus on it for five to 10 seconds (do not choose a bright object). Blink eyes slowly several times while taking deep breaths.

Vision care is extremely important when working with a computer. Make sure you have regular eye examinations and proper corrective lenses if needed. Describe your job duties to your vision care provider during your eye examinations.

Should you need further assistance with workstation adjustments or ergonomic equipment, please contact your supervisor or the Human Resource Office.
Office Ergonomic Workstation Checklist

Yes or No: If no, what assistance is needed?

- Is your chair adjusted with your feet resting firmly on the floor or on a footrest? _____
- Do you have ample legroom? ______
- Are your arms comfortable while working at the keyboard? ______
- Is your wrist straight when using the keyboard? ______
- Do you have a wrist or palm rest device for the keyboard? ____
- Is your mouse the same height as the keyboard?____
- Do you have a wrist or palm rest device for the mouse? ______
- Is the top of your monitor screen at a comfortable height (approximately eye level)? ______
  Note: Individuals who wear bifocals or trifocals may need to position the screen slightly lower than eye level.
- Is your screen positioned to avoid reflections and glare? ______
- Can you reposition your monitor? ____
- If needed, do you have an anti-glare filter? ______
- Have you adjusted the screen contrast and brightness to a comfortable level? ______
- Do you have ample back support? ______
- Are all task items within easy reach? ______
- Are you changing postures and positions throughout the day or doing other non-data entry tasks (e.g., filing, copying, etc.) with your computer tasks? ______
- Do you take your authorized breaks? _____
- Can you do stretching exercises at your workstation? _____
- Is your screen and glare filter clean? ______
- Are there wires or cabling located below the workstation that may cause a tripping hazard? ______

Answering “No” to any of the questions is an indication that a workstation adjustment or modification may be necessary. Contact your supervisor or the Human Resource Office to discuss your needs.