

## **COMPUTER ERGONOMICS SELF-HELP GUIDE**

The following guide is provided to assist you in making your workplace a safer and more comfortable place to work. With this information, you should be able to examine your workplace and make adjustments that will improve the ergonomics of your workstations.

### ***LIGHTING***

1. To reduce glare and eye strain, the monitor should be positioned at a right angle to windows in the office. Shield or move the light source to eliminate direct glare. Indirect glare can be reduced by: moving the light source, moving the monitor, changing the monitor angle, or using a glare filter.
2. Windows should have blinds or other means to control incoming light. (Use them!)
3. Keep the monitor screen clean!
4. Glare screens can be used as a last resort. Glass or plastic glare filters generally perform better than mesh filters. Lighting levels should be 20-50 foot candles and task lighting used if more light is needed at other work areas. Indirect lighting is best; parabolic lenses with fluorescent fixtures are also good.

### ***KEYBOARD and POSTURE***

1. Elbows should be at sides with shoulders relaxed. Keyboard should be pulled close to the body.
2. Keyboard support surfaces should be wide enough (minimum ~30 inches) to accommodate the keyboard and the mouse. An alternative is to utilize two separate surfaces, e.g., a keyboard and a mouse tray which are the same height.
3. Keyboard height should be approximately equal to seated elbow height and forearms are roughly parallel to the floor with elbows bent 90 degrees. Adjust chair height to accommodate this elbow/forearm position and utilize a footrest if necessary.
4. Computer table should be as thin as possible to allow plenty of thigh clearance. (Standard desks do not make good computer tables because the height is too tall and the desk because of the pencil drawer is too thick.)
5. Wrists should be flat over the keyboard. Soft wrist rests, which are approximately the same height as the keyboard space bar, may assist in keeping wrists in this neutral and flat position. Lowering the back legs on the underside of the keyboard may also help keep wrists neutral while typing.
6. Arms and wrists should not be rested against a hard and/or sharp surface. Wrist rests can be used to provide a padded, soft surface to rest the wrists.
7. Move whole hand to reach distant keys; don't stretch hand. Utilize the wrist rest only when not typing so that you move your hands when reaching for keys.

### ***MONITOR***

1. The top of the screen should be at eye level or below so operator looks slightly down at screen.
2. The operator should not have to tilt back to look at any parts of the screen. People with bifocals have particular trouble with this. It is best for bifocal wearers to position their monitor screens very low, or get computer glasses.
3. Position monitor directly in front of the user, not to the side. The depth of the computer work surface must be deep enough (minimum 30 inches depending on size of monitor) to allow this set up. Positioning monitors to the side may cause neck strain.
4. Keep an arm's length away from the front of the monitor. Also keep an arm's length away from the backs and sides of other monitors.
5. Document holders should be about the same height and distance away as the computer monitor.

### ***SEATING***

1. Chairs should provide good lumbar (lower back) support. If they do not, lumbar cushions may help. Sit back in chair and use the backrest. Don't perch.
2. Chair height should be adjusted such that the feet rest flat on the floor with the thighs parallel to the floor. If work surfaces are too high, the chair should be raised up to an appropriate height and footrests used under each workstation. Pneumatic height adjustable chairs are desirable.
3. In most cases, chair armrests are beneficial to address upper back, shoulder and neck issues. If provided, armrests should be padded and at a height that allows elbows to be at one's side. Many chairs are available with adjustable (height and/or width) armrests. In addition, armrests must be recessed such that the user can easily pull up to the work surface and work with elbows at approximately 90 degree angles.
4. Five-legged chairs are recommended over four-legged chairs for stability reasons.
5. Clearance for the legs should be provided at all seated computer workstations. Suggested minimum clearances are 15" at the knees and 24" at the feet.

### ***WORK PRACTICE***

1. Stretch several times a day (once per hour) and take frequent mini-breaks from keying.
2. Change posture frequently.
3. Don't bang keys. Keep hands and fingers as relaxed as possible over the keys.

For additional information about ergonomics and assistance or training in ergonomics call EHS at 882-7018 or e-mail to [riddlemoserr@missouri.edu](mailto:riddlemoserr@missouri.edu)

## **Appendix: Workstation Adjustment**

If a VDT workstation has many adjustments, the minimum steps of adjustment to be taught to users include the following. These instructions assume independently adjustable work surface and keyboard height, and an adjustable chair. These instructions are simplified for a typical case and should always be modified based on job and personal factors.

1. Start with the feet flat on the floor.
2. Adjust chair height to a comfortable position that keeps the feet on the floor and thighs approximately parallel to floor. Forward sitters may prefer to sit higher than this; recliners may prefer to sit lower. People in knee-tilt chairs tend to prefer higher positions than people with column-tilt chairs who lift their feet when reclining.
3. Adjust chair tilt tension so the user can recline mostly by a weight shift rather than pushing off with the feet. If the heels rise significantly off the floor when reclining, the user is pushing with the feet too much and the tension should be lightened. If the user prefers not to recline, the tension can be kept tight.
4. Adjust the keyboard height and angle so the user is comfortable and the wrists are in a neutral (straight) position.
5. Place the mouse where it can be used without reaching.
6. Adjust the monitor height so the entire viewing area is somewhere below eye level.
7. Adjust the monitor angle to face the user's eyes. This can be checked with a small mirror on the center of the screen; the user should be able to see his or her eyes.
8. Check for monitor glare and correct it by changing or shielding the light source, or by rearranging the workstation. Do not reduce glare by compromising the monitor height, angle, or location.
9. Adjust the work surface height so the shoulders are not abducted significantly when writing or reading. Work surface height is less important than keyboard height for people who spend most of their time keying.
10. Place the documents (if used during VDT work) at about the same distance from the eyes as the monitor, and perpendicular to the line of sight.
11. Adjust the document and monitor position to minimize eye and head movement between them. People who look equally at the monitor and document may prefer to place them at either side of a centerline rather than have one or the other in the center.

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