

Workstation Adjustment Procedures

For well-designed equipment, the following adjustment procedure is recommended for maximum comfort, recovery and protection against development of musculoskeletal disorders (MSDs).

1. Position the workstation to avoid glare. Windows should be to the side of the workstation, neither behind nor in front of the operator. Ceiling lights should be to either side of the operator, not directly behind.
2. Align chair, keyboard, and monitor, with monitor directly in front of you.
3. Adjust the height of the chair before anything else; this is the height to which all other adjustments relate. Feet should be comfortably flat on the floor, the seat pan low enough so that its front does not cut into the back of the knees. (The usual recommendation is that the back of the knee, while standing, should be 2" above the top of the seat pan; this can vary somewhat according to comfort.)
4. Adjust the height of the arm rests to support the shoulders in a neutral posture (see Appendix I for definition of "neutral posture" for various joints), neither forcing them into a hunched position nor requiring them to droop to reach the rests.
5. Pull the armrests comfortably close to the body. Ideally, the armrests can easily swing out of the way when leaving or entering the chair. Once seated, always pull them close.
6. Adjust the height of the lumbar support to place the bulge exactly in the small of the back.
7. Adjust the tilt of the lumbar support 10-15° behind vertical. This takes some of the trunk weight off the vertebral discs. The best angle varies with the operator, the task, and the time of day. Individuals should experiment to find the best angle, and, once this is determined, it is recommended that it be changed slightly several times in a workday, to distribute stresses.
8. Adjust the height of the keyboard tray so that it is almost in the lap (unless you need to look at the keyboard). Elbow angle should be 90° or more, depending on comfort. Some evidence suggests that an elbow angle of 110°-120° can reduce stress on the ulnar nerve.
9. Adjust the tilt of the tray so that the wrists adopt a neutral posture (see Appendix I). Usually, a negative tilt (away from the operator) is needed to achieve this posture. This adjustment may require a slight re-adjustment (usually down) of the keyboard height
10. Adjust the height of the monitor so that the top of the screen is roughly even with the operators eye level. **Exception:** If wearing bifocals, monitor must be lower; adjust so head is upright while viewing through lower lenses. The goal is to balance the weight of the head on the spinal column, thus reducing muscle force needed to keep the head upright.
11. Ideally, the monitor screen should be perpendicular to a line from the operator's eyes to the screen. Slight adjustments to this angle are acceptable, in the interests of reducing glare.
12. Whenever possible, increase the size of the type (for word processing) or the objects (for programming, graphics work, etc.) on the screen. This accomplishes a dual function:
 - a. The tendency to lean forward is reduced
 - b. Mouse movements can be larger; the need for fine control (which often results in tensed forearm muscles) is reduced.
13. Use the copyholder to hold copy even with the screen--at the same height and same distance from the eyes. The task light should then be used to illuminate the copy to approximately the same brightness as the screen. Copy tilted just below the screen is acceptable, also.
14. Real activity breaks (i.e., work that involves different muscle groups and removes the eyes from a monitor screen) should be taken every hour, for at least 5 minutes. Do not work through coffee breaks and lunch. Short (1 minute) relaxation breaks every 15-20 minutes (breath deeply, pay attention to body position, stretch as necessary) are important.

Appendix I: Definition of Neutral Posture

"Neutral Posture" simply refers to the resting position of each joint--the position in which there is the least tension or pressure on nerves, tendons, muscles and bones. Muscles at this length can develop maximum force most efficiently. One aspect of ergonomic redesign is the reworking of tools, workstations and processes to allow the worker's joints to remain in neutral position as much as possible.

- Fingers should be gently curved, in their natural resting position.
- Wrists should be in line with the forearm, not bent up, down, or to the side
- Forearms should rest with the thumb up, as if you were shaking hands.
- Elbows should be bent between 90° and 110°
- Upper arms should hang straight down from the shoulder and be close to the body.
- Shoulders should be in a relaxed, resting position, neither hunched up nor pulled down, and not pulled forward or back.
- Head should be balanced on the spinal column, facing straight ahead, not tilted forward, back, to either side, nor rotated to the left or right.
- Back should be in its natural S-shaped curve, with a gentle curve in the lumbar region. The spine should not twist or bend to the left or right. Whether standing or sitting, the trunk should not bend excessively forward or backward (although a good backrest on a seat does allow a supported lean backwards).
- Lower Body. Under conditions of weightlessness (e.g., in space travel), the lower body naturally assumes a fetal position--hip and knee joints somewhat bent. Thus, both seated and standing postures involve deviations from neutral posture. Well-designed work should allow employees to alternate between sitting and standing positions, if possible.