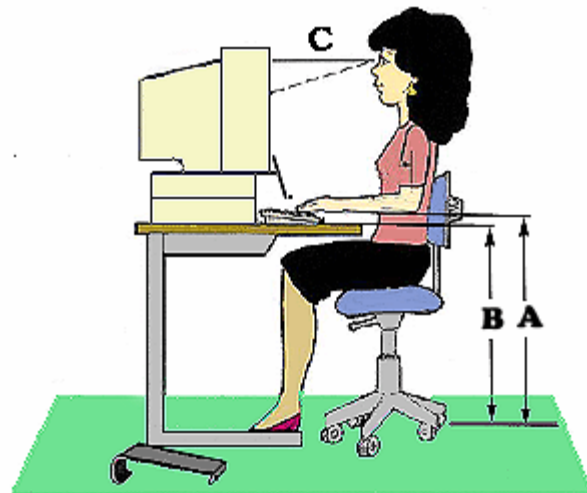


# Computer Workstation Design

## What is the Optimal Keyboard, Mouse, and Monitor Height?



### Measurement A: Sitting Elbow

Adjust the chair so your feet are firmly on the floor and your knees are even to or slightly lower than your hips. Relax your shoulders, place your hands in your lap, then raise your hand even with your elbow. Ask your ergo buddy to measure the distance from the floor to your elbow.

### Measurement B: Keyboard/Mouse Surface

There are three options for the height of the surface that supports the keyboard and mouse, depending on what type of keyboard you use and on your typing style. In any case, the keyboard and mouse should never be higher than your elbows. Using the Sitting Elbow height you measured above (Measurement A), determine the correct keyboard/mouse surface height for yourself as follows:

1" lower than Measurement A for an ordinary keyboard.

2" lower than Measurement A if the MS Natural keyboard is used.

Equal to Measurement A if you look at your hands to type.

## Measurement C: Monitor Height

The monitor should never be so high that you have to lift your chin to see any part of the screen. Therefore, the top ¼ of the screen should be equal with your straight-ahead vision, unless most of your work is done in the lower ¼ of the screen (then the monitor can be higher) OR if you wear bifocals (then the monitor needs to be lower). Do not place the monitor on the hard drive/docking station if doing so makes it too high.

## Reading/Writing Surface

Your work surface should be 2" above your sitting elbow. You should be able to sit comfortably under the surface and work at it without elevating your shoulders.

## Ergonomic Equipment, Tools, Office Supplies

An "ergonomic" product is one that fits the user and is appropriate for the task (i.e., it does not cause discomfort or injury and improves productivity). There are a large variety of quality and cost-effective products available. Please refer to the Products portion of this website for our recommendations.

- *Wrist rests and arm supports.* Wrist rests should be used to keep the wrists flat and off of a cold, hard surface when you are not typing or using the mouse. It is important to move your hands across the keyboard, to use your full arm while mousing, and to not plant your wrists on the rest to avoid hand strain.
- *Footrests.* A footrest should be used if the work surface cannot be lowered to the appropriate height (i.e., keyboard surface @ 1 - 2" below the user's sitting elbow height, writing surface @ 2" above sitting elbow height). The chair must be raised to accommodate the work surface height, causing the knees to be lower than the hips. A footrest will improve this angle and, more importantly, will create adequate back support by allowing the back to rest against the back of the chair.
- *Keyboards and trays.* If your forearm is not parallel to the floor, the keyboard is too high. If your elbows are away from your body while typing/mousing, the keyboard/mouse is too far away. Finally, if your upper body feels tense while typing with your wrists off the rest/desk, the keyboard is too high. A keyboard tray is one option of improving your computer set-up. Warning: a keyboard tray should always be long enough to accommodate the mouse.
- *Input devices (i.e. mice).* Many standard-issue input devices are not designed correctly for the user's hand. Alternative devices with a click-lock feature and programmable software are superior. (Note: The software can always be updated by downloading the latest version from the Internet.) The device must not increase stress in the hand, promote wrist extension, or overuse the thumb. The Logitech, Kensington products and Contour products are good options.

The mouse or trackball should be placed adjacent to the keyboard. The user should be able to keep the elbow close to the body. Users tend to chase the mouse to the opposite side of the work surface and wind up using the mouse at full arm reach resulting in very awkward postures for the neck, upper back, and shoulders. Movement of the mouse should come from the shoulder and arm, not isolated to the wrist and hand. Trackballs should be moved with the entire palm, fingers, and forearm. Curling and extension of the fingers is not desirable.

- *Office supplies.* Writing tools, scissors and staplers can all cause undue stress in the user's hands. Individuals should use the tools that fit their hands and task. For example, a pen that is too slim requires much more forearm force to grip than does a wider pen or a pen with a foam grip on it.
- *Slant boards and document holders.* To avoid serious neck and back pain, it is critical that all documents referred to during keyboarding are supported by a holder. Individuals who read or edit should always use a slant board to prevent neck flexion.
- *Monitor stands.* Typically, the computer CPU case is not an appropriate monitor stand because it raises the monitor much higher than the user's straight-ahead vision. The top of the screen should be at eye level unless you are wearing bifocals, not the middle of the screen. Stackable risers or a height-adjustable stand is most effective for supporting the monitor.
- *Computer accessories.* Alternative keyboards and other computer accessories are not designed for all users. ("Ergonomic" keyboards sometimes cause more problems than they alleviate.)
- *Headsets.* If your job requires prolonged phone conversations or simultaneous phone and computer/desk work, a headset is a necessity. Cradling the phone causes tremendous neck strain.