

Guide to Office Ergonomics



Chairs

The chair is the main body support for people sitting most of the day. A well-adjusted chair improves circulation and reduces fatigue. Chairs also help prevent stress and tension in the neck and shoulders.

Adjust the seat height first. Optimal seat height has 90-degree angles at the hip and knees. Angles less than 90 degrees increase pressure in the abdominal area, spine, and upper legs. Angles slightly more than 90 degrees are all right if the backrest is used.

Changes may be needed if the chair height cannot be adjusted.

Use a footrest if a chair is too high. A seat cushion can adjust a chair of insufficient height. The chair height is correct when the feet rest on the floor or footrest and the back of the knee is slightly higher than the seat of the chair. This allows blood to circulate freely in the legs and feet.

A proper backrest reduces pressure on the spine and supports the lower back.

The backrest should fit snugly against the lower back, with the lumbar support at about belt level. If it cannot be adjusted, use a small firm pillow or rolled up towel as a lumbar support.

Displays

Poor monitor placement can cause muscle tension in the neck, shoulders, and upper back.

- Changes to the display can also reduce eyestrain.
- The task and the operator's height determine the height of the display screen.
- Screens that swivel horizontally or elevate enable the operator to select the optimum-viewing angle.

The display should be set up as follows:

- The top line of the display should not be higher than the user's eyes.
- A height adjustable monitor holder is ideal but not required.
- A ream of paper or a phone directory can raise a low monitor.
- Moving the CPU from under the monitor will lower a monitor that is too high. Confirm that the display sits on a stable, sturdy surface.
- Air vents on the monitor should be unrestricted.

The layout of work area depends on the nature of the work.

- Place the monitor directly in front.
- A document holder reduces constant changes in focus and movement of the neck or back.
- For jobs that require looking back and forth between documents and the monitor, place the document holder next to the monitor.
- The document holder should be at the same level and distance from the eye. Placing the document holder in front of the employee is preferred for jobs with constant looking at the document.
- The preferred viewing distance for VDTs ranges between 16 and 30 inches.

Keyboards

Proper keyboard height helps keep the wrists from bending while typing. This improves the comfort of the hands, wrists, and forearms.

The preferred working position is as follows:

- Set hands with the fingers on the middle row of the keyboard.
- Arms should be parallel to the floor and the elbows at the sides.
- Wrist should be in line with the forearm.
- The neutral posture for wrists is a straight (handshake) position.
- If the wrists are not straight, adjust the keyboard.

Look for forearms to be parallel to the floor and wrists straight while keying.

- If the keyboard height is not adjustable, adjust your chair height.
- Make sure your feet remain flat on the floor or you will need a footrest.

If your wrists are still at an awkward angle, look at your keyboard angle.

- Keyboards typically come with two small tabs underneath that increase the keyboard angle.
- This increased angle is not always needed.
- Lowering the keyboard angle can reduce wrist hyperextension (palm up).
- Increasing the angle can reduce Hyper-flexion (palm down). Avoid any of the two extremes.

To keep the wrists relaxed, try a wrist rest or padded support.

- One might be cautioned however, that wrist rests could put additional pressures on the nerves, especially if a person has symptoms of Cumulative Trauma Disorders.

Lighting

Light should not shine into your eyes when looking at the screen.

- Bright light can cause discomfort and fatigue.
- Factors that affect comfort include quantity, contrast, and glare.
- Fixtures and daylight provide lighting for work areas.
- Too much light "washes out" images on the display screen.

- Lower the lighting levels when using VDTs if possible.

Contrast is the difference in brightness between two areas.

- Try to prevent the visual load caused by nearby light and dark areas.
- Minimize the brightness difference between the VDT screen, work surface, and surrounding areas. Choose a background color on your monitor that is similar to the background of the work area.

Many things contribute to glare.

- Direct sunlight from a window is a frequent cause of glare.
- Other sources include reflected light from surfaces and improperly directed task lighting.

Glare can be annoying, uncomfortable, and decrease visibility.

- Check your computer monitor for glare by turning off the monitor while positioned.
- Note the amount of reflection from the screen. You should not see a clear reflection of yourself.

Simple changes help minimize glare and reduce strain on the eyes.

- Some changes that can be made include:
 - Control light from windows with window blinds or shades.
 - Locate the display monitor at right angles to windows or other light sources.
 - Adjust the angle of the display monitor to remove glare.
 - Direct task lights and lamps away from the display screen.
 - Install antiglare filters over the screen.

Need an ergonomic evaluation? Please call the Environment, Health, and Safety Office at x6727 or send an email to safety@caltech.edu.