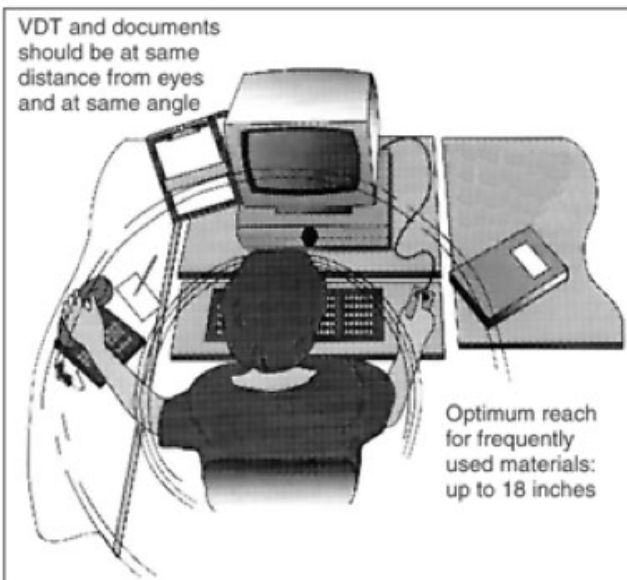


It is important to maintain a neutral wrist to minimize the potential for developing a REPETITIVE MOTION INJURY, whether the operator is sitting while conducting a task (such as working at a computer workstation) or standing (for example, using a hand tool in a shop). The workstation should be designed so that a neutral wrist position can be maintained as much as possible.



Two views of natural (preferred) wrist position

The work envelope is the zone in which an employee performs most routine tasks, whether repetitive movements (e.g., typing at a keyboard) or less frequent movements (e.g., lifting). Work should be arranged to be within easy reach and usually performed work located within 12 inches of the operator. Frequently used materials should be located within 18 inches of the operator. Such an arrangement reduces potential discomfort to the back, shoulders, and arms by avoiding awkward postures and positions. Employees should never reach behind their shoulders.



Office Work Envelope

Good Work Practices

- Avoid mechanical stresses to the arms. (For example, avoid resting hands or forearms on the sharp table edge).
- Rest between tasks that require hand grasping or pinch gripping. (Such as grasping large files, or stapling).
- Rest and stretch after repetitively performing the same motion or motion pattern (every few seconds for more than 2 hours continuously or four hours daily).
- Avoid working in a position that requires maintaining an unsupported fixed or awkward posture (for more than 1 hour continuously, or four hours daily). These postures include raised elbows and arms, bent wrists or hands.
- Avoid using vibrating or impact tools or equipment for more than 1 hour continuously or 2 hours daily.
- Avoid using forceful hand exertions for more than two hours daily (greater than 7 lb. of hand force).
- Unassisted frequent or heavy lifting should be avoided also. A person may be able to lift heavy loads, but the potential for back injury increases with each lift.

Preventive Measures

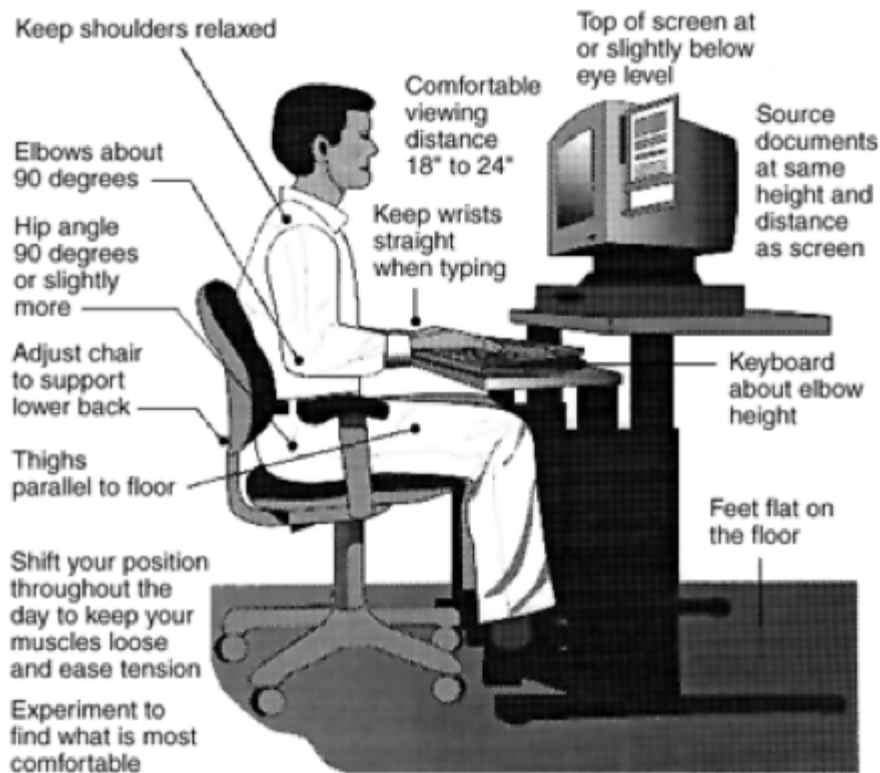
- Evaluate the workplace to identify ergonomic risk factors and potential sources of accidents. Avoid awkward motions and postures.
- Encourage employee awareness and provide education.
- Use ergonomically appropriate work habits and require the same of employees.
- Take frequent breaks, stretch, and move around to keep muscles flexible. Workplace exercises relieve physical discomfort.
- Use ergonomically designed hand tools and furniture. The preferred furniture provides flexibility for adjustments and allows for preferred individual posture. Furniture and the workplace should be adjusted to the user.
- Perform five minutes of alternative work activity, or resting for every 30 minutes of continuous, high intensity, repetitive work. For example, after two hours of continuous keyboarding, devote 15 minutes to non-repetitive motion activities like returning phone calls or filing.
- Expand the tasks a person performs to minimize the constant repetition of any one particular task.
- Evaluate and intervene when the employee complains of repetitive motion injury symptoms or when the employee complains of back pain. Prompt corrective action is required to allow for the body to recover from overexertion.

Prevention is the key to reducing and eliminating the risk of a person developing a repetitive injury. Prevention includes the use of good body mechanics, good ergonomic design (engineering controls), and the use of administrative controls. Early intervention makes a

difference for employees who complain of pain, numbness, tingling, or tenderness in the fingers, hands, or arms or pain in the back, shoulders, or legs from lifting or other body motions.

Computer Workstations

A computer workstation or video display terminal (VDT) should be designed to accommodate each user by being adjustable. The workstation should allow each employee to adjust the VDT furniture (chair, work surfaces, table, document holder) and reorganize the work area to fit individual needs. Good body posture permits an employee to relax while maintaining a neutral body position. The posture employed should minimize muscle tension and body strain.



Preferred posture at a computer workstation

Person's Height	Standing Surface	Seated
5'2"	37.1 inches	22.3 inches
5'3"	38.2 inches	22.4 inches
5'4"	38.8 inches	23.0 inches
5'5"	39.6 inches	23.8 inches

5'6"	40.1 inches	24.4 inches
5'7"	40.7 inches	25.3 inches
5'8"	41.9 inches	26.4 inches
5'9"	42.5 inches	27.0 inches
5'10"	43.3 inches	27.6 inches
5'11"	43.5 inches	27.8 inches
6'0"	44.2 inches	28.3 inches
6'1"	45.4 inches	29.5 inches

Guidelines for work surfaces and chair heights (data collected by the U.S. Army Department of Personnel)

Chairs

- Use a chair that is stable, mobile, swivels, and allows for operator movement.
- Use a chair that provides substantial lower back support. The back support should be easy to adjust backward, forward, up, and down. A properly adjusted chair is important to help reduce or prevent discomfort on the back and should support the inward curve of the back.
- Use a chair that has an adjustable seat height. Raise or lower the chair to a comfortable height such that the thighs are parallel to the floor and the knees are at a 90-degree angle. Rest the feet flat on the floor or use a footrest.
- Use the armrests if they allow maintaining elbows at a 90-degree angle. If the armrests obstruct sitting posture, then adjust the armrests, use a chair that allows an erect posture, or use a chair without armrests.

Work Surfaces

- Adjust the work surface (table) so that the keyboard is at the correct height to maintain the best posture (elbows at keyboard height with the forearms parallel to the floor). If possible, use a split-level design table that has an adjustable top height: the lower level for the keyboard and mouse or trackball, and the upper level for the VDT monitor. The height of each level should adjust separately.
- Use a table large enough to hold the keyboard, monitor, wrist rest, mouse or trackball, and a document holder or all necessary documents.
- Keep adequate clearance under the table for leg length, knee height, and thighs.

Monitors

- Position the VDT monitor directly in front of and in line with the keyboard.

- Position the VDT at a comfortable viewing distance (18-24 inches from the eyes), viewing height (top of the display screen at or slightly below eye level), and viewing angle (10-15 degrees below the horizontal line of sight).
- Use a VDT monitor that tilts and rotates.
- Use a VDT monitor that has adjustable contrast and brightness. Adjust the contrast to a high level and the brightness to a low level to minimize or prevent eyestrain.
- Keep the display screen or glare shield clean because dust reduces character clarity and reflects light.

Keyboards

- Use a keyboard that is detached from the VDT monitor.
- Position the keyboard directly in front of your torso.
- Position the keyboard approximately at elbow height.
- Adjust the keyboard angle to a comfortable position; keep the wrists straight and in line with the forearm. The control to adjust the angle is located at the rear of the keyboard.

Other Input Devices

- When using a mouse, trackball, or special keypads, place the wrist in a neutral position. Rest the arm and hand close to the body and at the natural elevation. Do not reach forward, outward or raise the shoulders.
- Use the whole arm to move the input device instead of just the wrist.
- If the arm is resting on the table edge (hard work surface) when using the mouse or trackball, then use a mousepad rest to provide a cushion.

Wrist Rests/Pads

- Use a wrist rest for support to help maintain a neutral wrist position.
- Use a wrist rest for cushioning to protect the wrist from resting on a hard or sharp work surface. Note that wrist rests are designed to be used during pauses in typing.

Document Holders

- Use a document holder that has an adjustable height.
- Use a document holder that is large enough to support the documents.
- Position the document holder beside and parallel to the display screen.
- Position the document holder at the same height and distance as the display screen. This positioning minimizes the amount the operator has to turn his or her head to look from the document to the display screen and reduces eye muscle fatigue by maintaining the same focal distance.

Footrests

- A footrest may be necessary if the operator cannot place his or her feet comfortably on the floor.
- Use a footrest that has an adjustable height and heel stop.
- Use a footrest that is large enough to allow for operator movement.

Eyewear

- The VDT operator should have eye checkups on a regular basis. Some VDT operators who wear corrective lenses or contacts should wear lenses designed specifically for VDT use.

Printers

- Use a printer with a low noise level. Otherwise, enclosing the printer in a noise-absorbing box can reduce discomfort from high noise exposure.
- Locate the paper supply where the operator can easily reach it.

Exercises

- For the eyes, look away from the work to a distant point at least every hour.
- For the body, stretch the neck, shoulders, back, legs, arms, and fingers at least twice a day. Stand up and walk around often to increase blood flow circulation. Warm-up exercises are recommended in the morning, prior to commencing work, and after lunch, to recondition for data entry work.