

# SAFE WORK



July, 2004  
Bulletin No. 232

## Making Your Computer Workstation Fit You

*Office injuries usually occur gradually and often go unnoticed until there is significant discomfort. The single largest factor in office injuries is poor posture. While improper posture may not result in an injury after a week, a month or even a year, prolonged exposure to improper posture will greatly increase the risk of developing an injury. Although it is possible for these injuries to heal themselves when the ergonomic hazard is removed, cases do exist where individuals have done enough damage to require corrective therapy, in addition to removing the hazard.*

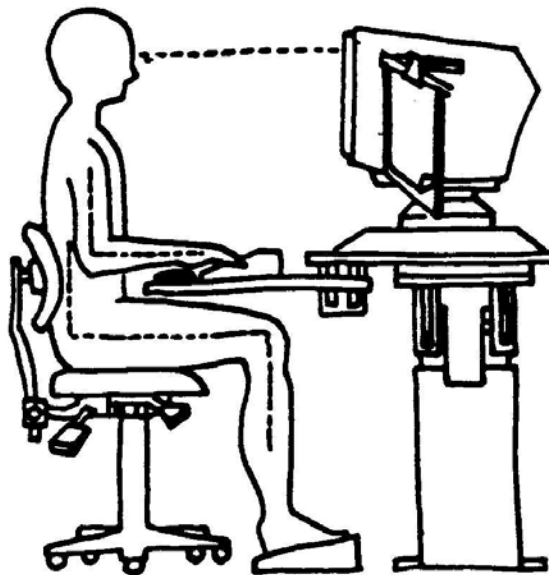
The picture below shows an ideal workstation set-up, with general recommendations for equipment positioning. The posture that results from your equipment set-up is important to maintain overall health. For information on a specific topic in office ergonomics please refer to the bulletins listed at the bottom of the page.

**Chair:**  
Height – should allow adequate thigh clearance below desk and promote elbow angle of no less than 90°. Some people are more comfortable with an elbow angle greater than 90° (hands lower than elbows) provided flat wrists are maintained. See Bulletin # 233 for chair features – lumbar support, armrests, tilt, depth, casters.

**Keyboard:** Position at a height that allows elbows to remain at a 90° angle or greater, and neutral wrist posture.

**Mouse:** Position at same height as keyboard to maintain a neutral wrist position. Position close to keyboard to reduce reach and deviation from proper seated posture.

**Document Holder:** Use to maintain a neutral head position when transferring information from documents into computer. Position as close to the monitor as possible to reduce neck flexion and rotation.



**Footrest:** Use when chair height does not allow feet to be supported comfortably on the floor. Footrest should be set to keep the knee and ankle joints at an angle of approximately 90°.

**Monitor:**  
Height – adjust to promote neutral neck posture, with the top of the screen at eye level or slightly lower.  
Viewing distance – dependant on task and monitor size, but normally an arm's length when seated in front of the keyboard maintaining proper posture.  
Backrest Tilt – slightly tilted to prevent forward slouch.  
Position - centered in front of user to minimize neck rotation. Located and positioned to reduce glare from indoor or natural light.  
Bifocals - not designed for computer use. Corrective lenses are available for computer specific applications.

For more specific information refer to the following Bulletins:  
# 233 *Ergonomic Hazards of the Seated Position*  
# 234 *Office Ergonomics: Neck / Shoulder Hazards*  
# 235 *Office Ergonomics: Arm /Hand / Wrist Hazards*

### **What to do when you encounter an ergonomic hazard**

1. Refer to the appropriate Safe Work Bulletin (#233, #234, #235 – bulletin titles on front page).
2. Based on the bulletin information, attempt to correct the ergonomic hazard, i.e. reposition monitor, raise/lower your chair, etc.
3. If you are unable to determine or achieve an appropriate correction:
  - Refer to the Workplace Safety and Health Division's website – <http://www.gov.mb.ca/labour/safety> for additional resources

or:

  - Inform a member of the workplace safety and health committee, or safety and health representative and have the ergonomic hazard noted and addressed. (every workplace with 20 or more workers is required to have a workplace safety and health committee under the Workplace Safety and Health Act, **W210: 40**)

*Note: Arranging the workstation appropriately can solve some ergonomic hazards quickly and simply. Other ergonomic hazards may require changes in the equipment that is required to perform the job.*

### **Non-neutral posture**

- When standing with good posture - facing forward with arms at your side and feet pointed forward - you are in neutral posture.
- Deviations from this posture change muscle length, and change the blood flowing to the muscles.
- The greater the amount of deviation, the more stress is placed on the joints, muscles, nerves and blood vessels.
- Non-neutral postures are problematic when held for prolonged periods (**static loading**), or done repetitively without adequate time for tissues to recover.
- The office environment has numerous non-neutral postures that are unavoidable (i.e. sitting down), and some that can be avoided with proper set-up (i.e. raised shoulders).

### **Static Loading**

- Blood vessels are flexible tubes that pass through the muscles.
- When a muscle is working, it requires blood flow to receive nutrients and to remove waste.
- When a muscle is held in one position without relaxing, it squeezes on the blood vessels, decreasing blood flow to the working muscle.
- Decreased blood flow can result in muscle fatigue, cramps and a higher risk of injury, as follows:
  - Inflammation of the joints (arthritis)
  - Inflammation of the tendon sheaths (tendinitis or peritendinitis)
  - Inflammation of the attachment points of tendons
  - Deterioration of the joints (chronic arthroses)
  - Painful hardening (induration) of the muscles
  - Intervertebral disc problems

### **Adaptive muscle changes**

- Non neutral positions cause some muscles to function at a shorter or longer than optimal length.
- Physical changes to muscle length occur when they are held in non-neutral positions for prolonged periods.
- These muscle changes can cause joints to function improperly as the muscles are no longer supporting and contracting correctly.
- Muscles that are decreased in length can show tenderness and trigger points, i.e. knots in muscles.
- Mechanical irritants, i.e. abnormal postures, can stimulate trigger points and create local discomfort or distally referred pain. Meaning pain can occur at the site of the injury, or at a point further away, i.e. a trigger point in the shoulder can manifest as a pain at the elbow.

### **Breaks, micro-breaks, stretch breaks**

- The seated posture is an ergonomic hazard in itself, even when sitting with well-adjusted lumbar support, therefore one of the best ergonomic interventions is to limit the exposure.
- Limit time spent seated to no more than one hour without a break.
- Organize work tasks to allow for a variety of seated and standing tasks throughout the day.
- Use a ringing phone as a cue to stand up and take a few steps.
- Adjust the angle of chair pan and backrest tilt throughout the day for variety.
- Mini-breaks (2-5 minute sessions of stretching), when interspersed throughout the day, are effective in preventing the gradual build-up of muscular strains that may lead to physical discomfort.