



Office Ergonomics Standard

This standard outlines general workstation and work practices to be followed in order to reduce the risk factors for developing musculoskeletal injuries (MSIs) and visual strain from working at computer workstations.

Under the Ontario Occupational Health and Safety Act (OHSA), there is no specific “ergonomics” regulation for computer-related tasks. However, the general duty clause (section 27(2)c) under the OHSA states that a supervisor must “take every precaution reasonable in the circumstances for the protection a worker”.

This standard is based on the *Canadian Standards Association (CSA) Z412-00: Office Ergonomics* standard and on widely accepted “best practices” which are considered prudent for the avoidance of ergonomic-related injuries and losses. Key elements of the Ministry of Labour published guideline entitled “*Computer Ergonomics: Workstation Layout and Lighting*” has also been adopted in this standard to ensure legislative compliance.

Scope

This standard applies to University of Toronto employees who perform moderate and/or intensive computer work. This standard is optional for Departments/Faculties in which workers perform light computer work.

Definition

- **Light computer user**: an individual who regularly uses the computer for less than 3 hours per day
- **Moderate computer user**: an individual who regularly uses the computer between 3 and 5 hours per day
- **Intensive computer user**: an individual who regularly uses a computer for more than 5 hours per day

Responsibilities

Supervisors shall:

- Identify all moderate and intensive computer users;
- Ensure that moderate and intensive computer users, under their authority, are accommodated in accordance with the requirements of this standard;
- Ensure that all moderate and intensive computer users are informed regarding acceptable work postures and habits and also the proper adjustment of the work station and accessories; and
- Encourage all computer users to discuss ergonomic concerns with the supervisor.



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Workers shall:

- Use and adjust workstations and accessories to accommodate individual needs;
- Apply the principles of good working posture and work habits; and
- Discuss ergonomic concerns with the supervisor.

Office Ergonomics Requirements for Moderate and Intensive Computer Users

1. Office chair

An office chair should have the following features in order to support proper postures and to accommodate the work surface and tasks performed:

Seat height

- Seat height should have an adjustment range of 380-510 mm.
- Users should adjust seat height so that:
 - Feet flat are on the floor (option: footrest)
 - Thighs are parallel to the floor
 - Knees are approximate 90°

Seat pan

- Seat pan should have rounded edges.
- When seated, seat pan depths should not press on the back of the knees or thighs. There should be approximately 2-3 finger widths of space between the edge of the seat pan and the back of the knees.
- Some chairs have horizontal adjustment of the backrest which allows adjustment of seat pan depth - a good range of seat pan depth is 420-460 mm and it should adjust by at least 50 mm.
- Seat cushion should have minimal contouring to allow easy shifting of position.
- Avoid buttons or prominent seams which may cause localized pressure points.
- Seat pan width should be greater or equal to 450 mm.
- If no adjustability is provided for seat pan depth, and the seat is shared amongst individuals, the seat depth should be determined by the shortest person in the range.
- When the seat angle is adjustable, it should be adjustable to a minimum of 3 degrees forward and 4 degrees rearward from the horizontal position.

Backrest

- Backrest must provide good contact and support for the lumbar region of the user's back.
- Backrest should be vertically adjustable by at least 50 mm within the range of 150 to 250 mm above the seat.
- Non-adjustable lumbar support should fall within the range of 150 mm to 250mm above the seat.
- Backrest cushion width shall not be less than 350 mm.
- If adjustable, the backrest angle shall be adjustable a minimum of 10 degrees within a range of 93 to 113 degrees and lockable at various positions within the backrest adjustment range.
- If fixed, the backrest angle should not be less than 93 degrees nor greater than 103 degrees.



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- Suggested ratio for the tilt mechanism is not less than 1.5:1, so that the backrest reclines at least 1.5 degrees when the seat reclines at 1 degree: Within this tilt range the chair should be lockable in various positions.

Armrests

- Armrests should be adjustable in both the horizontal and vertical planes and should not impede access to the work station or arm movement.
- If armrest height is fixed, it should be within the range of 190 – 250 mm.
- If armrest height is adjustable, it should be adjustable at least 50 mm including the 190 to 240 mm range.
- Armrests should be set back at least 150 mm from the edge of the seat.
- Armrests should be padded to provide light arm support.
- Armrests should have a length no less than 180 mm and a width no less than 45 mm.
- The inside distance between armrests should not be less than 450 mm.

Chair base

- Chair should have five prongs for stability.
- Chair prongs should have casters for mobility.
- Casters should be appropriate for the floor surface (i.e. hard casters for soft floors or soft casters for hard floors).

2. Computer Work Station

Computer desk

- Work surfaces should be chosen to complement the user(s) and the task being performed and be able to accommodate the tools and space required.
- Place frequently used items such as a telephone or files within easy reach and avoid frequent overhead reaches or situations that require twists and reaches behind the body.
- Arrange office items to minimize lifting, reaching, twisting or carrying.
- Fixed height work surfaces should have a height be between 705 mm to 755 mm from the floor.
- For adjustable height work surfaces, the height range should include 660-810 mm and should be adjustable in increments of no more than 25 mm.
 - Minimum work surface depth of 400 mm is suggested for writing tasks and should be higher for computer tasks depending on the depth of the computer monitor.
 - Work surface height should provide adequate clearance for the user's legs when seated in his or her most comfortable sitting position.
 - Minimum depth clearance for knees is 432 mm and 598 mm at the floor level.
 - Minimum vertical clearance under the desk is 636 mm and 680 mm at the front edge of work surface.
 - Minimum width clearance under the desk is 502 mm.

Computer monitor

- Computer screen should be positioned such that the top of the screen is about eye level or slightly lower.
- Individuals who wear bifocals and trifocals who look at the screen through the bottom half



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their eyeglasses may need to place the monitor lower (2-4 inches below eye level) to maintain a neutral neck posture.

- Computer screen should be located directly in front and centered to the user's body
- Monitor viewing distance should be between 400 and 740 mm away when seated comfortably in front of the keyboard. A general guideline is to set the monitor at an arms length away.
- Users with more than 1 computer screen should place the monitors as close together as possible to minimize twisting in the neck.

Keyboard and mouse

- Place keyboard directly between the user and the computer screen. The 'B' key should line up with the centre of the user's body.
- Place mouse next to and at the same height as the keyboard to avoid excessive arm extension.
- Forearms, wrists and hands should be parallel to the floor.
- The surface of the keyboard should generally be lower than a typical writing surface to permit the best posture. Use keyboard/mouse trays if required.
- For under-desk keyboard/mouse trays, an adjustment range of 635-735 mm will allow most people to adopt a suitable arm posture for repetitive keying.
- If a single fixed work surface is used, a work surface height of 730 mm is commonly recommended.

3. Computer Accessories

Document holders should be available for prolonged reading of documents to prevent bending of the trunk and neck.

- Document holder should be sloped (up to 75 degrees) or on the same plane as the computer monitor.
- Document holders that are to be placed at the same height as the monitor should be height-adjustable.
- Document holder should be of a size that is preferably slightly smaller than the size of the documents in both directions, to allow easy manipulation of documents.
- Angle board or in-line document holders could be used if writing on documents is required
- Depending on how a document is used, a document holder may be placed on either side of the computer monitor or it may be more effective if situated directly in front of the user, between the keyboard and monitor.

Foot rests should be provided if feet cannot rest comfortably on the floor while seated at the work station.

- If the legs are often stretched out, an angled foot rest with a range of 0-30 degrees can be used.
- Width of the footrest should be large enough to support both feet spaced 120 mm apart, and minimum dimensions of 300 mm wide and 300 mm deep.

Wrist or palm rests help maintain straight wrist posture between keyboarding activities. They should be made available on request.



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- These devices must not be actively used during keyboard/mouse work (i.e. do not press wrist onto the device) but rather to "rest" the wrists periodically during pauses from typing.

Adjustable under-desk keyboard/mouse support trays should be used if the work surface cannot properly accommodate a keyboard/mouse and monitor (i.e. the surface is too high or too shallow).

Monitor risers or blocks should be used to increase the height of the monitor if the monitor is too low.

Telephone headsets should be provided if telephone use is a major component of the job (e.g. reception areas), especially in combination with computer work.

- For individuals who uses the telephone less frequently, a telephone handset attachment, or a hands-free device is an excellent alternative to minimize crunching the handset between the ear and shoulder.

4. Posture and Work Habits

Sitting posture

- Center the body directly in front of the monitor and workstation.
- Keep the neck and shoulders relaxed and elbows close to the body.
- Avoid hunching or raising the shoulder.
- Forearms, hands and wrists should be kept parallel to the floor and in a non-reaching position.
- When using a mouse device, avoid pressing the wrist on the work surface and relying on the wrist to move the device; instead, use the large muscles in the upper arm to move the device.
- Avoid applying excessive hit or grip force when typing or using a pointing device.
- When seated, thighs should be parallel to the floor with feet firmly support on the floor (or foot rest). Knees should be bent at 90°.
- Maintain a neutral back posture with the lower back (lumbar region) supported by the chair.
- Avoid reaching, bending or twisting postures (e.g. do not reach behind, do not bend wrists, do not twist upper torso, etc.). Instead, move the entire body to get hold of objects.
- If possible, alternate sitting posture and tasks to reduce stresses on commonly used body parts.

Breaks

- Take frequent visual breaks by glancing away from the monitor and focusing on a distant object for 10-15 seconds for every 30 minutes of computer use.
- Take a 5 minute break for every hour of keyboard/mouse activity. The break should involve performing a non-computer related task such as photocopying, returning phone calls, etc, or simply standing up to stretch, move around and change body posture.



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5. Lighting

Illumination for computer work stations should be set up to provide the right level of light for the task and to minimize glare and visual discomfort. Computer work requires lower overall light levels than paper-oriented desk work.

Glare is caused by large differences in light levels within the visual field and should be minimized.

- Position computer work stations between rows of overhead lights rather than directly below.
- Position computer work stations at right angles to windows such that the operator does not face a window or have their back to a window.
- Utilize partitions to block light from windows and overhead lights.
- Ensure that windows have coverings such as venetian blinds or drapes so that light levels can be controlled.
- If overhead lights are too bright, request that the some of the overhead light bulbs be removed in the vicinity of computer stations - Contact Facilities and Services or Physical Plant.
- Parabolic louvres, baffles or filters on overhead lights can help reduce glare.
- Tilt the monitor slightly downward to reduce reflection from overhead lights.
- Work surfaces should be kept matte to reduce glare and reflection.

6. Comments Regarding the Use of Laptops

Short-term, infrequent use of laptops is usually not problematic but if a laptop is being used in one location for extended periods of time, a separate monitor or keyboard and mouse should be provided at that location. In addition, the recommendations listed above also apply to laptop users. If the laptop is regularly transported over long distances, a small cart or dolly should be used to reduce the load on shoulders.

Further Information:

CSA-Z412-00 (R2016) Guideline on Office Ergonomics (Canadian Standard Association) - Can be accessed through: <http://ohsviewaccess.csa.ca/>

Computer Ergonomics: Workstation Layout and Lighting (Ontario Ministry of Labour) – Can be accessed through the Ministry of Labour website: <http://www.labour.gov.on.ca/>

Rest Breaks for Computer Operators, Health and Safety Guidelines. Professional and Specialized Services, Occupational Health and Safety Branch, Ministry of Labour, May 2005 – Can be accessed through the Ministry of Labour website: <http://www.labour.gov.on.ca/>

Musculoskeletal Disorders Prevention Series (Occupational Health and Safety Council of Ontario) – Can be accessed through the Workers Safety Insurance Board website: <http://www.wsib.on.ca/>
Office Ergonomics Standard (University of Toronto)
<http://www.ehs.utoronto.ca/services/Ergonomics/ergostd.htm>