

Evaluating your computer workspace

How to make it work for you



Oregon
OSHA

A Division of the
Department of Consumer
and Business Services

About this document

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Questions or comments?

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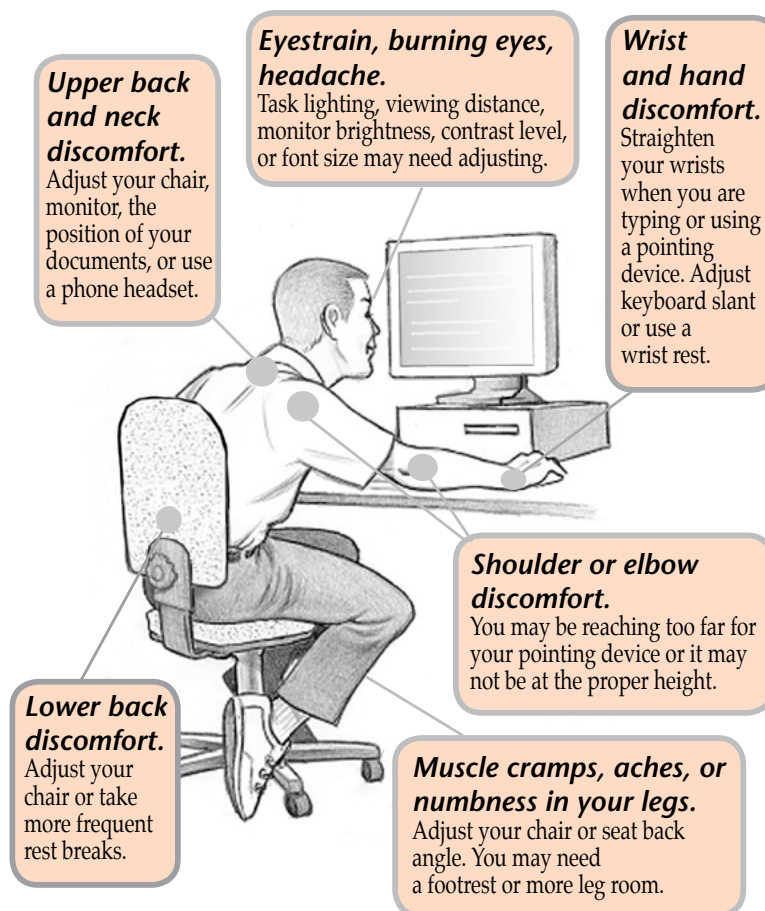
Introduction

How is your computer workspace treating you?

Your computer workspace includes your computer and the things you use around it. How you set up and use your workspace can make a big difference in how you feel at the end of the day.

Dry eyes, sore muscles, and fatigue are all symptoms of prolonged computer use. Usually, it doesn't take long for them to develop. Some symptoms such as dry eyes or a minor headache may just be annoying. Some symptoms may eventually fade away; however, they could develop into chronic conditions such as carpal tunnel syndrome (injury to nerves in the wrist), tendinitis (swelling of the tendons) in the wrist or elbow, or tenosynovitis (swelling of the sheath around a tendon).

**Do you have some of the aches and pains described below?
Proper workspace layout can prevent them.**

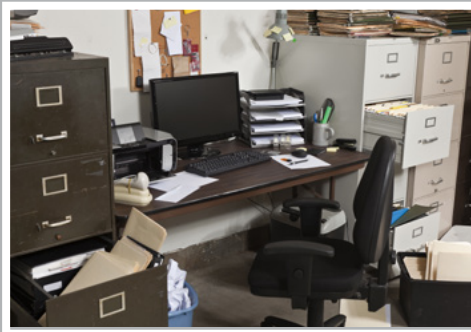


Computer work that makes you feel uncomfortable is usually caused by:

- **Repetitive movements.** Do you type for long periods without rest?
- **Awkward posture.** Is your neck, or your wrist, bent at a sharp angle?
- **Static posture.** Do you sit for long periods without getting up or stretching?

Examples of unfriendly computer work spaces.

Working at a computer may not always be exciting but it doesn't have to be uncomfortable.



How is your computer workspace treating you?

Evaluating your computer workspace

This guide helps you set up and use your computer workspace so that you are productive and comfortable.

Your work surface

Select a stable, adjustable work surface that has a separate adjustable keyboard platform. If you can't adjust the height of your work surface, you should be able to adjust the height and angle of the keyboard platform. One that isn't adjustable may position you too far from the work surface.

Your work surface should have a matte finish to reduce glare. Beneath the surface there should be ample room for your legs – nothing to obstruct knees, legs, shins, or thighs.

Your work surface should be large enough to accommodate materials that you use often and permit a full range of motions for tasks – about 16 inches in front of you or to your side.

Use overhead shelves, filing cabinets, and desk drawers for items that you use infrequently. Avoid storing items under your desk; they can take up leg space or strain your back when you retrieve them.



Use overhead shelves, filing cabinets, and desk drawers for items that you use infrequently.

Your chair

Your chair must be comfortable and appropriate for the work that you do. The four key parts of a chair that affect its comfort are:

The base

Stability is critical. Select a chair that has a five-point base.

The seat pan

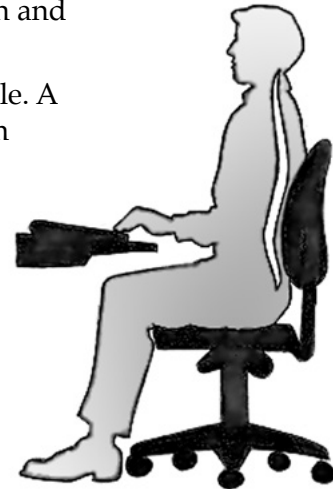
The ideal seat pan allows two to three fingers' width (3-3.5 inches) from the front edge of the seat pan to the back of your lower leg at the knee when your back touches the backrest.

Hard, unpadded seat pans are uncomfortable to sit on for more than an hour. Soft, deeply padded seat pans cause you to sink in too far; they shift pressure from the buttocks to surrounding tissues. The result is tension in the hip muscles.

The front edge of the seat pan should have a softly padded, rounded front edge (called a waterfall edge). Straight, unpadded edges compress thigh tissue and restrict blood circulation, which can cause pain and numbness in your legs.

The seat pan fabric should be porous and breathable. A slippery seat pan will cause you to slide away from the backrest and provide little back support.

The angle of the seat pan should be adjustable so that you can achieve a comfortable posture. You should also be able to adjust the height of the seat pan so that your feet rest flat on the floor. Your forearms should be horizontal and at right angles to your upper arms. Your elbows should just clear the top of the work surface.

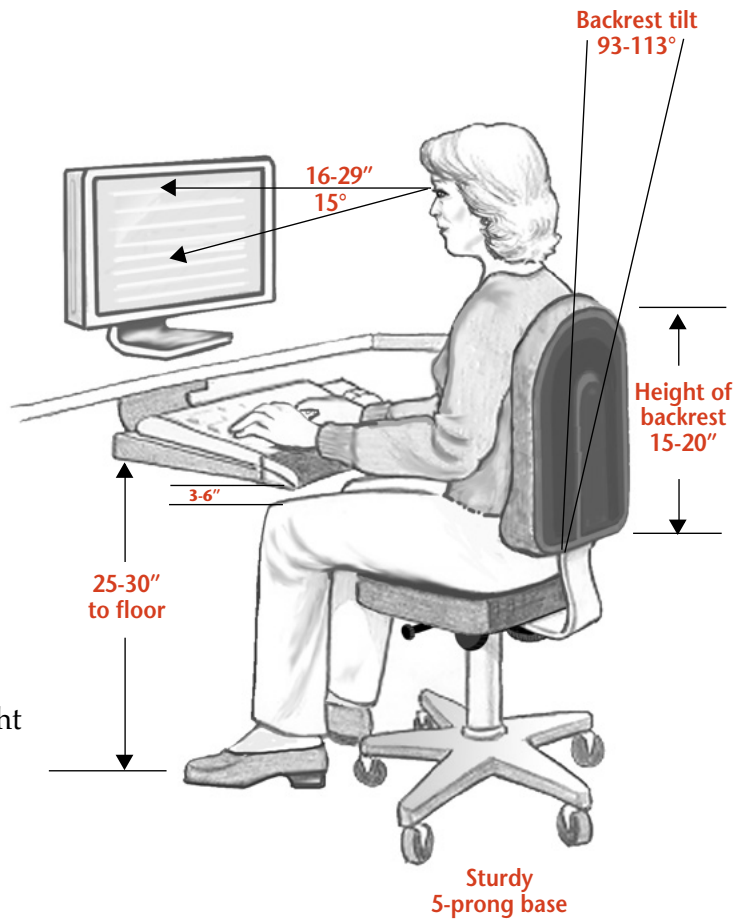


The lower part of the backrest should support the curve of your lower back.

The backrest

The backrest should be large enough to support your entire back, but not so large that it interferes with your arms: 15 to 20 inches high and 13 inches wide is preferable.

The backrest should be adjustable and contour to the curve of your lower back. Most computer users tend to sit in an upright or slightly forward posture. Adjust the angle so that the backrest touches your back.



The armrests

Armrests should be adjustable and should not interfere with your work surface. You should be able to move close to your work without losing support from the backrest. Your forearms should rest comfortably on the armrests, with your shoulders relaxed.

If the armrests are too high, they will elevate your shoulders and cause stiffness or pain in the shoulders and neck; if they are too low, they cause you to slump and lean to one side.

Remove armrests if you don't use them, if they interfere with your tasks, or if they cannot be properly adjusted.



Your keyboard

When you are using a keyboard, your wrists and forearms should be relatively straight and your hands should be at or just below elbow height. Shoulders should be relaxed, elbows close to your body.

Your keyboard should be thin, which will help keep your wrists straight. The keyboard platform should be adjustable.

Keyboards can be fitted with palm rests that support your hands, minimize contact with table edges, and help keep your wrists straight. Make sure the palm rest supports your palms – not your wrists.

Alternative keyboard designs are also available. Some computer users feel that these keyboards reduce typing fatigue; however, they are not effective for all users. Chair height and adjustable work surfaces are more important than an alternative keyboard.



Alternative keyboards:
Split and left-hand numeric keypad.

X incorrect position



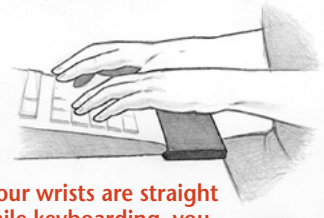
Don't bend your wrists up (shown) or down while keyboarding.

✓ correct position



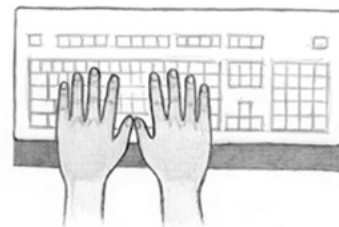
Your wrists should be straight while keyboarding.

✓ correct position



If your wrists are straight while keyboarding, you decrease the risk of injury.

✓ correct position



A palm rest – like the one shown here – can support your palms and wrists during rest periods from keying. Make sure you place the palm rest under your palms, not your wrists.

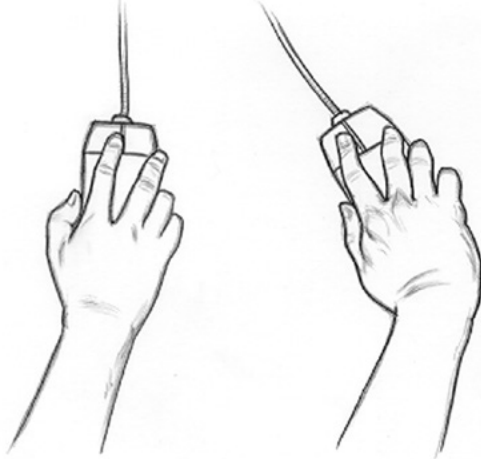
Courtesy of the Workers' Compensation Board of British Columbia. Illustrations used with permission.

Your mouse and other pointing devices

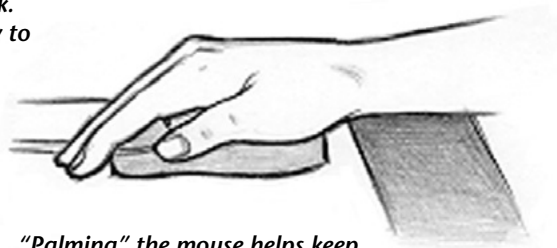
Your mouse – or a pointing device such as a touch pad – should be at the same height as the keyboard and adjacent to either side of it. Your arm should be close to your body for support. Your hand, wrist, and forearm should be reasonably straight and slightly above the mouse.

A palm rest can help support your hands and keep your wrists straight.

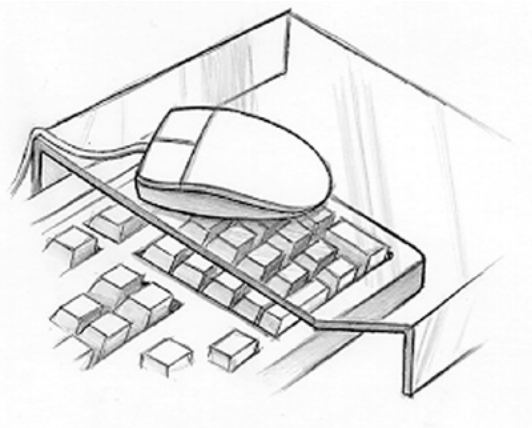
✓ **correct position** ✗ **incorrect position**



Keep your wrist straight during mouse work. Don't bend your wrist from side to side. Try to move your whole arm, instead.



"Palm resting" the mouse helps keep the wrist straight and reduces the small-wrist motions.



If you don't use the 10-key pad on your keyboard, consider a mouse bridge to reduce reaching for the mouse.

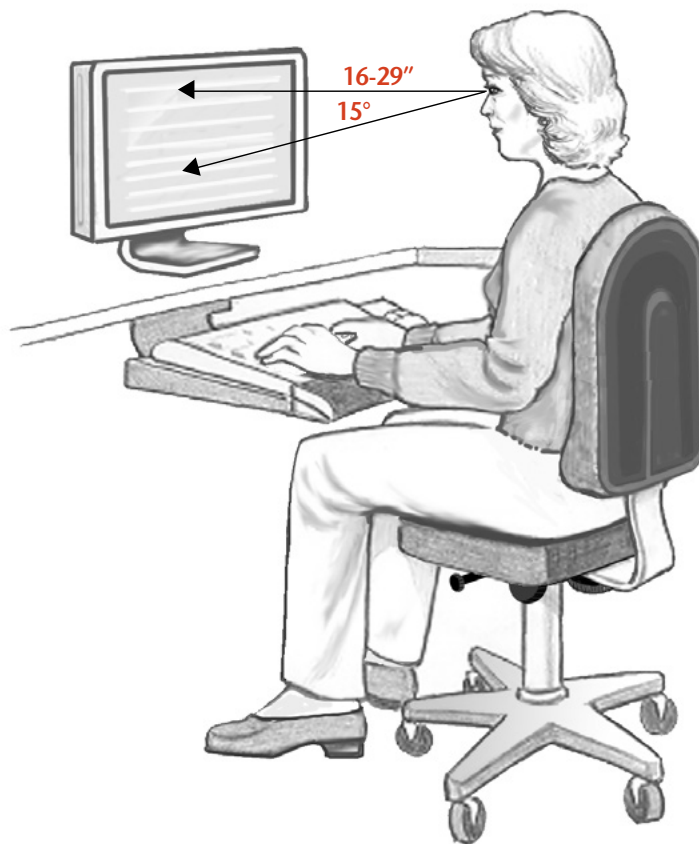
Courtesy of the Workers' Compensation Board of British Columbia. Illustrations used with permission.

Your display

The topmost active line of your display should be at or slightly below eye level. The topmost active line is the first line that you typically look at, not the top line of the status bar. The area of the screen that you look at most often should be about 15 degrees below eye level. The distance between your eyes and the screen should be about an arm's length (16-29 inches) when your neck is straight.

If you wear bifocal, trifocal, or progressive lenses, you may want to position the display lower to avoid tilting your head back. Displays that swivel horizontally and tilt vertically enable you to achieve the best viewing angle.

Regular screen cleaning also helps keep text and images clear.



Desk phone

If you frequently use a desk phone, place it close to you so you don't have to reach across the work surface for it; use a headset if you have a tendency to cradle the phone between your ear and shoulder.

✓ correct position



✗ incorrect position



If you use your phone frequently, use a headset to reduce awkward neck postures.

Document holder

The document holder should be stable and adjustable. Place the document holder close to your screen and at the same height and viewing distance (or between the keyboard and the monitor) to reduce head, neck, or back strain as you look from screen to document.



When entering data from a large document, prop the document up in front of you.



If you need to look back and forth between your monitor and a document, place your document on a document holder, close to and at the same height and viewing distance as your screen.

X incorrect position

Typing from documents placed to your side can cause awkward trunk or neck postures.



Footrest

When you sit in a properly adjusted chair, your feet should be flat on the floor. If not, support them with an angled (no more than 30 degrees) footrest that doesn't restrict leg movement. The footrest should be:

- Stable, portable, incline-adjustable
- Large enough to support the soles of both feet
- Covered with nonslip material

Don't use your chair base as a footrest.



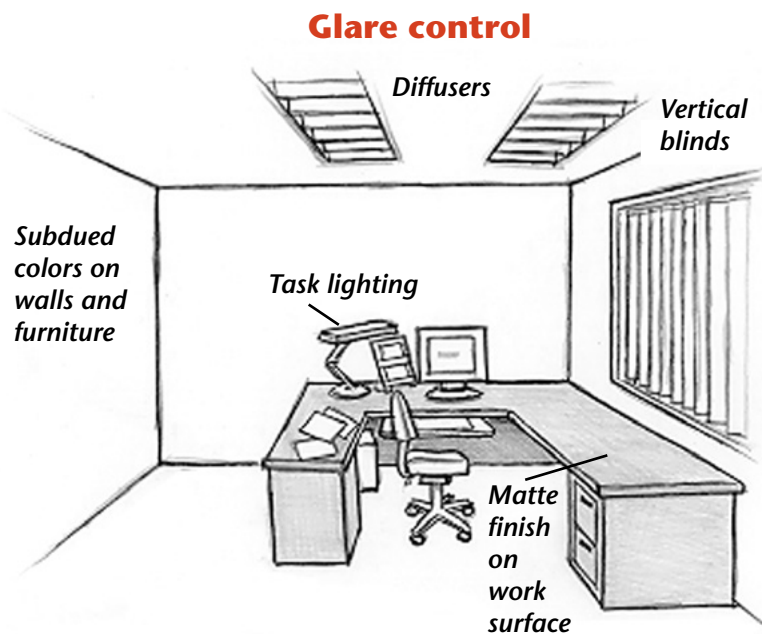
Illumination

Computer workspaces should have lower light levels than other office spaces. Illumination should be 20-50 lumens per square foot for screen viewing and 50-70 lumens per square foot for reading printed documents. (Lighting brightness is commonly measured in lumens.) The best way to measure illumination is with a light meter.



Your workspace should be located away from and at right angles to windows; windows should have adjustable blinds or drapes to reduce glare and eye fatigue. (Vertical blinds reduce glare more effectively than horizontal blinds.) Walls, furniture, and equipment near a display or display screen should have nonreflective, subdued colors to minimize glare.

Light fixtures near computers should have diffusers, cube louvers, or parabolic louvers to reduce glare. Workspaces should be spread out between rows of overhead lights to reduce glare and reflection.



Temperature, humidity, and static electricity

Set thermostats to keep the temperature between 68 and 72 degrees. Relative humidity should be 40 percent to 60 percent. Consider using antistatic floor mats in spaces where the humidity is below 40 percent.



Mobile devices

People tend to bend their heads forward when they use laptops, iPads, tablets, and cellphones. Over time, that posture can put them at risk for chronic neck and shoulder pain. Cellphone users who write long blocks of text also are also stressing their thumbs, fingers, and hands.

Laptops

If you use a laptop for prolonged periods:

- Use a standard-sized keyboard and mouse with the laptop.
- Place the keyboard and mouse at a comfortable height on the work surface. (Your hands should be at or just below elbow height; wrists and forearms should be relatively straight, slightly above the keyboard.)
- Place the laptop on a platform or riser so that the display is at a comfortable height (the area of the screen that you look at most often should be about 15 degrees below eye level).



Laptop monitor riser

A laptop riser makes screen viewing more comfortable and allows room for a standard-sized keyboard.

iPads and tablets

- Use a cover that lets you adjust the device to a 45-degree angle.
- Use a Bluetooth keyboard if you need to type for prolonged periods.

Cellphones

- Use a Bluetooth headset so that you don't have to hold your phone up to your ear for prolonged periods.
- Avoid typing long blocks of text on your phone. Use a laptop or a desktop computer instead; they are more efficient and put less stress on your thumbs.
- Also, consider using the word prediction and voice recognition tools on mobile devices to compose short blocks of text.

Sit-stand workstations

Should you use a sit-stand workstation?

If you are uncomfortable when you sit for less than 30 minutes, a sit-stand workstation might help you. Also, being able to move between sitting and standing positions can help you maintain comfortable working postures throughout the day.

What makes a good sit-stand workstation?

- Its components are easy to adjust.
- It has a height-adjustable work surface and an adjustable keyboard platform that will fit sitting and standing users.
- It has a display platform or arm that allows the top of the display to be set at the same height as the user's eyes.
- It permits a keyboard and mouse to be at the same height, at or slightly below the elbows.



Sources of discomfort and how to prevent them

Back pain

Chair lacks lower-back support

The normal alignment of the spine is an S-shaped curve – an inward curve at the neck, an outward curve in the middle of the back, and an inward curve at the lower back.

When a chair does not provide lower back support, the lower curve of the back flattens. As a person sits, the bottom of the hip bone contacts the chair first. The hip rotates, flattening the curve in the lower part of the back, and the spinal discs stretch from the vertebrae causing back pain.

What to do

- Use a chair that has good low-back support and an adjustable backrest and seat pan. A slight backward tilt of the backrest helps reduce the flattening of the lower spine. Adjust the seat pan angle so that the chair feels comfortable when you are sitting.

Chair is too soft or too hard

If your chair is too soft, you sink into the seat pan, which restricts your movement and causes thigh, buttocks, and lower back fatigue. When your chair is too hard, it will feel uncomfortable and you will need to change postures frequently to relieve thigh and buttock discomfort.

What to do

- Try out different chairs with similar features and select the one that feels most comfortable.



Back

- *Hold your arms straight in front of you and stretch them forward. Raise your arms above your shoulders and stretch them upward.*
- *Sit relaxed, feet flat on the floor. Imagine a cable attached to the top of your head pulling you up. Hold for a count of three, then relax. Repeat three times.*

Display is too low

When your display is too low, you tend to bend your head forward, slouch, or lower your chair to improve viewing. Tilting the display up too much can increase glare from overhead lighting.

What to do

- Raise the display; the topmost active line of text displayed on the screen should be at or just below your eye level.

Neck pain

Display is too high or too low

A display that is too high or too low will cause you to bend your neck backward or forward to read text on screen. If you wear bifocals, trifocals, or progressive lenses, you may also tilt your head back to read through the bottom portion of the lenses.

What to do

- Adjust the display so that you don't have to bend your neck or tilt your head to read text.

Documents are placed incorrectly

Documents placed flat and off to the side of the work surface cause forward bending and twisting of the neck and trunk.

What to do

- Use an adjustable document holder. Position it close to and at the same height and viewing distance as the display screen – or between the keyboard and display if space is available.
- The display and document holder should be close together and the same distance from your eyes so that you can look from screen to document without excessive neck or back movement.



Neck

- *Move your head back as far as it will go, keeping your head and ears level. Next, move your head forward. Repeat three times.*
- *Shrug your shoulders, raising them for a count of three, then lowering them. Rotate your shoulders backward, arms relaxed at your sides. Repeat three times.*

Shoulder pain

Arms are too high or too low

Working with your arms at the wrong height can cause shoulder pain. When your arms are too high, they pull your shoulders up, straining shoulder and back muscles. When your arms are too low, they pull your shoulders down, putting pressure on the shoulder and back muscles and compressing nerves in the neck and arms.

What to do

- Adjust your keyboard or your chair so that your hands are at or just below elbow height; wrists and forearms should be in a straight line, slightly above the keyboard. Your shoulders should be relaxed, your elbows next to your body.
- Remove the armrests if you can't adjust them to a comfortable height; if they are permanently attached to the chair, replace the chair with one that has adjustable armrests.
- Position your mouse next to your keyboard so that your shoulders are relaxed, your wrists are straight, and your elbows are by your side. If you don't use the 10-key portion of your keyboard, consider a mouse bridge, a simple platform that rests over the keypad. Using the mouse on the bridge reduces the need to reach for the mouse.



Shoulders

- *Squeeze your shoulder blades together with your elbows lifted away from your body. Imagine you have a pencil between your shoulder blades and you are trying to trap it and then release it.*

Forearm, hand, and finger pain

Hands are not aligned with forearms

You can have discomfort in your hands and arms if they are not aligned properly when you are typing.

Some keyboard users support their wrists on the work surface as they type. This can cause backward bending of the wrist and pressure on the wrists and palms.

What to do

- Use a thin keyboard to keep your hands in line with your forearms. Adjustable keyboard platforms also make correct hand and wrist posture easier to achieve.
- Choose work surfaces that have round edges or use a palm rest. A palm rest will support the heel of your hand and minimize wrist bending.

Holding and moving your mouse incorrectly

Holding your mouse too tightly or resting your wrist on the edge of the work surface can also cause pain in your hands or fingers.

What to do

- Keep your wrist straight when you move your mouse.
- Use a palm rest to support your hand.
- Use less force to hold the mouse.
- Alternate mouse commands with key commands.
- Position the mouse on the other end of the keyboard and operate it with your other hand. (Some mice are designed to be used with either hand.)
- Try a different input device — one that positions your shoulder, arm, hand, and wrist more comfortably than a mouse.



Wrist and hands

- *Clench your fists, then release them, spreading out your fingers. Hold each position for a count of three.*
- *In a sitting or standing posture, drop your arms to your side. Gently shake out your arms and hands.*

Leg pain

Edge of the seat pan presses against the thighs

Straight, unpadded seat pan edges compress thigh tissue and restrict blood circulation, which can cause pain and numbness in the legs.

What to do

- Adjust the seat pan height so that your feet are flat on the floor; use a footrest if your feet aren't flat on the floor. The ideal seat pan length allows two or three finger widths from the front edge to the back of your knee.

Excessive knee bending

Avoid using the base of your chair as a footrest. Doing so can cause your knees to bend too much.

What to do

- Adjust the height of the chair so that your feet rest flat on the floor. Use a footrest, if necessary.



Lower back

- *From a seated posture, lift your leg, leaving your knee bent slightly. Rotate your ankle slowly. Point your toes and then pull them toward your shin.*
- *Stand up and take a short walk.*

Vision problems

Burning eyes, blurred vision, irritated eyes, and headaches

Eyestrain and headaches are common symptoms of prolonged computer use.

What to do

- Take a three- to five-minute rest break for each hour of continuous computer work. Get up and stretch, move, or do other work. Periodically focusing on distant objects also relaxes eye muscles. The minimum distance from your eyes to the screen should be 16 inches.
- When getting fitted for glasses, tell your eye-care specialist that you do computer work. The size of your display screen, the distance from your eyes to the screen, average hours per day that you spend using a computer, and the tasks that you do on the computer are factors that may determine the glasses you need.
- If you wear bifocals, trifocals, or progressive lenses, adjust the height of the display so that you don't have to tilt your head back.

Fatigue

The two best ways to recover from prolonged computer use are easy to do and free.

Move. Take a three- to five-minute break after each hour of computer work.

Stretch. Daily stretching exercises can help reduce muscle tension and eyestrain.



Other Resources

Oregon Institute of Occupational Health Sciences

- Office ergonomics: www.croetweb.com/links.cfm?topicID=28

Ergoweb

- ergoweb.com

Office-Ergo

- office-ergo.com

The National Institute for Occupational Safety and Health (NIOSH)

- Ergonomics and musculoskeletal disorders: www.cdc.gov/niosh/topics/ergonomics

Washington State Department of Labor & Industries

- Office ergonomics: www.lni.wa.gov/safety/trainingprevention/online/courseinfo.asp?P_ID=184

Oregon OSHA Services

Oregon OSHA offers a wide variety of safety and health services to employers and employees:

Appeals

503-947-7426; 800-922-2689; admin.web@oregon.gov

- Provides the opportunity for employers to hold informal meetings with Oregon OSHA on concerns about workplace safety and health.
- Discusses Oregon OSHA's requirements and clarifies workplace safety or health violations.
- Discusses abatement dates and negotiates settlement agreements to resolve disputed citations.

Conferences

503-378-3272; 888-292-5247, Option 1; oregon.conferences@oregon.gov

- Co-hosts conferences throughout Oregon that enable employees and employers to learn and share ideas with local and nationally recognized safety and health professionals.

Consultative Services

503-378-3272; 800-922-2689; consult.web@oregon.gov

- Offers no-cost, on-site safety and health assistance to help Oregon employers recognize and correct workplace safety and health problems.
- Provides consultations in the areas of safety, industrial hygiene, ergonomics, occupational safety and health programs, assistance to new businesses, the Safety and Health Achievement Recognition Program (SHARP), and the Voluntary Protection Program (VPP).

Enforcement

503-378-3272; 800-922-2689; enforce.web@oregon.gov

- Offers pre-job conferences for mobile employers in industries such as logging and construction.
- Inspects places of employment for occupational safety and health hazards and investigates workplace complaints and accidents.
- Provides abatement assistance to employers who have received citations and provides compliance and technical assistance by phone.

Public Education

503-947-7443; 888-292-5247, Option 2; ed.web@oregon.gov

- Provides workshops and materials covering management of basic safety and health programs, safety committees, accident investigation, technical topics, and job safety analysis.

Standards and Technical Resources

503-378-3272; 800-922-2689; tech.web@oregon.gov

- Develops, interprets, and gives technical advice on Oregon OSHA's safety and health rules.
- Publishes safe-practices guides, pamphlets, and other materials for employers and employees
- Manages the Oregon OSHA Resource Center, which offers safety videos, books, periodicals, and research assistance for employers and employees.

Need more information? Call your nearest Oregon OSHA office.

Salem Central Office

350 Winter St. NE, Room 430
Salem, OR 97301-3882

Phone: 503-378-3272
Toll-free: 800-922-2689
Fax: 503-947-7461
en Español: 800-843-8086
Web site: osha.oregon.gov

Bend

Red Oaks Square
1230 NE Third St., Suite A-115
Bend, OR 97701-4374
541-388-6066
Consultation: 541-388-6068

Eugene

1140 Willagillespie, Suite 42
Eugene, OR 97401-2101
541-686-7562
Consultation: 541-686-7913

Medford

1840 Barnett Road, Suite D
Medford, OR 97504-8250
541-776-6030
Consultation: 541-776-6016

Pendleton

200 SE Hailey Ave.
Pendleton, OR 97801-3056
541-276-9175
Consultation: 541-276-2353

Portland

Durham Plaza
16760 SW Upper Boones Ferry Road,
Suite 200
Tigard, OR 97224-7696
503-229-5910
Consultation: 503-229-6193

Salem

1340 Tandem Ave. NE, Suite 160
Salem, OR 97301
503-378-3274
Consultation: 503-373-7819



440-1863 (12/16)



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