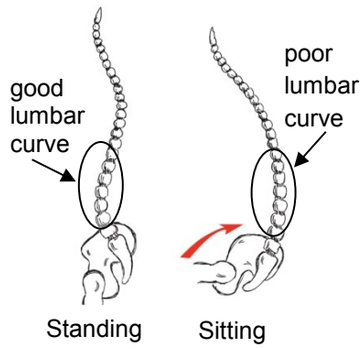
No. 233

Ergonomics: Hazards of the Seated Posture

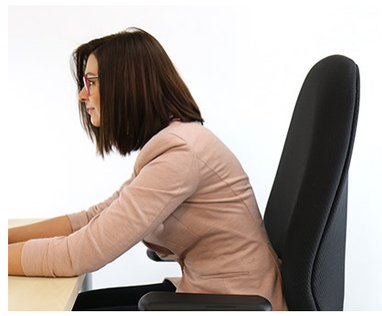
Potential Hazard

Seated posture causes the spine to lose its healthy curves and increases the stress placed on your back. Prolonged sitting increases the risk for stiffness, pain or injury.

Stress on your lower back: Your hips rotate when you move from a standing to a sitting position, which causes your lower back (lumbar region) to lose its inward curve. Your muscles are in a less efficient position to support your spine when you are seated, and unequal pressure is placed on your intervertebral discs. Sitting can significantly increase the pressure on the lower back when compared to standing.



Stress on your upper back and neck: An improperly adjusted workstation or chair, or sitting for prolonged periods, may lead to slouching. This posture creates a poor lumbar curve as well as a rounded upper back. This causes the head and shoulders to move forward and places more pressure on the upper back and neck. Symptoms such as muscle stiffness, pain, headaches and adaptive muscle imbalances can develop from slouching.



How to control the hazard

When standing tall, the spine is in its best and most natural position and displays a slight “S” curve. The muscles are well-positioned to support the spine, and the discs between the bones of the spine have uniform pressure placed on them.

Chairs or stools designed to support or promote a proper lower back (lumbar) curve will improve seated posture and reduce the stresses placed on the back. Whenever possible, try to avoid or reduce prolonged sitting.

Tips to reduce seated stress

- If you are sitting and your chair has a back support, the support should be adjusted to press into the lower back to maintain your inward lumbar curve, causing you to sit more upright.
- If your chair does not have a back support (e.g., if you are using a stool), try to sit upright as much as possible and fight the temptation to slouch.

(see over)

SAFE Work Manitoba contact information:
Winnipeg: 204-957-SAFE (7233)
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Publications and resources available at: safemanitoba.com

- If your seat has a poor lumbar support (e.g., if you are sitting in some types of vehicles), roll up a small towel to make a lumbar support for your lower back.
- Properly adjusted armrests on a chair can provide support for the weight of your arms and partial support for the weight of your upper body.
- If your chair has wheels, use them to move rather than twisting your torso and reaching.
- Take frequent breaks from sitting. Stand up, walk around or perform a few stretches. Use cues such as a ringing phone or a timer to remind you to get out of your chair. Stand up to retrieve binders or files on shelves above your desk, rather than reaching from a seated position.
- Adjust your work schedule to allow you to get up to perform various tasks throughout the day.
- Consider walking to or walking with a co-worker to discuss an issue.
- Drink a healthy amount of water so you will need to take restroom breaks.
- Consider a sit-stand stool if your work surface is higher or can be adjusted to be higher. These stools are designed to be taller and the seat can tilt forward, allowing a worker to “perch” on the edge of the stool in a close to standing position, which promotes a more natural back position.

Reference to legal requirements under workplace safety and health legislation:

- Musculoskeletal Injuries: Manitoba Regulation 217/2006 Part 8

Additional workplace safety and health information available at safemanitoba.com

- SAFE Work Bulletin 234: Office Ergonomics: Neck and Shoulder Hazards
- SAFE Work Bulletin 235: Office Ergonomics: Arm, Hand and Wrist Hazards
- SAFE Work Bulletin 264: Ergonomics: Adjusting Office Chairs and Workstations

Canadian Centre for Occupational Health and Safety:
www.ccohs.ca/oshanswers/ergonomics/office/

Revised: March 2018
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No. 234

Office Ergonomics: Neck and Shoulder Hazards

Potential Hazard

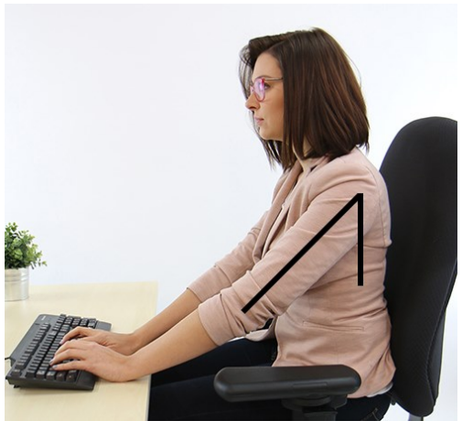
Office injuries usually develop gradually and often are not given attention until there is significant discomfort. The single largest factor in office injuries is poor working postures. While improper posture may not result in an injury after a week, a month or even a year, prolonged exposure to improper posture will increase the risk of developing an injury. This bulletin provides tips for preventing neck and shoulder injuries in an office environment.

How to control the hazard

Your risk for injury is low in a **neutral posture** because your blood flow and muscle length are normal. You are in a neutral posture when:

- your head is facing forward
- your chin is parallel with the floor
- your elbows and arms are at the side of your body
- your shoulders are back slightly.

Improper posture may increase the risk of injury. The following are some common hazards involving the neck and shoulders, and potential solutions for correcting your posture.



Hazard: **Shoulder flexion (reaching arms in front of the body)**

Holding this posture for long periods of time can disrupt blood flow to the muscles in your upper back, shoulders, arms and hands. This position can lead to rounded shoulders because the weight of the arms and position of the muscles pull the shoulders forward.

- Potential sources: Reaching forward to use a keyboard or a mouse.
- Potential solutions: Move your keyboard and mouse closer to you. Lower the height of your chair and move it closer to your desk.

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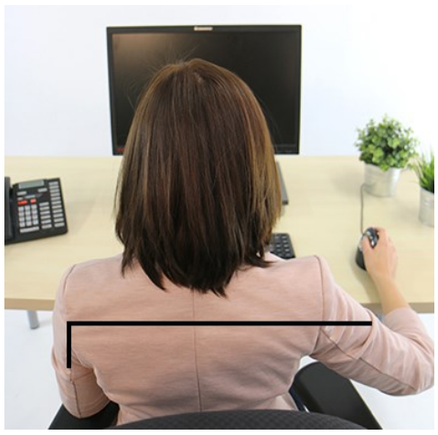
Hazard: Shoulder abduction (moving elbow out to the side of the body)



Holding this posture increases stress on your shoulders' soft tissues.

- Potential sources: Reaching for your mouse or other regularly used objects and materials, placing the mouse or keyboard too high, or the keyboard is too wide or not placed correctly.

- Potential solutions: Adjust your work's height or your chair's height. Use an alternative keyboard that allows you to place your mouse closer to you and keep frequently used items close to you.

Hazard: Rounded shoulders

This posture can cause imbalances in your chest, upper back and neck muscles, which may negatively affect the blood and nerve supply to the muscles in your shoulders, arms, forearms and hands.

- Potential sources: Using a keyboard, mouse or monitor that is placed too low or too far away. Working on a desk surface or a keyboard tray that is placed too low. Sitting on a chair that is too far away or not adjusted properly.

- Potential solutions: Adjust your monitor's height and distance. Move your keyboard and mouse closer and check that they are at elbow height (your elbow should be bent at approximately 90 degrees). Adjust your arm rests to support your forearms. Move your chair closer and adjust the settings.

Hazard: Internal shoulder rotation (rotation at the shoulder with the hand moving in front of the body)

This position increases pressure in the shoulder joint, and can affect the nerves and muscles in the shoulder area. Holding your muscles in this position can contribute to rounded shoulders.

- Potential sources: Using a keyboard that is too narrow for the user's shoulders, or using the pointing device on a laptop.

- Potential solutions: Use an external keyboard, an external mouse or an alternative keyboard design.

(see over)

Hazard: Neck extension (moving the chin away from the chest)

This posture places your cervical vertebrae in a non-neutral position. Holding your neck muscles in this posture can lead to muscle imbalances.

- Potential sources: Using a monitor that is placed too high or a chair that is positioned too low. Using bifocals while seated at the computer.
- Potential solutions: Position your monitor and chair at an appropriate height for you. Note that this height is different for bifocal versus non-bifocal users.

Hazard: Neck flexion (moving the chin towards the chest)

This posture places your cervical vertebrae in a non-neutral posture. Holding your neck and upper back muscles in this posture can lead to muscle imbalances.

- Potential sources: Using a monitor that is placed too low. Working on a laptop or tablet. Looking at documents that are placed on the working surface or at a document holder that is too low.
- Potential solutions: Position your monitor higher. Use an external keyboard and monitor for prolonged laptop use. Raise the height of your document holder.

Hazard: Neck rotation

This posture places your cervical vertebrae in a non-neutral position. Holding your neck muscles in this posture can lead to muscle imbalances.

- Potential sources: Using a monitor that is not placed directly in front of you. Looking at documents that are placed on the working surface or at a document holder that is improperly placed.
- Potential solutions: Place your monitor directly in front of you. Place your document holder into a proper position.

(see over)

Hazard: Neck abduction (tilting the head to one side)

This posture places your cervical vertebrae in a non-neutral position. Holding your neck and upper back muscles in this posture can lead to muscle imbalances.

- Potential sources: Using the telephone and both hands at the same time.

- Potential solutions: Maintain one hand on the phone at all times. Use a hands-free system (e.g., a speakerphone or a headset).

Reference to legal requirements under workplace safety and health legislation:

- Musculoskeletal Injuries: Manitoba Regulation 217/2006 Part 8

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- SAFE Work Bulletin 233: Ergonomics: Hazards of the Seated Posture
- SAFE Work Bulletin 235: Office Ergonomics: Arm, Hand and Wrist Hazards
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Canadian Centre for Occupational Health and Safety:
www.ccohs.ca/oshanswers/ergonomics/office/

Revised: March 2018
Last Reviewed/Revised: November 2010

No. 235

Office Ergonomics: Arm, Hand and Wrist Hazards

Potential Hazard

Office injuries usually develop gradually and often are not given attention until there is significant discomfort. The single largest factor in office injuries is poor working postures. While improper posture may not result in an injury after a week, a month or even a year, prolonged exposure to improper posture will increase the risk of developing an injury. This bulletin provides tips for preventing arm, hand and wrist injuries in an office environment.

How to control the hazard

Using a **neutral wrist posture** has little ergonomic risk because the blood flow and muscle length of your arm and hand are normal. Your wrist is in a neutral position when there is a straight line from your elbow, through the middle of your wrist to the end of your middle finger.

Improper wrist posture increases the risk of injury. The following are some common hazards involving arms, hands and wrists, and potential solutions for correcting your posture.

Hazard: **Ulnar deviation (bending the wrist away from the thumb side)**

Holding your hand and forearm muscles in this posture increases pressure in your wrist.

- Potential sources: Using a mouse, especially in tight areas restricting movement, or using a keyboard that is too small (compared to shoulder width).

- Potential solutions: Use a mouse bridge, a keyboard with a numeric pad on the left side or a keyboard without a numeric pad (if space is restricted).

(see over)

Hazard: Wrist extension (increasing the angle of the wrist joint)

Working in this posture affects the muscles and tendons above and below the wrists. Wrist extension can lead to contact stress when the wrist rests on a hard surface or edge.

- Potential sources: Using a keyboard with feet extended or a keyboard that is positioned too low, or sitting in a chair that is positioned too high.

- Potential solutions: Adjust your chair and armrests so that your elbows are bent at approximately 90 degrees. Use a wrist rest to avoid contact stress.

Hazard: Contact stress

Contact stress occurs when a hard surface presses into the body, causing a decrease in blood and nerve supply to the working muscles. This can lead to fatigue, tingling sensations and pain. Contact stresses can also occur at the elbow.

- Potential sources: Resting the wrist, forearm or elbow on a desk surface or edge.

- Potential solutions: Adjust your chair to an appropriate height. Use a gel wrist rest when using your keyboard and mouse.

Hazard: Excessive elbow flexion (decreasing the angle of the elbow joint)

Excessive elbow flexion decreases the space in the elbow (cubical tunnel) which can increase the pressure on the blood and nerves that pass through the area.

- Potential sources: Using a keyboard that is positioned too high, or a chair that is positioned too low.

- Potential solutions: Position your keyboard or chair so that your elbows are bent at approximately 90 degrees. Use a height-adjustable keyboard tray.

(see over)

Alternative Equipment Options

Split keyboard: The middle of a split keyboard is elevated compared to the edges, and the split keys are angled and wider apart, both of which promote a more neutral wrist posture.

Ergonomic mouse: A mouse that allows the hand, wrist and forearm to be in a more neutral posture, which can reduce tension in the forearm muscles.

Mouse bridge: A mouse bridge is a stable surface that covers the numeric pad on the keyboard. A bridge can be used when there is not enough room to position the mouse beside the keyboard.

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