



Office Ergonomics

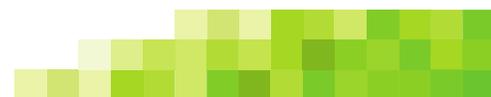
A Healthy Workstation Guide

2017

Safety Resources



UNIVERSITY OF
SASKATCHEWAN



How to Use this Document:

This document provides basic guidelines that will allow you to proactively set up and /or adjust your office equipment to reduce risk of musculoskeletal disorders (MSD).

Disclaimer:

The guidelines presented in this manual are voluntary and may not be suitable in every situation. This guide is not intended to address specific injuries, restrictions or medical conditions. In these situations, an ergonomic professional should be consulted.

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For more information visit www.safetyresources.usask.ca or call 306-966-4675.

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Office Ergonomics

Ergonomics: the study of people's efficiency in their working environment.

Ergonomics seeks to fit the job to the individual, rather than fitting the individual to the job. Proper ergonomics reduces the likelihood of developing a musculoskeletal injury.

The modern office is centred around the computer, and most tasks are sedentary and repetitive. With this, one must take care to sit properly, eliminate excessive strain, and take frequent breaks. Prolonged strain with no corrective actions can lead to musculoskeletal injuries and disorders (MSIs and MSDs).

Musculoskeletal Disorders

Components of the Musculoskeletal System

- Ligaments
- Muscles
- Nerves
- Tendons
- Joints
- Blood Vessels

Common MSDs:

- Muscle / Tendon Strain
- Tendonitis
- Ligament Sprain
- Tension Neck Syndrome
- Trigger Finger / Thumb
- Rotator Cuff Tendonitis
- Carpal Tunnel Syndrome
- Degenerative Disc Disease

Musculoskeletal Disorders form over time from exposure to risk factors, including both ergonomic factors and individual factors. MSDs can be avoided by identifying your risk factors, and proactively reducing your risk factors.

What Causes MSIs / MSDs?

Occupational Risk Factors (direct)

- Exerting **force** to perform a task or to use a tool
- Working in **awkward postures** (turning your neck / shoulders / back to work)
- Remaining in a **sustained posture** (e.g. sitting, standing) for an extended length of time
- Continuous pressure from a hard surface or edge on any part of the body, which is also known as **contact stress** (i.e. forearm is in continuous contact with desk edge while keyboarding)
- Performing **repetitive tasks** for an extended length of time

Lifestyle Risk Factors (indirect)

- **Inactivity** and poor physical health
- The **aging** process (deterioration of joint tissue)
- **Injuries** that do not heal properly (poor rehabilitation)
- Smoking and eating unhealthy food

What Prevents MSIs /MSDs?

Occupational Controls

- Employing **proper ergonomic positioning** for your work (posture and limb positioning)
- Breaking up repetitive tasks with other work duties
- Taking opportunities to **get up and move**

Lifestyle Controls

- **Regular exercise** will improve your cardiovascular health and muscle strength, thus improving your metabolism, circulation, and energy levels
- **Drinking water** moves nutrients through your body, helps flush out waste products, hydrates your body's tissues, including muscles and cartilage
- Follow the advice of your health care provider, manage any **pre-existing conditions**, and/or avoid long term health complications

In terms of musculoskeletal injuries and disorders, watch for these signs and symptoms:

- Pain
- Cold hands
- Weakness
- Tingling
- Swelling
- Numbness
- Changes in skin colour
- Decreased range of motion

If You Develop Any Symptoms:

- Speak with your health care provider about the symptoms you have identified
- Follow your health care provider's advice
- Follow the instructions in this manual

Report any sustained injuries to your supervisor immediately.

Adjusting Your Chair

The chair is your most important piece of office equipment as it must support and promote posture for your entire body. If your chair does not seem to be working properly, make arrangements to have it repaired or replaced. Visit <http://facilities.usask.ca/> and make a request.

Seat Height

The height of your seat affects how you support your legs throughout the day.

Adjust the seat height so that:

- Your feet are flat on the floor
- Your thighs are parallel to the floor

If your feet do not reach the floor, use a footrest.

Seat Pan Depth

The “seat pan” is the cushion you sit on. It should be adjusted to suit your leg length.

Adjust the seat pan depth to allow you to:

- Sit all the way back in your chair
- Have space between the front of your seat and the back of your legs

Backrest/Lumbar Support Height

Adjust the backrest height so the lumbar support contacts the natural curve of your lower back. If there is a lumbar firmness control, adjust to your comfort level.

Backrest Angle

Adjust the recline angle of the chair (100°-110° reclined angle).

If you have an active back mechanism on your chair, use it to make frequent position changes.

Adjust the tension to counterbalance your weight.

Armrests

Adjust the armrest width and height so your arms are hanging close to your sides and they are well supported, without pushing your shoulders higher than normal.

If you do not want to use the armrests, they can be removed or lowered.

Adjusting Your Keyboard and Mouse

Your keyboard and mouse are frequently used items in the office workstation. Having them in the proper configuration with help reduce symptoms of fatigue and strain.

- Place your keyboard on a keyboard tray, directly in line with you and your monitor
 - Contact FMD (966-4496) to procure a keyboard tray (at no cost)
- Place your mouse immediately beside the keyboard
 - The mouse size should be appropriate for your hand size
- Move your chair close to the keyboard tray, so you can keep your arms close to your body
 - Reaching uses neck/shoulder muscles
- Raise your tray so that your wrists and elbows are held at the same height
- Keep your wrists elevated while typing (using a palm rest)
- Do not anchor your wrists to your tray, and avoid bending your wrists to type; this puts pressure on your median nerve
- Instead, rest the cushion of your lower palm, not the wrists (nerves and tendons are relatively exposed on the wrist)



Tips for healthy typing and mousing:

- Consider using a wireless keyboard and mouse, for ease of use
- Tilting your keyboard tray away from you promotes neutral wrists
- If you prefer continuous arm support while keyboarding, adjust your chair armrests
- Keep your arms close to your sides, and your shoulders neutral
- Consider using the mouse on the alternate side occasionally to divide the workload between the two hands
- If you have hand, wrist or forearm symptoms, an ergonomically designed keyboard or mouse may be beneficial. Consult the “Ergonomic Equipment Procurement Guide” at the end of this manual.

Adjusting Your Monitor(s)

Single Monitor Workstation

Monitor Position

Place the monitor directly in front of you

Tilt the monitor to face you directly (avoid an excessive upward or downward tilt)

If you wear progressive lenses, you may need to have the monitor adjusted accordingly dependent on your prescription eyewear. This helps to avoid unnecessary tilting of the head, which can lead to neck strain and discomfort.

Monitor Height

Adjust the monitor height so the top of the screen is about level with your eyes (adjust accordingly dependent on your prescription eyewear)

You should not have to look up to clearly view any part of the screen

Monitor Distance

Your monitor should be placed roughly an arm's length away from you, when seated in a comfortable position

Visual Comfort

Adjust the brightness and contrast settings so the screen is comfortable to view

Adjust system font size to visual comfort level

Dual Monitor Workstation

Monitor Height, Distance, and Position

Multiple monitors should be at the same height, distance and tilt, and angled toward the user

If one monitor is used more heavily, position the primary monitor in front of you and the secondary monitor to the side. Angle the secondary monitor towards your body

Office Lighting

Modern offices have several potential sources of glare; overhead lighting, windows, reflected light from walls and furniture, improperly placed task lighting, and ambient lighting. Uncontrolled glare can cause eyestrain.

- If possible, orient your workstation so any windows are at 90 degrees to your monitor
- Glare from windows can be controlled by using light blocking window coverings
- Avoid having windows directly in front or behind you
- Your desk should be oriented to avoid direct glare on the monitor from overhead lights
- Changing the monitor tilt may also be helpful
- A task light can help to illuminate papers and desktop items to improve readability

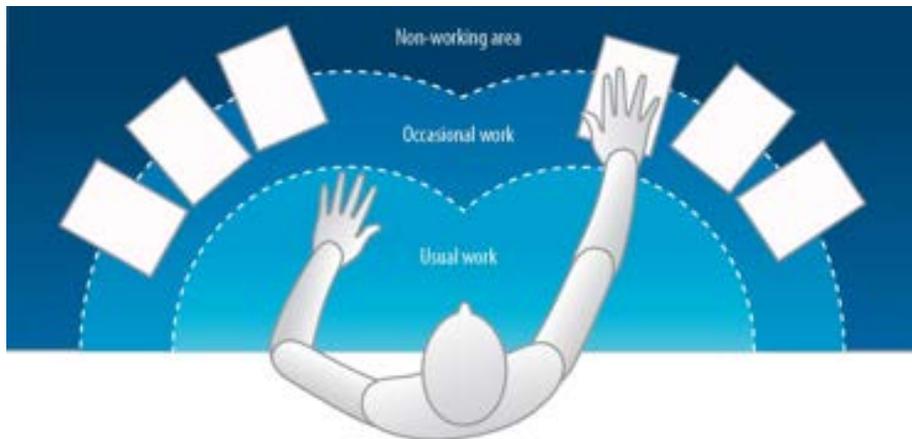


Workstations

You should be provided with a proper workstation. A proper workstation includes a desk that has room for your computer components and other necessary work items. It should also have sufficient under-desk space to freely move your legs without impediment.

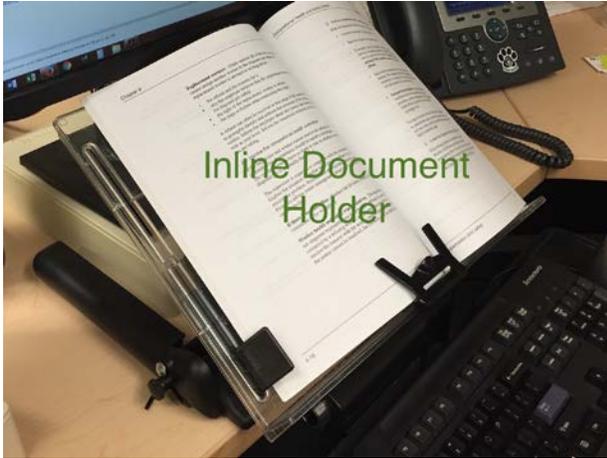
Tips for a healthy workstation:

- Place frequently used items on the desktop within easy reach
- Avoid clutter on and under your desk
- Give yourself enough room to move freely
- Do not place immobile items (e.g. printer) near your elbows or your chair
- Avoid awkward working positions, overreaching, and awkward reaching
- If you are reaching for the telephone or for a reference binder (etc.), bring it closer to you
- The CPU (computer tower) can be stored on the desktop, in an under-mount bracket, or on a wheeled cart for easy access
- Consider going wireless!
- Wireless keyboards and mice are available at the Campus Computer Store



Document Holders

If you frequently refer to documents as you type they should be placed conveniently. If they are located to the side, then it may create a risk for neck, shoulder, and back strain.



The optimum position for documents is directly in front of you.

An in-line document holder is suitable for larger or heavier items, such as binders or books.

If sturdy enough, it can also function as a convenient writing surface (a “writing slope”).

Tips for visual comfort:

Take regular breaks to rest the eyes by using the **20-20-20 Rule**:
Every 20 minutes, look at something 20 feet away for 20 seconds
Our eyes are designed to experience variability in focal distance

Blink rate is reduced when viewing the monitor and this can contribute to dry eyes.
Post a reminder to “Blink” on your monitor.

Straining to view objects on the screen can lead to eye fatigue.
Increase font size and icon size to view items more easily.

Laptop Computer Use

Laptop computers were never designed for extended use.

Smaller key size and spacing, and the proximity of the keyboard and screen make typing more difficult. This can present a risk for postural fatigue and hand strain if used for long periods of time.

If your laptop is your main computer, best practice is to use an external monitor, external full size keyboard, and an external mouse while you sit at your workstation

Ask the Campus Computer Store staff for “docking” options

If you carry your laptop to different locations frequently, consider using a backpack for ergonomic transport

Telephone Use

If your job duties involve a lot of telephone work, remember the following:

- Don't over reach for the phone
- Rather, place the phone within easy reach if you use it often
- Don't cradle the phone between your head and shoulder
- Cradling the phone between your neck and shoulder for any significant period of time is a risk for neck strain and injury
- If you are on the phone more than 30% of the workday or if you frequently use the phone and computer simultaneously, a headset phone may be beneficial
- If practical, a speakerphone is a good alternative

Work Organization

Task Rotation

Reduce fatigue by switching from computer work to other work tasks to vary your posture and rest tired muscles.

Examples:

Make a few phone calls

Pick up the mail

Organize your desk / file papers



Recovery Pauses

If you work on lengthy computer tasks from start to break, you can reduce tension in your muscles by recovery pauses.

finish without a taking regular

Pauses of twenty (20) seconds combined with office stretches will help combat muscle soreness.

Be proactive! If you begin to experience muscle soreness, you've waited too long.

Take recovery pauses more often as the intensity of your work and the time you spend typing increase.

Taking your regular allotted breaks and not working through them will also prevent fatigue.

If you incorporate regular recovery pauses into your day, you will likely feel better and still complete the same amount of work as you would without taking recovery pauses.

Reducing Mouse Use

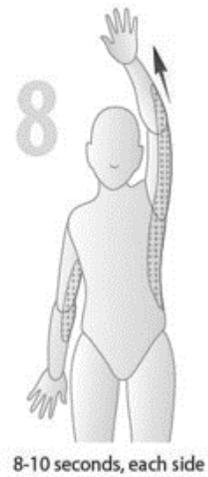
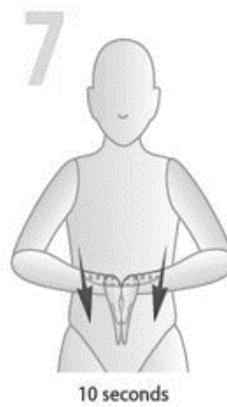
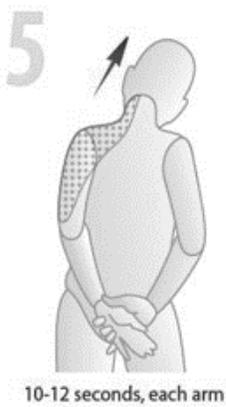
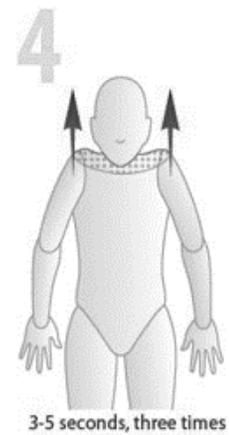
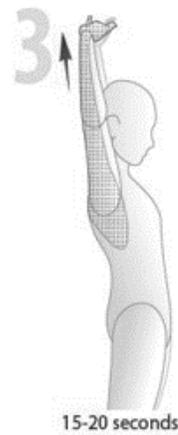
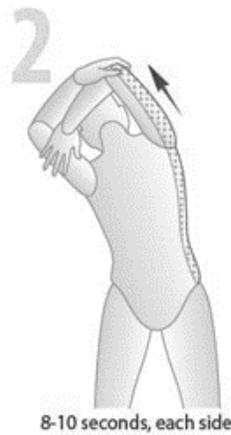
Using keyboard shortcuts can reduce the use of the mouse.

Common Microsoft (Ctrl) /Apple (⌘) shortcuts:

Ctrl / ⌘ + C:	Copy	Ctrl / ⌘ + Shift + Down:	Select All Below
Ctrl / ⌘ + X:	Cut	Ctrl / ⌘ + Shift + Right:	Select All to Right (good for Excel)
Ctrl / ⌘ + V:	Paste	ALT/⌘ + TAB:	Switch between Open Programs
Ctrl / ⌘ + B/U/I:	B old/ <u>U</u> nderline/ <i>I</i> talic	Windows Button:	Open Start Menu
Ctrl / ⌘ + A:	Select All	Ctrl / ⌘ + Z:	Undo

Office Stretches

Even with the best workstation equipment and setup, working for long periods at a computer can cause fatigue and discomfort. Doing a simple set of stretches can go a long way to alleviating fatigue and reducing muscle discomfort. The below stretches can be performed every couple of hours, or when you feel it is necessary. If you feel any discomfort or pain while performing these stretches, stop immediately. Consult with your health care provider before starting any stretching or exercise program.



Post this page in your office as a reminder to stretch regularly.

Sit-Stand Workstations

Sit-stand furniture is designed to allow a worker to easily convert their workstation from a sitting desk to a standing desk.

If interested in this option, please consider the following:

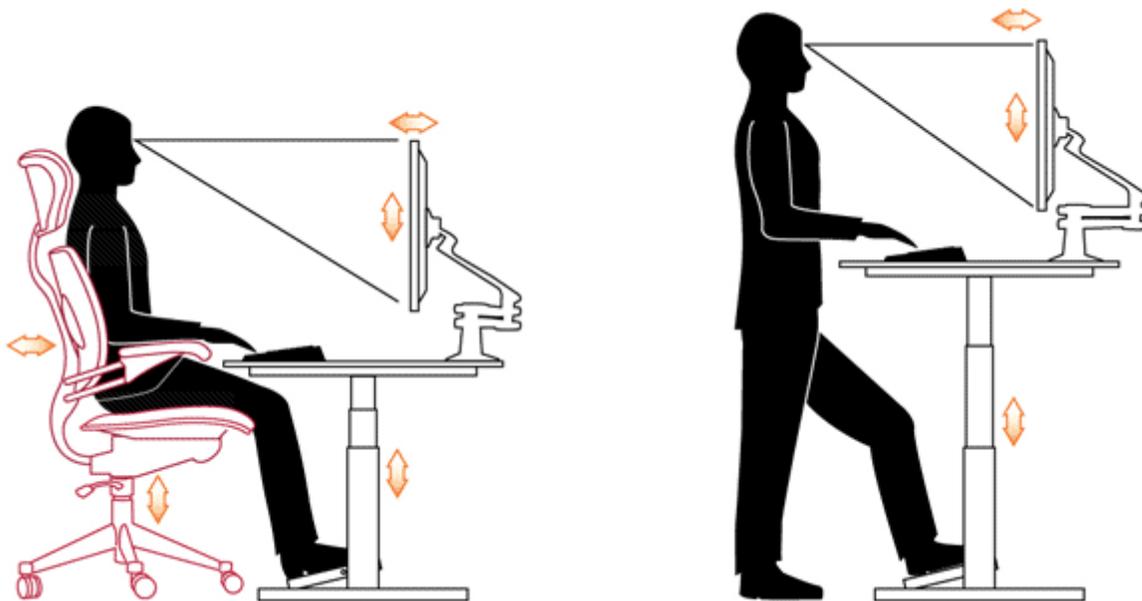
- This furniture must be **purchased by your department or yourself** (no funding available)
- This furniture must be **installed by a professional** (a tradesperson from FMD)

The following items have been approved for use at the University of Saskatchewan:

- [Varidesk](#) (sits on top of desk)
- [Ergotron](#) (attaches to the edge of a desk)
- [Steelcase](#) (height adjustable full desk)

This furniture must be compatible with your workstation. Contact FMD (4496) to discuss sit-stand furniture.

The same rules apply to standing as they do to sitting:



(Image sourced from http://www.safety.uwa.edu.au/__data/assets/image/0003/2730054/sit-stand.gif)

Tips for working at a sit-stand workstation:

- Keep your arms close to your body
- Work with straight, neutral wrists
- Keep your eye-line near the top of your monitor, and view screen downwards
- Stand for only 15 minutes out of an hour
- Standing presents its own ergonomic hazards, as your weight is now distributed over your feet and knees, and gravity is working against blood circulation in your legs
- Consider using an anti-fatigue mat and limit the amount of time you stand
- Standing is still *inactivity*; take breaks to go for small walks and get your body moving

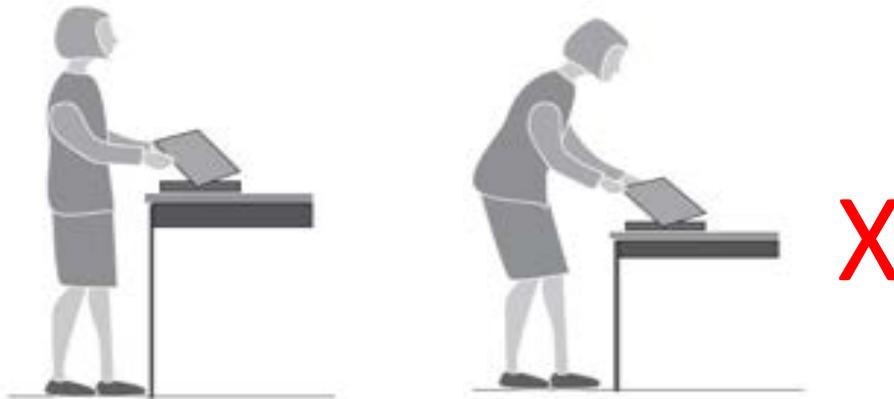
Standing Tasks

Standing tasks can be useful to break up long periods of sitting. Workstation height will depend on what kinds of tasks are being performed, but waist-height is optimal for most office tasks.

If a standing workstation involves computer use, then adjustable systems for monitor and keyboard height will help provide optimal neck and arm posture.

Tips for comfortable standing:

- Avoid prolonged leaning/stooping
- Consider risers to raise work surfaces to the correct height
- Adjustable height work surfaces will accommodate a wide variation in worker heights
 - See Ergonomic Equipment Procurement Guide (p. 15)
- If standing tasks are prolonged, an anti-fatigue mat can help to improve leg comfort



Material Handling in the Office Environment

Material handling consists of lifting, carrying, holding, pushing or pulling objects or materials from one place to another. Items may be handled with one or both hands. Of these activities, lifting usually poses the greatest risk for injury. Whether you are at work or at home, the following lifting recommendations can reduce this risk.

Lifting Recommendations

- **Assess the activity characteristics.** Is the item heavy? Do you know how heavy? Is the load bulky, unstable or awkward? Is there convenient handles? If you are not sure, test the load and get help.
- **Plan the activity.** Ensure the area is clear of obstructions for all stages of the lift, including where you will be moving the load and the path if you are carrying.
- **Warm up** before any significant material handling. A few stretches or even a short walk after extended inactivity can protect your spine while handling loads.
- Keep the load as close to your body as possible. This minimizes the forces on the spine.
- **Maintain the neutral spine posture.** Keep your head, spines, and hips in line when performing the lift. Activate your core muscles to stabilize your trunk. This will help to protect your spine.
- **Do not twist the trunk.** If you have to move the load to the side, move your feet, not your spine.
- **Adopt a wide base of support.** Keep the feet approximately shoulder width or slightly further apart.
- **Lift at a moderate speed and do not jerk the load.** Avoid using excess inertia. Obtain assistance if the load is too heavy.
- **Use mechanical aides** such as hand trucks, carts, or dollies, if available, for heavy loads. Push, rather than pull carts or trolleys.
- **Avoid carrying bulky items** that impede your view. If possible, **balance the load** by carrying something in each hand.
- **Maintain a good level of physical fitness.** The stronger and fitter you are, the less chance you have of sustaining injuries.

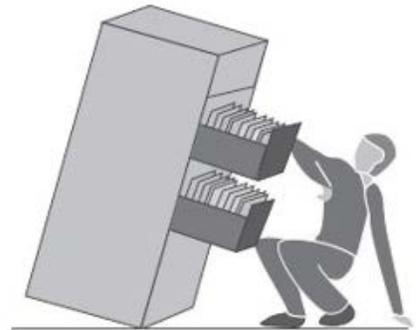
For more information on material handling, call 306-966-4675.

Filing

File cabinets are a common feature in most offices. While useful for storing large amounts of paper, filing cabinets may be a source of workplace injury.

Tips for safe filing cabinet use:

- Place file cabinets out of high traffic areas.
- File cabinets should be on a level surface to prevent drawers opening on their own.
- Placing file cabinets against walls will improve stability. Consider anchoring the cabinet.
- Keep file drawers closed when not in use.
- Use only drawer handles to open and close.
- Avoid overloading upper drawers to prevent tipping.
- Place frequently used files in middle drawers, file stands or portable filing carts for easier access.
- Alternate low filing that requires squatting or kneeling with standing to break up the task.
- Break large files down into smaller ones to make them easier to handle.
- Keep file drawers loosely filled so that files will be easier to remove and replace.
- File cabinets should be inspected and maintained periodically.



Storage of Materials

Avoid heavy overhead lifting.

- The amount of load that can be safely lifted overhead is significantly less than loads handled at waist or knee level.
- Safely use a step-stool or a step-ladder to reduce the height of the lift.
Do not use chairs as a substitute.
- The heaviest items should be stored in the waist-to-knee range; lightest materials above-shoulder range; medium weight materials at floor level or from waist-to-shoulder level.



The design of boxes and storage containers can make a difference.

Boxes and containers should:

- Be as small as possible
 - This will minimize weight when fully loaded and to allow employees to lift them close to their bodies.
- Have handles
 - The use of full-grip handles decreases the stress on the body, improves the control and safety of the lift.

Ergonomic Self-Evaluation Checklist

CHAIR	
<i>Seat Height</i>	<ul style="list-style-type: none"> • Knees level with, or slightly lower than hips when sitting • If feet do not reach the floor, support should be provided with footrest
<i>Seat Depth</i>	<ul style="list-style-type: none"> • Approximately 3 finger widths between the back of knees and the seat edge
<i>Lumbar</i>	<ul style="list-style-type: none"> • Lumbar support contacts the curve of lower back, and firmness adjusted to comfort level
<i>Backrest Angle</i>	<ul style="list-style-type: none"> • Slightly reclined posture provides weight distribution across the chair; Keep head positioned over shoulders (not forward or backward)
<i>Armrests position</i>	<ul style="list-style-type: none"> • Keep armrests close to body, and at a height that encourages neutral shoulders (not pushed up or reaching down) • If armrests are not used, they can be lowered or removed
<i>Castor Type</i>	<ul style="list-style-type: none"> • Wide castors for carpeted flooring; narrow castors for hard surfaced flooring; At least five castors for proper chair stability
KEYBOARD & MOUSE	
<i>Keyboard height</i>	<ul style="list-style-type: none"> • Height of keyboard should encourage keeping upper arms close to one's body, and lower arms in line with wrists (no reaching; no significant bend at the wrist) • Chair height must be adjusted appropriately if keyboard used on desktop
<i>Keyboard angle</i>	<ul style="list-style-type: none"> • Flat or tilted slightly away • Wrists straight when typing
<i>Keyboard size/shape</i>	<ul style="list-style-type: none"> • Wrists straight and not bent to either side
<i>Mouse height</i>	<ul style="list-style-type: none"> • Height of mouse should encourage keeping upper arm close to body, and lower arm in line with the wrist (no reaching; no significant bend at the wrist) • Used on same surface as keyboard
<i>Mouse size/shape</i>	<ul style="list-style-type: none"> • Hand rests comfortably on mouse. Mouse not too big or too small • Wrist straight
MONITOR(S)	
<i>Monitor height</i>	<ul style="list-style-type: none"> • Top of screen level with eyes (slightly lower if progressives are worn). Additional monitors at same height.
<i>Monitor distance</i>	<ul style="list-style-type: none"> • Roughly an arm's length from a comfortable seated position; adjust font size to suit vision
<i>Monitor position</i>	<ul style="list-style-type: none"> • Primary monitor positioned directly in front of person • Secondary monitor positioned to the side • Multiple monitors that are used equally should be centered directly in front of person
<i>Visual comfort</i>	<ul style="list-style-type: none"> • Settings (e.g. brightness and contrast) set at comfortable level
WORKSTATION	
<i>Workstation height</i>	<ul style="list-style-type: none"> • Promotes proper working posture and comfort while executing tasks (computer and paper tasks)
<i>Workstation type</i>	<ul style="list-style-type: none"> • Suitable size and type for tasks (accommodates equipment and reference material, shape allows for free movement) • Configuration allows for optimal workflow (e.g. straight vs. L-shape vs. U-shape vs. sit-stand)
<i>Leg clearance</i>	<ul style="list-style-type: none"> • Under desk is free of clutter, legs able to move freely • Keyboard tray does not contact legs
<i>Surface organization</i>	<ul style="list-style-type: none"> • Frequently used items are easily accessible and within reach
<i>Footrest</i>	<ul style="list-style-type: none"> • If feet do not reach the floor, support provided with footrest
ENVIRONMENT	
<i>Lighting/Glare</i>	<ul style="list-style-type: none"> • Lighting is adequate for tasks being performed • Monitor is free from glare from windows, overhead lights, reflected light • Light levels are comfortable, no need for squinting or leaning forward
<i>Noise</i>	<ul style="list-style-type: none"> • Noise levels appropriate for work environment
<i>Temperature</i>	<ul style="list-style-type: none"> • Temperature appropriate for work environment
WORK ORGANIZATION	
<i>Document use</i>	<ul style="list-style-type: none"> • Documents placed directly in front of person when referred to frequently; document placement allows for appropriate posture
<i>Phone/headset use</i>	<ul style="list-style-type: none"> • Headset or speaker phone used to minimize neck cradling and enables proper posture during phone use
<i>Alternate tasks</i>	<ul style="list-style-type: none"> • Alternate tasks available to reduce fatigue and vary posture
<i>Recovery pauses</i>	<ul style="list-style-type: none"> • Opportunity to get up and move regularly, at least once per hour
<i>Material handling</i>	<ul style="list-style-type: none"> • Proper material handling practices are followed • Mechanical aides or assistance from another person is used for heavy or awkward loads

Ergonomic Equipment Procurement Guide

Use the listed examples as a guide to purchasing ergonomic equipment and furniture. New equipment may take weeks to get used to, but may promote the best habits at the workstation.

Table 1. Ergonomic Equipment

Keyboard Palm Rest	Mouse Palm Rest
Wireless Mouse	Ergonomic Keyboard
Compact Keyboard	Wireless Keyboard and Mouse
Numeric Keypad	Monitor Arm
Monitor Riser	Anti-Fatigue Mat
Task Lighting	Back Support
Foot Rest	Inline Document Holder

Table 2. Ergonomic Furniture

Sit-Stand Workstation (Desktop)	Sit-Stand Workstation (Full Desk)
Sit-Stand Workstation (Minimal – Dual Monitor)	Sit-Stand Workstation (Minimal – Single Monitor)

In accordance with the [University of Saskatchewan Furniture Policy](#), furniture shall be procured through the Facilities Management Division (FMD). FMD also installs keyboard trays.

Furniture purchases are the responsibility of your department.