



Winnipeg Regional
Health Authority

Office régional de la
santé de Winnipeg

Computer Workstation Ergonomics

Sylvia Horvath, B.M.R. (P.T.), B.A.

Musculoskeletal Injury Prevention Specialist

WRHA Occupational and Environmental Safety and Health

Objectives

- Recognize signs & symptoms of Musculoskeletal Injuries
- Recognize ergonomic hazards/risks during computer work
- Discuss control measures to eliminate or reduce risk

Musculoskeletal Injury (MSI)

- Soft tissue damage or aggravation in the musculoskeletal system caused when demands exceed the physical tolerance of connective or related soft tissues such as muscles, tendons, ligaments, nerves, discs and joints. Damage can result from a single event or develop over time.
 - Discomfort or pain from sprains & strains

[Manitoba's Musculoskeletal Injury Prevention Strategy \(safemanitoba.com\)](http://safemanitoba.com)

MSI Signs & Symptoms (S&S)

- ***Pain/Discomfort**
- Numbness/ Tingling
- Burning
- Swelling/Redness
- Decreased range of motion
- Weakness/Fatigue

Stages of MSI

Early Stage

S&S during task/work but disappear at rest or when task is stopped



Middle Stage

S&S continue after task/work completed. More signs and symptoms that may not disappear with rest. Work is somewhat affected



Later Stage

S&S present at most times/rest. Work and sleep are disrupted.

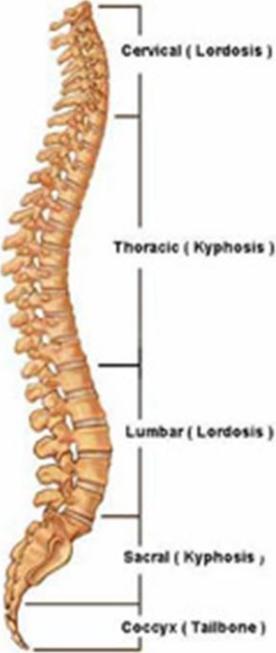
Ergonomic Risk Factors

- Awkward or Sustained Postures
- Repetitive Motions
- Contact Stress
- Forceful Exertion



Awkward Postures

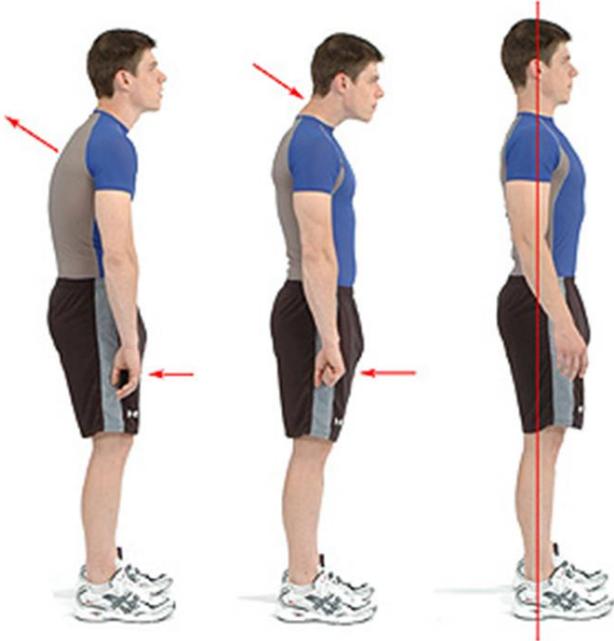
Lateral (Side) Spinal Column



NEUTRAL



NEUTRAL

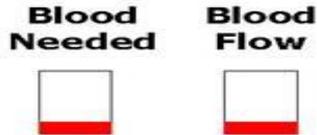


AWKWARD

Sustained Postures



Resting



Dynamic Effort



Static Effort



Adapted from E. Grandjean's, "Fitting the Task to the Man"

Repetition

- Same motion with same body parts with little chance of recovery time (high frequency)
- Accumulation of small amounts of tissue damage
- Coupled with static/awkward postures or forceful exertions is critical factor



Contact Stress

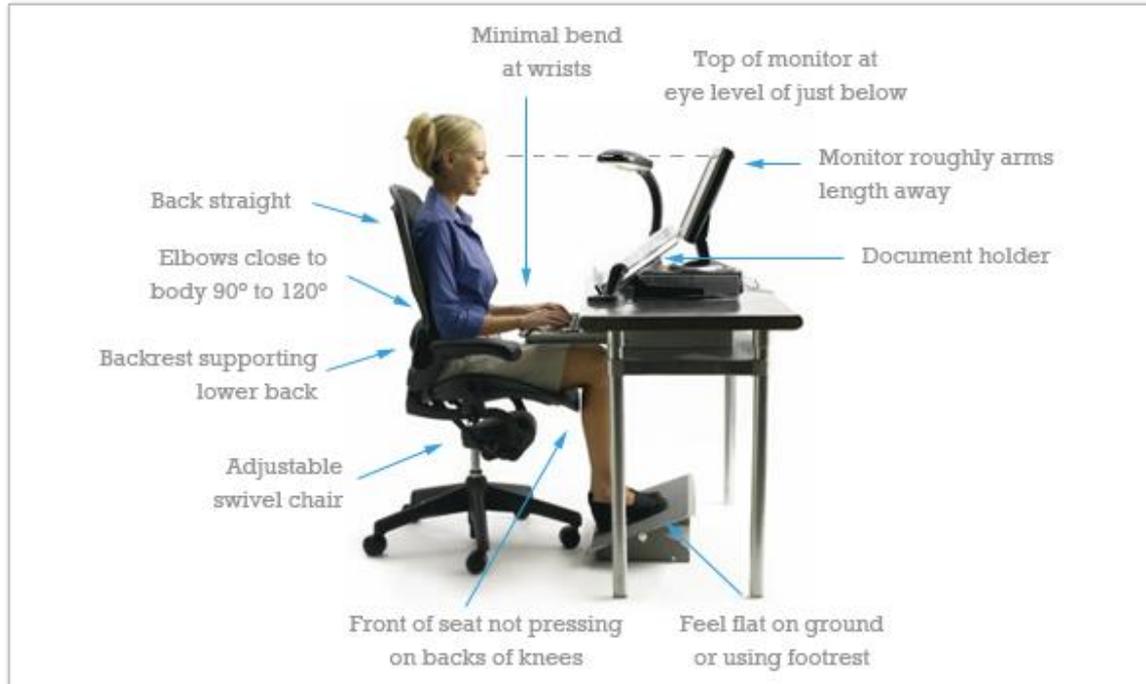
- Hard or sharp object comes in contact with skin/body
- Force is concentrated on a small area of the body, pinching or crushing tissue and causing discomfort and often pain.



Risk Factors - Laptops



Reducing MSI Risks



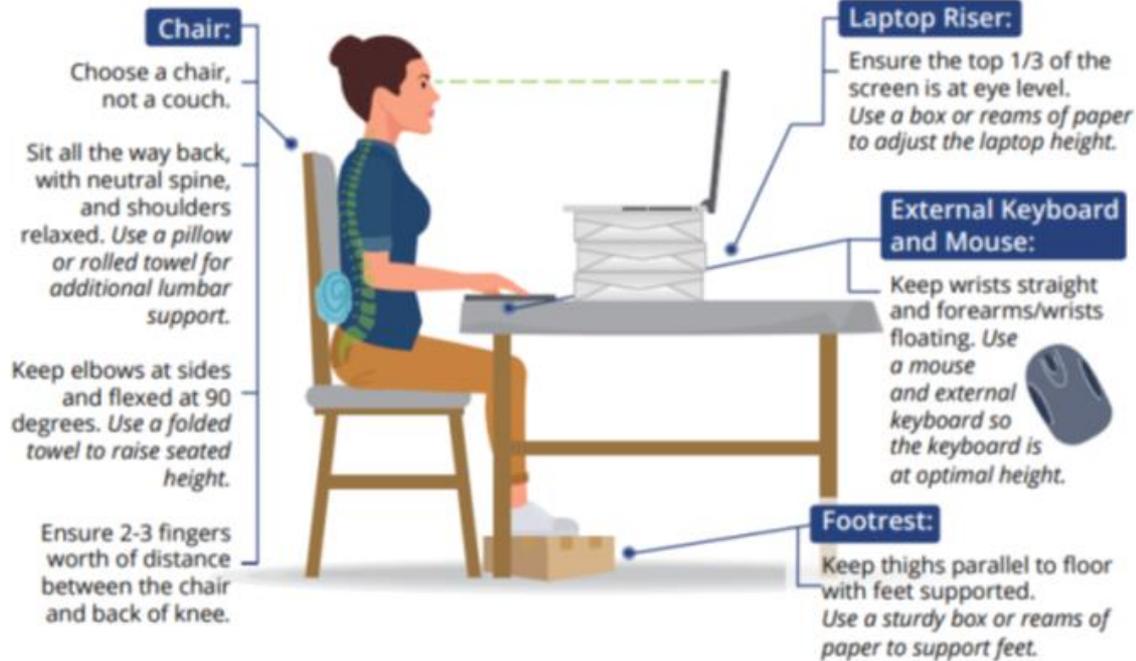
Adjusting Your Chair



- Back Rest Height - lumbar support is at approximately waist line
- Back Rest Angle – upright or slight recline
- Seat Depth - 2-3 finger spaces between the back of knees and front edge of seat
- Arm Rest Height - slightly lower than your elbow
- Chair height - armrests are in line with the height of the keyboard. If your feet are not flat on the ground, use a foot rest.



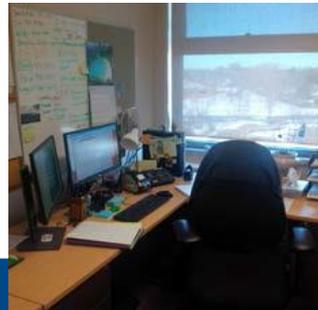
Reducing MSI Risks



Monitor

General Guidelines

- Top of screen at eye level
 - bifocals/progressives: lower screen until you no longer tilt your neck back
- Monitor distance about arm's length away
- Single monitor: centered in front
 - Dual monitors: center body between two monitors if used equally or center monitor use most frequently
- Positioned 90° to windows – reduce glare
 - Tilt monitor angle
- "20/20/20" rule to reduce eye fatigue



Laptops



Use external monitor, keyboard & mouse

- Laptop can be used as second screen



No external monitor?

- Elevate laptop (laptop stands, books, etc.)



No external equipment/desk?

- Tilt monitor
- Cushion on lap
- Neck exercises/breaks

Most effective

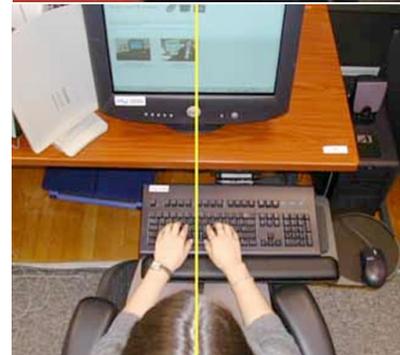


Least effective

Keyboard

General Guidelines

- Elbows bent at approximately 90°
- Armrests supporting forearms or gel wrist rest at palms
- Lower keyboard feet
- Centre alpha numeric keyboard with body ("B" key in line with belly button)



Mouse

General Guidelines

- Position on the same surface/level and close to keyboard
- Close enough to reach with elbows close
- Rest palm and fingers lightly on mouse, relax the wrist and hand and use the shoulder. Avoid moving wrist side to side.
- Use keyboard shortcuts



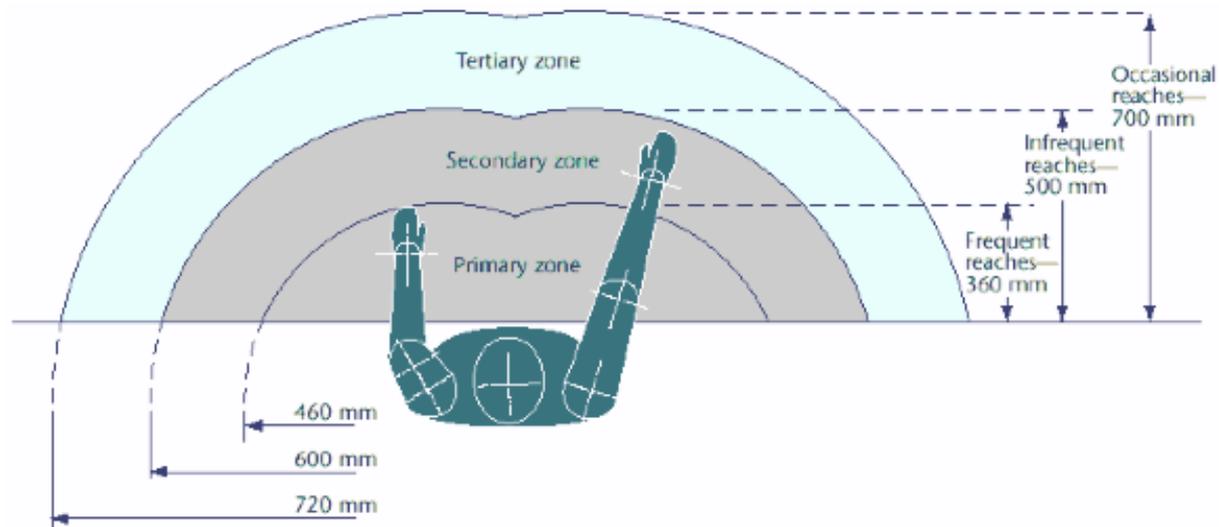
Document Holders

General Guidelines

- Raise and angle reference documents (e.g., data entry)
- Position to side of computer or in line between keyboard and monitor



Reduce Reaching



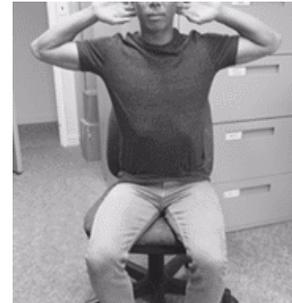
Z412-00 Guideline on Office Ergonomics

Reversing The Stress

- Movement Breaks!
 - 10-20 secs/5-10 mins: change position, rest hands
 - 2-5 mins/30 mins or 5-10 mins every hour
 - Perform specific exercises or work tasks that require standing/movement
- Standing/walk during meetings, talking on phone

Reversing The Stress

- Stretch regularly during the day
 - Hold minimum 15 seconds/3 reps
 - Mild tension (no pain)
 - Avoid sudden movements
- 150 min of moderate to vigorous physical activity / week (Canadian Society of Exercise Physiology)
 - Substitute exercise for what was commute time?



Psychosocial Risk Factors

- Protection of physical safety (CSA standard Z1003-13)
 - Physical Risk assessments
- Social support (manager, colleagues)
- Safety culture/climate, workstyle
- Mental workload
- Effort reward imbalance
- Work pace job demands
- Job satisfaction

Additional Strategies

- Specific work area/location
- Regular work schedule
- Morning start up and evening shut down routines
 - Wear different clothing
- Communicate often – phone/Teams

Resources

- [Department / Unit \(sharedhealthmb.ca\)](https://sharedhealthmb.ca)
- OESH Computer Workstation Bulletins
 - <https://professionals.wrha.mb.ca/old/professionals/safety/files/MSIP/WorkstationBulletinPackage.pdf>
- Office Exercises and Stretches
 - <https://professionals.wrha.mb.ca/old/professionals/safety/files/MSIP/OfficeExercises.pdf>
- [Office Ergonomics \(iwh.on.ca\)](https://iwh.on.ca)
- Sit Stand Workstations and Work Practice Changes
 - https://professionals.wrha.mb.ca/old/professionals/safety/files/MSIP/Sit_StandWorkstations_WorkPracticeChangesFINAL.pdf
- Sit Stand Workstations – Guidelines on Use
 - https://professionals.wrha.mb.ca/old/professionals/safety/files/MSIP/SitStandWorkstation_GuidelinesOnUseFINAL.pdf

Ergonomic assessment requests can be made via email to
wrhaOESHergo wrhaOESHergo@wrha.mb.ca

Questions



Sylvia Horvath
Musculoskeletal Injury
Prevention Specialist

Phone: 204-451-5946

Email: shorvath2@wrha.mb.ca