

# Computer Workstation Ergonomics

Presented By:

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## Presentation Overview

- ❖ Introduction to Ergonomics
- ❖ Identifying office risk factors
- ❖ Proper workstation set-up
- ❖ Discuss the individual components of an "office" workstation
- ❖ Questions

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## OHCOW SERVICES

### Multidisciplinary Team

Physicians  
Nurses  
Hygienists  
Ergonomists  
Administration



### Services

Inquiries  
Individual Workers  
Group Evaluations  
Education  
Research

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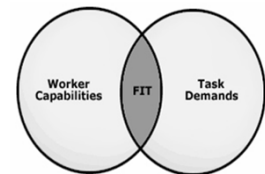
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## "Office" Ergonomics

Matching job design, equipment, and workstations to workers

Term "office" includes any computer workstation:

- Individual office
- Shared workstations
- Sit / Stand workstations
- Home set-up



"Working smarter *not* harder"

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## Musculoskeletal Disorders

↑ technology has ↑ workplace computer use

Also been an ↑ workplace claims

- In Ontario MSDs account for:
  - #1 type of claim reported to WSIB
  - 43% of all work-related injuries
  - 46% of all lost-time days
  - \$1 billion in direct and indirect costs related to MSDs (Ontario employers 2003-2007)

Recently ↑ computer/laptop/tablet use at home

- question of adequate rest?

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## Ergonomic Risk Factors in the Office



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## TODAY'S GOAL


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- ❖ "Look beyond your computer"
  - Consider your entire workstation:
    - Working postures
    - All input devices
    - Desk organization
    - Additional Equipment



- ❖ "Set up your workstation to fit you"
  - Monthly / daily / hourly adjustments


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## Ergonomics within the Office

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- ❖ **HOW?**
  - **ENSURE** equipment fit
  - **ADJUSTABLE** workstations
  - **AWARE** of posture / bad habits





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## Office Guidelines

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- Canadian Standards Association
  - Guideline on Office Ergonomics
  - CSA-Z412
- Office Ergonomic Handbook
  - Produced by OHCOW
  - Included on your DVD
  - Free download @ [www.ohcow.on.ca/workbooks](http://www.ohcow.on.ca/workbooks)





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## The COMPLETE Workstation

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Chair




Desk




Input Devices



Monitor(s)




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## Chair

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- ❖ Adjustability is KEY
  - The more features the better
- ❖ Size Appropriate
  - S / M / L
  - Refers to depth of seat pan & height of backrest
- ❖ 5 casters Base
  - Should be standard

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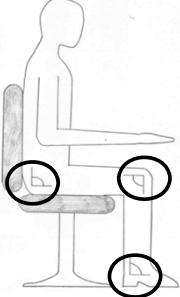
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## Angles to Consider

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*When setting up your chair*

- 1) Hips
- 2) Knees
- 3) Ankles



All angles @ 90°

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### Adjusting SEAT PAN Height

Front of knees slightly **above** seat pan

Too high may restrict circulation

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### Seating for Counter Heights

Height adjustable ring (lock in place)

\* Only 2 casters for transport \*

As a Task Chair at Counter Height

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### Seat Pan

- ❖ Rounded edge
  - Reduce contact stress
- ❖ Appropriate size
  - S-M-L
- ❖ Appropriate depth
  - "fist" test
  - Is this possible when sitting with your feet on the casters?

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### Backrests

- ❖ Need for Lumbar Support
  - Sitting flattens lumbar curve

S-curve (standing) C-curve (sitting unsupported)

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### Need for Lumbar Support

Supports the upper body, easing neck tension and offering relief for the vertebral disks.

Supports each vertebral disk in the lumbar region, providing relief for the spinal column and relaxation of back muscles.

Supports the pelvis and provides balance for the spinal column.

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### Seating for Counter Heights

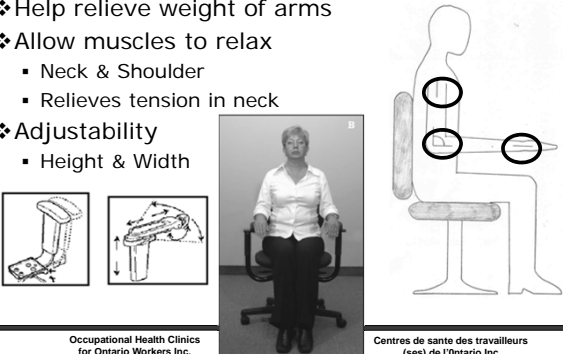
As a Sit Stand As a Sit Stand with a Backrest As a Task Chair at Counter Height

"3 in 1 Sit Stand" by ErgoCenric

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## Armrests

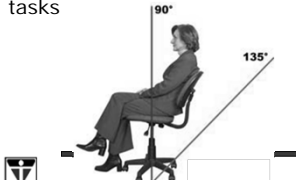
- ❖ Help relieve weight of arms
- ❖ Allow muscles to relax
  - Neck & Shoulder
  - Relieves tension in neck
- ❖ Adjustability
  - Height & Width



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## Importance of DYNAMIC Sitting

- ❖ Daily adjustments:
  - Chair type (sit / stand)
  - Chair height or even type
    - Adjusted to match different footwear
  - Recline
    - "quick release lever"
    - Adjusted as a form of postural relief during non-keying/mousing tasks
- ❖ *Alter your posture throughout the day*



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## DESK



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## Counters

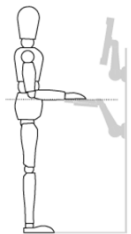
- ❖ Not the ideal place for a computer workstation
  - Lack of adjustability tends to be the biggest barrier to neutral working postures



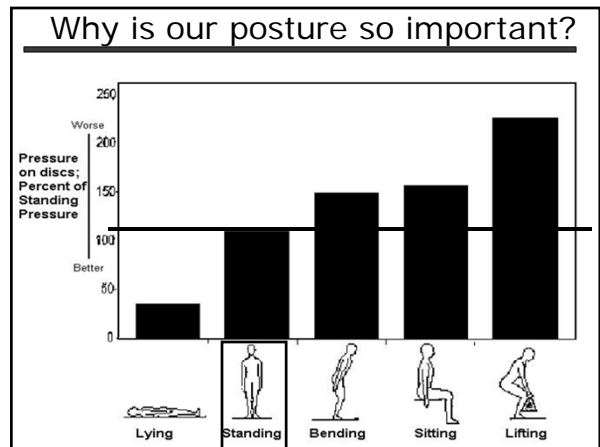
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## Counters

- ❖ Providing adjustable devices is KEY
  - Monitor arm & keyboard/mouse tray
- ❖ Should consider standing
  - Intervertebral disc pressure is lower than sitting
  - However standing use approx. 20% more energy so we get tired quickly

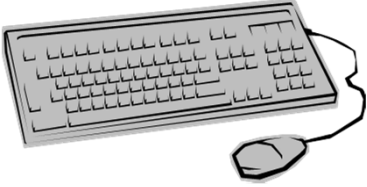


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## INPUT DEVICES

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## Keyboard

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- ❖ Elbow joint @ 90° with a relaxed shoulder
- ❖ Elbows close to body




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## Mouse Location

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- ❖ Same level as keyboard
- ❖ Use armrests
- ❖ Move elbow not wrist






C

X



D

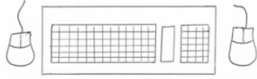
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## Mouse Location Cont.

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- ❖ Mouse should be located directly in-line w/ the mousing shoulder



- ❖ Alternative input devices do exist

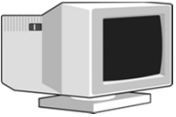




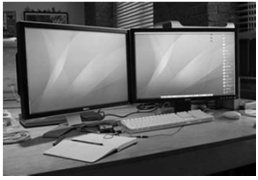

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## MONITOR or MONITORS

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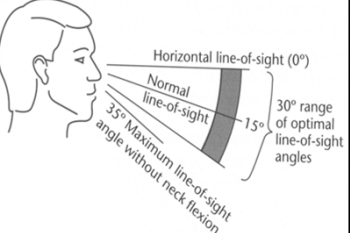
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## Your Monitor

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- ❖ **Distance**
  - In line with shoulders
  - 15" monitor = arms length (baseline)
  - "further is better" (if vision is not a problem)
- ❖ **Height**
  - Top of screen at seated eye level



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## Monitor Cont.



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## Bifocal Accommodation



- ❖ Lower the monitor
  - below previous recommendations
- ❖ Tilt the monitor screen upwards
  - as if you were reading an open book
- ❖ Raise chair until you can view the monitor without tilting your head backwards
  - keyboard & mouse need to be raised as well
  - might need a foot rest now
- ❖ Computer glasses – specifically “computer bifocals”
  - Fixed focal length (top portion)
  - Closer reading/viewing (bottom portion)

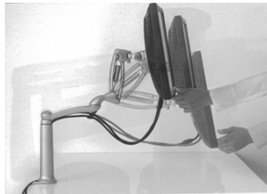
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## Monitor Adjustability

- ❖ Easily achieved by having a monitor arm
  - Can mount directly to the desk surface
  - Easy to move
  - Ability to share screen with customers (if needed)



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## Dual Monitors

- ❖ Same guidelines as for single monitor use, plus:
  - Place monitors at the same height & distance
  - Use eye movements as much as possible for viewing
  - Try to use monitors of the same size & resolution
- ❖ If both are used equally:
  - set monitors next to each with the keyboard centered



## Dual Monitors Cont.

- ❖ If one monitor is used MORE than the other
  - Place the “primary” monitor and the keyboard directly in-line
  - Place the “secondary” monitor off to the side, at about a 30 degree angle to the primary monitor
  - If documents are used for input, place holder in-line with “primary” monitor & keyboard



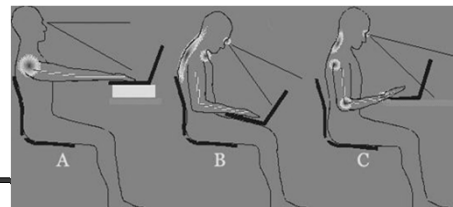
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The secondary monitor to the right is used  
to display documents needed intermittently.

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## LAPTOP USE

- ❖ Designed for SHORT TERM use
- ❖ Considerations:
  - Height of screen
  - Distance of screen
  - Size of keyboard
  - Location of keyboard



## LAPTOP USE

- ❖ **Recommendations:**
- ❖ Create a “docking station”
- ❖ Use the laptop for its screen

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## Additional Considerations


- ❖ Source Documents
- ❖ Work Organization
- ❖ Micro-breaks
- ❖ Stretching

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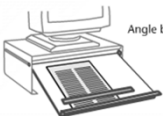
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## Document Holders


- ❖ **Reduce** neck deviations
- ❖ **Minimize** visual fatigue
- ❖ Can hold books/files/etc.



Stand-alone



Angle board




Attached to monitor

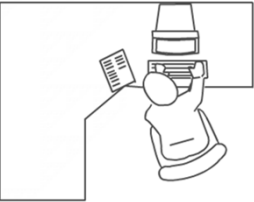
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## Work Organization



Shoulder reaching due to  
height of files



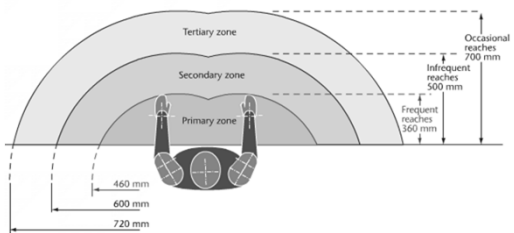
Neck bent and twisted  
to view document

Where we place things affects our posture

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## Work Organization Cont.




1. Assign percentage of use to all items on your desk
2. Place high use items within your “**natural envelope**”
3. Organize to remove bending, twisting and reaching


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## Taking Breaks



- ❖ Take frequent *Micro Breaks*  
- 15-30 sec for the eyes





- ❖ Postural Relief & Muscle recovery  
- Adjust chair throughout the day  
- Office stretching  
- Min: 1 minute every hour



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## Importance of Stretching


- ❖ Form of *ACTIVE REST*
- ❖ Increases blood circulation
- ❖ Decrease fatigue
- ❖ Improves posture
- ❖ Reduces muscular tension
- ❖ Performed throughout the day

\* Sample office stretched provided in OHCOW's Office Ergo Handbook \*

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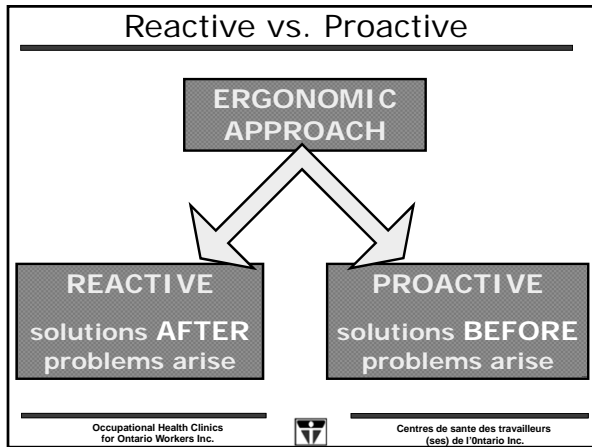
## Take Home Message

- ❖ **DO NOT IGNORE** early warning signs
- ❖ Ensure workstation **ADJUSTABILITY**
- ❖ Learn how to make things **FIT YOU**
- ❖ **CHANGE POSTURE** frequently
- ❖ **EDUCATE** yourself & your colleagues
- ❖ Become **PROACTIVE**

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## ADDITIONAL RESOURCES

**OHCOW website & fact sheets:**

[www.ohcow.on.ca](http://www.ohcow.on.ca)  
[www.ohcow.on.ca/resources](http://www.ohcow.on.ca/resources)


**Ergonomic Products & Seating:**

[www.ergonow.com](http://www.ergonow.com)  
[www.ergocentric.com](http://www.ergocentric.com)

**Ergonomic Library Carts**

[www.lyngsoesystems.com](http://www.lyngsoesystems.com)

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