Computer Workstation Assessment Training

Prevention Department
Saskatchewan Workers' Compensation Board
OH&S Division
Labour Relations and Workplace Safety

WorkSafe™
SASKATCHEWAN
Work to live.

Computer Workstation Assessment Training

Intended Audience: Supervisors or their designates
6 participants

Time Frame: Six hours

- One hour slide presentation
- Two hours interactive demonstration/practice
- One hour written exam – open book
- Two hour practical exam – computer workstation assessment

Materials: Resource Manual
Assessment Forms

- Chair Report Card
- Chair Suitability Report
- Computer Workstation Report Card
- Computer Workstation Posture Assessment

Recommended: Tool Kit

- Goniometer (beveled protractor)
- Level
- Tape measure
- Pen
- Clipboard

Objectives:

"If I sit too close, I get tangled in my screen saver."

Participants will be able:

- to apply ergonomic principles to set-up a computer workstation
- to assess a computer workstation for ergonomic fit

Why should an employer care about ergonomic fit?

- Protect the health and safety of workers
- Section 81: Musculoskeletal Injuries, Occupational Health and Safety Regulations
  - Employer must:
    - Identify work activities that could cause or aggravate MSIs
    - If risk of injury is identified, must inform workers of the risk and of the signs and symptoms of the potential injury
    - Must provide effective protection to each worker who may be at risk
    - Must provide instructions on safe work performance, use of equipment and proper work practices
    - Where a worker has symptoms of injury, must:
      - Advise worker to consult a physician or other recognized health care professional
      - Promptly review the activities of that worker and other workers doing similar tasks to identify any cause of the symptoms
      - Take corrective measures to avoid further injuries

*Occupational Health and Safety Regulations – Section 81: Musculoskeletal Injuries

What is Ergonomics?

The science of making the workplace:

- Safer
- More comfortable
- More productive

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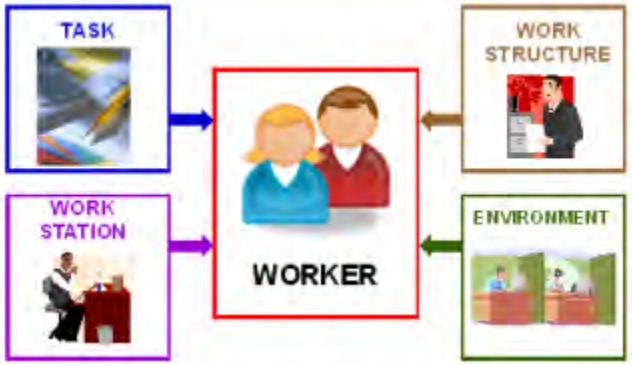
www.glasbergen.com

"We could try a larger monitor with an ergonomic glare filter...but you're still going to get headaches if you keep banging your head against the screen."

Computer Workstation

- Equipment/resources
- Design/layout
- Standard components:
  - adjustable chair
  - work surface
  - desktop computing equipment
    - keyboard
    - mouse
    - CPU
    - monitor
- Additional components:
  - footrest
  - document holder
  - telephone
  - related furniture and equipment



Tissue Tolerance

- The amount of force a body tissue can bear before it fails and injury occurs

Workloads

- Forces that act on the body during work

Safety Margin

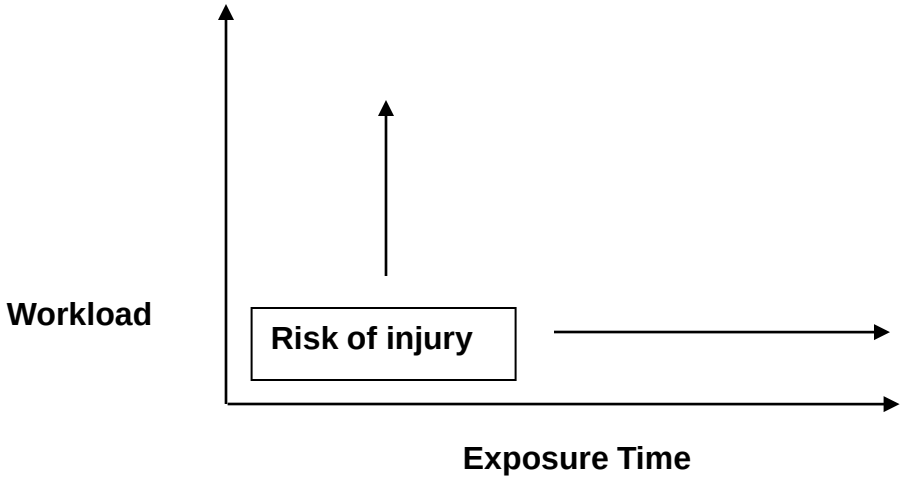
- The difference between the workload and the tissue tolerance

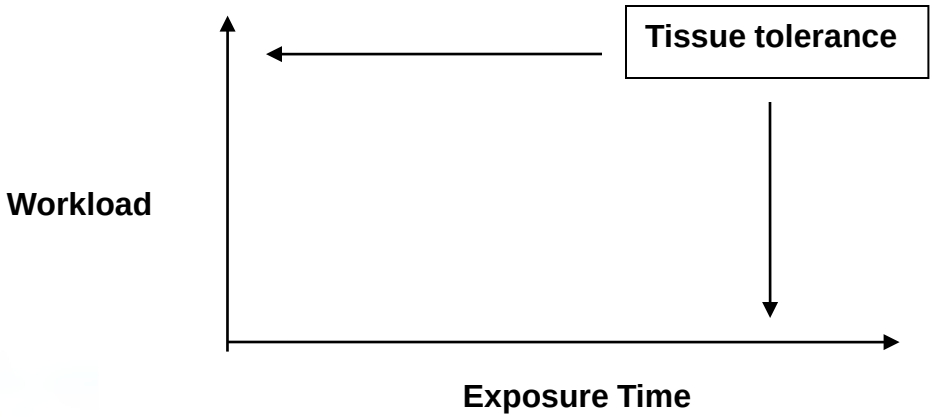
Acute Injury

- Application of force during the task is so large that it exceeds the tissue tolerance

Cumulative Injury

- Over time the application of lesser repetitive and/or sustained force lowers the tissue tolerance to the point where it is exceeded


Workload
Risk of injury
Exposure Time


Tissue tolerance
Workload
Exposure Time

Posture Force Relationship

- The amount of force required to manipulate a load depends on
  - the weight of the load
  - the position of the load in relation to the joint(s) affected
- When a muscle is close to its resting length, it has the greatest potential to generate force
- The further a muscle is from its resting length, the less force production potential and the harder the worker must work to manage the load

Dynamic Postures – involve movement

- Affected muscles are continuously tensed and relaxed

Static Postures - body part(s) are held in a fixed position for a sustained period of time

- Affected muscles are under continuous load

The body and its joints are made for movement. Regularly changing positions keeps blood flowing, muscles well fed, and waste products removed. Different muscles share in the workload and tired muscles are given the opportunity to rest.

Keeping it Neutral

The computer workstation should be set up to allow the worker to maintain neutral working postures when:

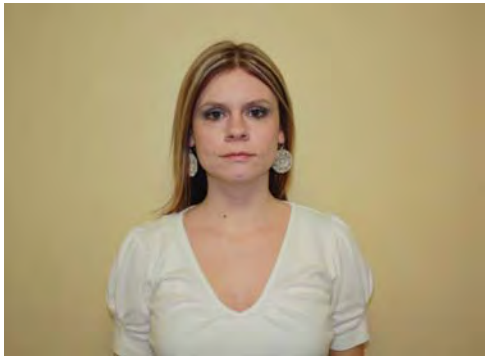
- keyboarding/mousing
- viewing monitor screen
- viewing source documents
- reading/writing

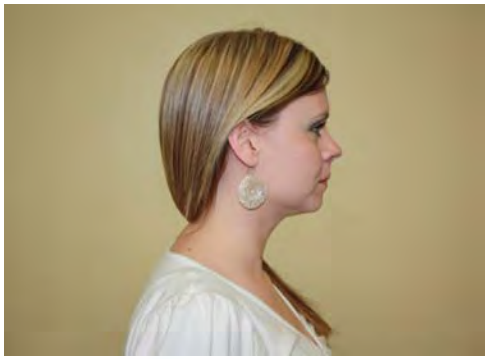
Neutral Posture – posture with the greatest potential to generate force

Awkward Posture - away from midline or neutral posture

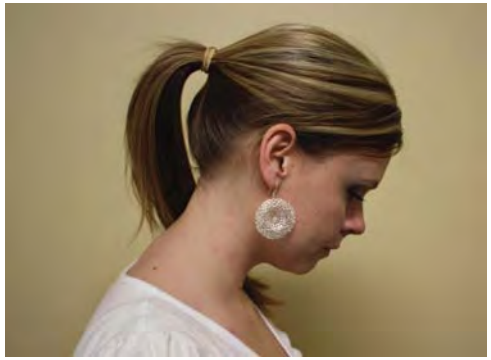
Neck

Neutral



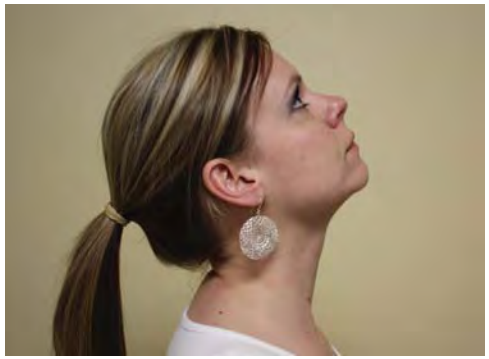


Rotation



Flexion

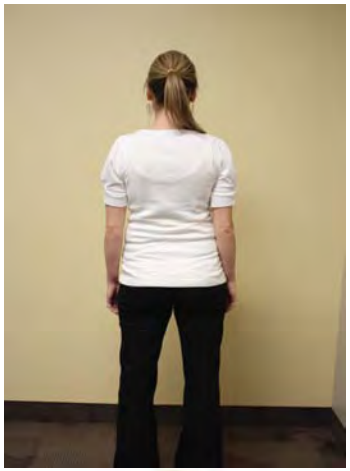
Lateral Bend



Extension

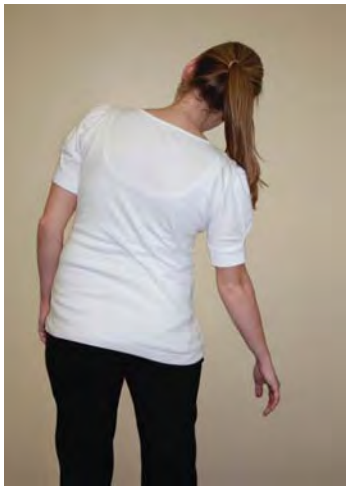
Back

Neutral

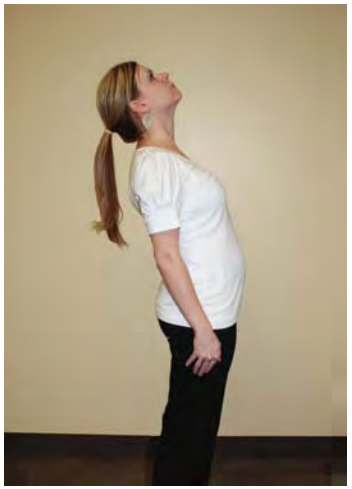


Rotation

Lateral Bend

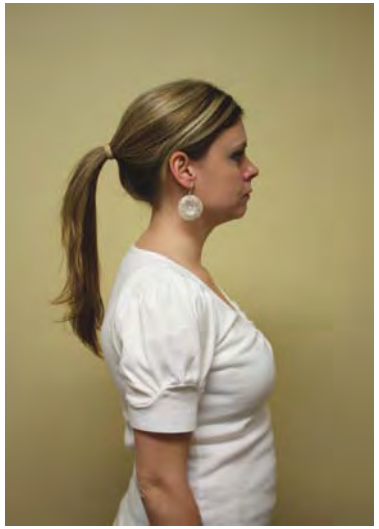


Flexion



Extension

Shoulder



Neutral

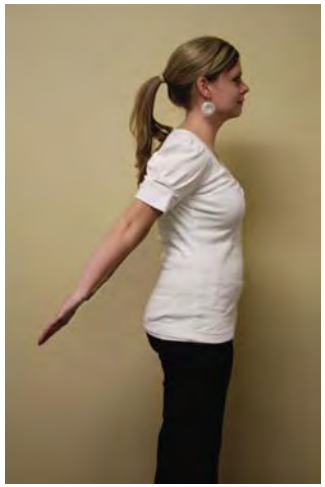
Raised

Abduction –
lateral – dropped

Adduction

Abduction –
away from midline

Extension

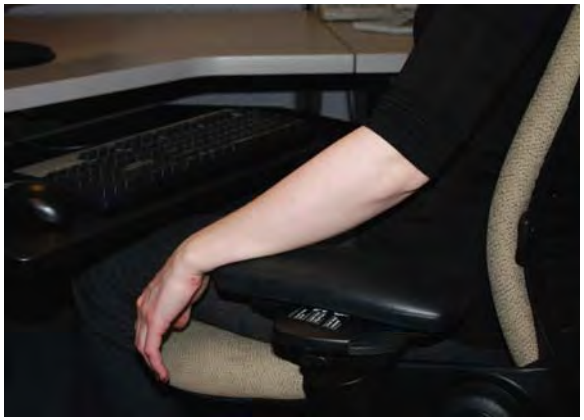


Flexion

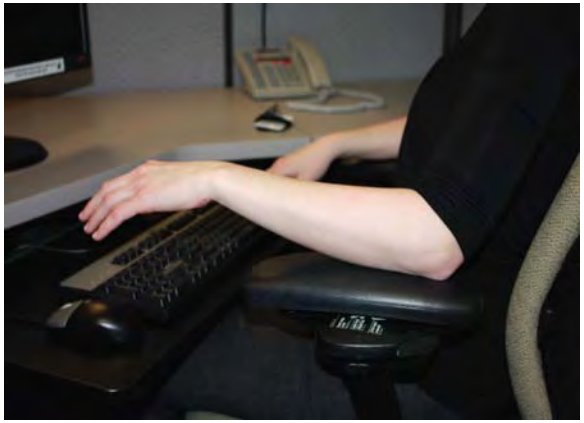
Elbow

Neutral

Obtuse Flexion

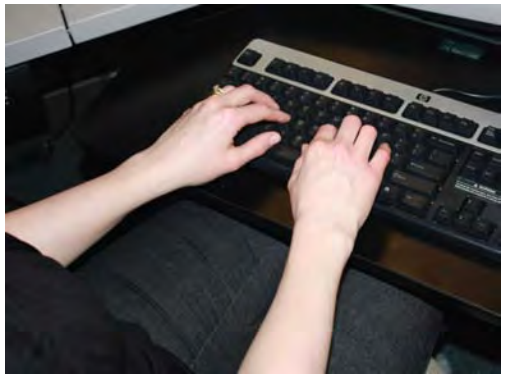


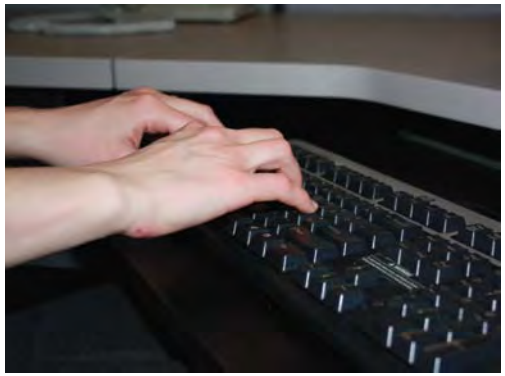
Acute Flexion



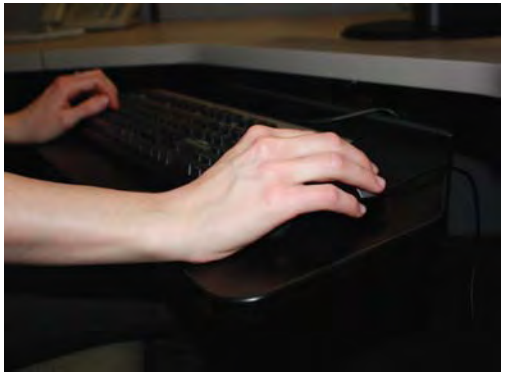
Wrist

Neutral

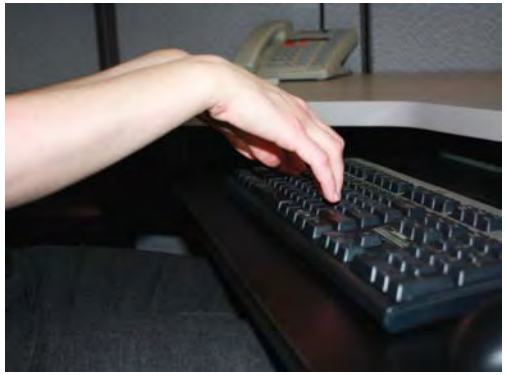




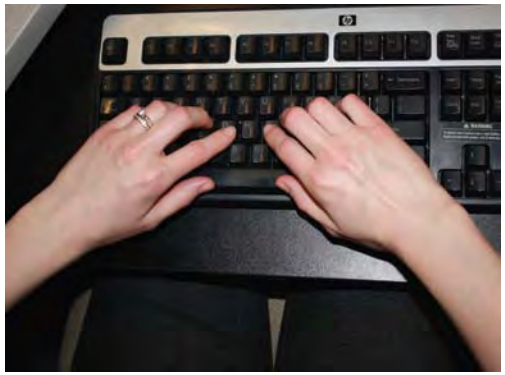
Extension



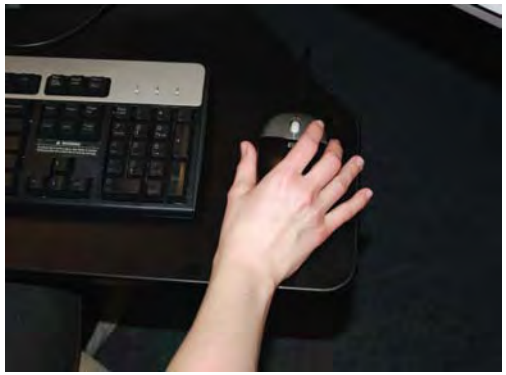
Flexion



Radial Deviation



Ulnar Deviation



The Workstation Should Fit the Worker

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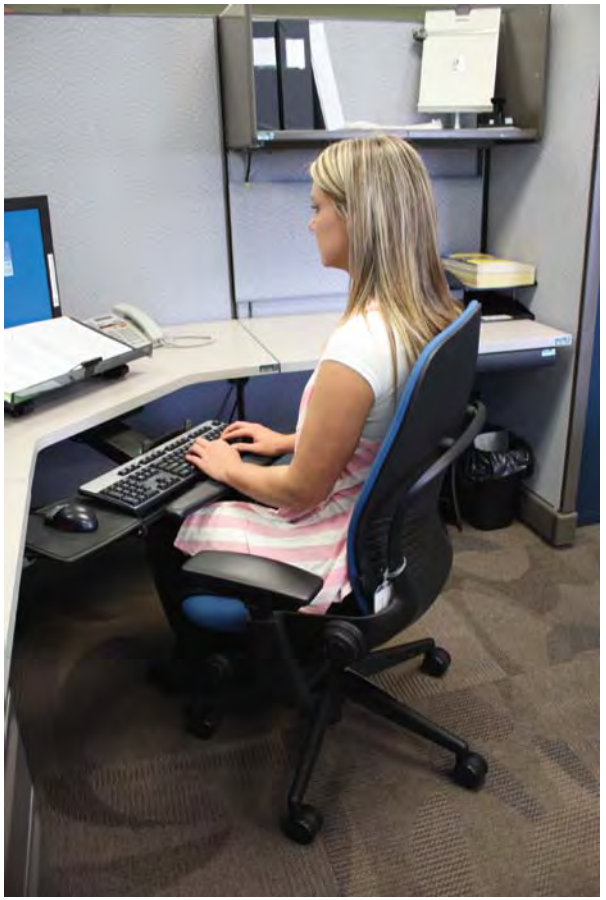
"Why are you complaining? You seem to be adjusting very well to your smaller cubicle!"

Why is the chair the most important piece of equipment?

- All office workers sit at some point to perform work tasks (most sit for most of the working day)
- The chair puts the worker in contact with the workstation
- The chair is the worker's primary support system when sitting
- Sitting requires muscular force
  - The right chair can reduce and/or eliminate muscular forces



Advantages of sitting in a chair adjusted to fit the worker

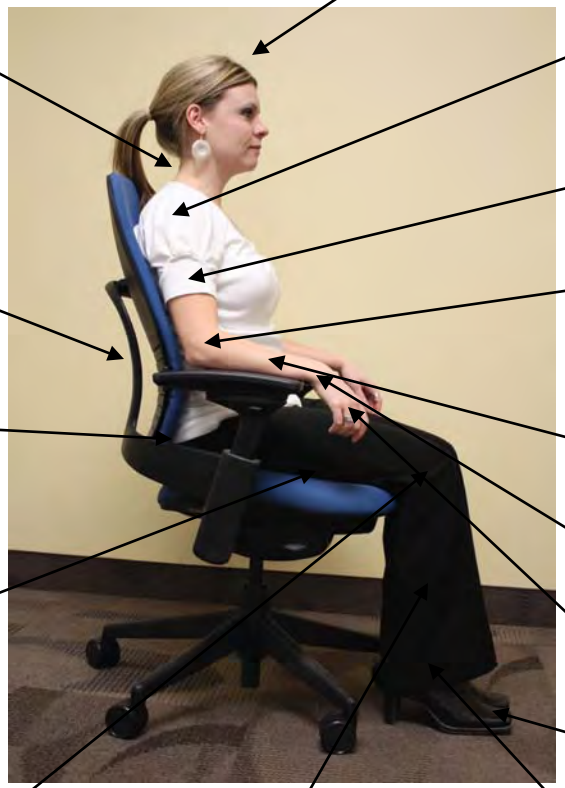
- Increased stability of upper body
- Decreased energy consumption
- Reduced stress on lower extremities
- Decreased static muscular effort
- Less demand on circulatory system

Characteristics of a Good Chair

1. Evenly distributed 5 leg base with a minimum radius of 30 cm (12”)
2. Castors
3. Non slip breathable fabric
4. Dense foam that compresses no more than 2.5 cm (1”)
5. Waterfall seat
6. 360° swivel seat
7. Base with a pneumatic air cylinder
8. Adjustable seat height
9. Minimum seat pan width of 45 cm (18”)
10. Adjustable seat pan depth
11. Adjustable seat pan tilt
12. Adjustable armrest height
13. Adjustable armrest width
14. Adjustable armrest length
15. Concave backrest shape
16. Minimum backrest width of 35 cm (14”)
17. Minimum backrest height of 45 cm to 62.5 cm (18” – 25”)
18. Convex shaped 50 mm (2”) thick lumbar support
19. Adjustable lumbar support
20. Adjustable backrest tilt
21. Easy to operate adjustment controls
22. Adjustable from seated position
23. Adjustability instructions

*Features of a Good Ergonomic Chair
*Chair Report Card

Optimal Working Posture: Sitting



Head: level or slight downward gaze; forward facing; balanced over spine; in line with torso

Neck: straight or in slight flexion; in line with rest of spine

Shoulders: relaxed

Back: in line with head, neck and hips; forms a gentle s curve; lower back in lordosis, fully supported; lumbar support fits into deepest part of lumbar curve

Upper arms: hang naturally at side of body

Elbows: close to body; form an angle slightly > than 90°

Hips: form an angle of 90° to 130°; fully supported

Forearms: generally parallel to floor; inline with wrists

Wrists: straight; inline with forearms and hands

Thighs: roughly parallel to floor; fully supported

Hands: inline with forearms and wrists

Feet: slightly forward; fully supported by floor or footrest

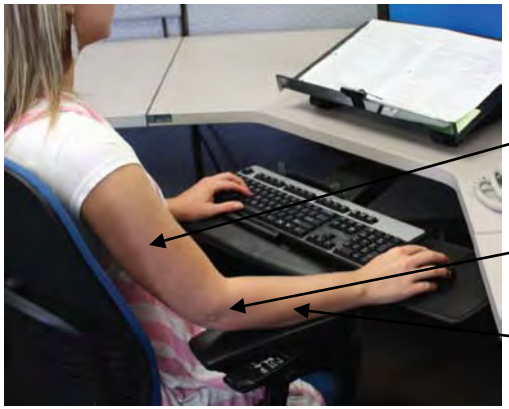
Knees: form an angle of 90° to 110°; slightly lower than hips; gap of 5 cm to 10 cm (2" – 4") between front edge of seat pan and back of knees

Lower legs: slightly forward

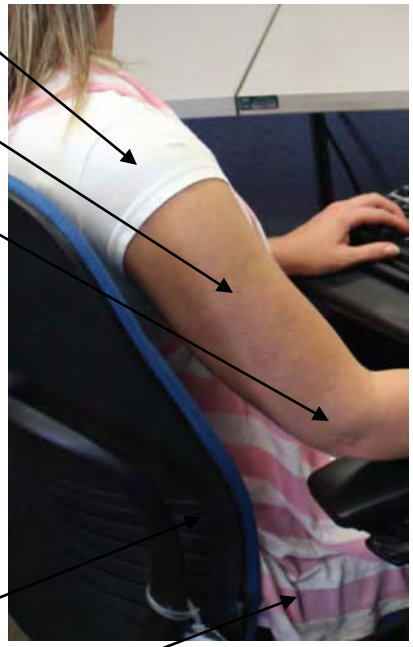
Ankles: form an angle of 90° to 120°

*Computer Workstation - Neutral Sitting Posture
*Steps to Adjust Chair
*Chair Suitability Report
*Computer Workstation Posture Assessment

Optimal Working Posture:
Sitting + Keyboarding + Mousing



Shoulders: relaxed
Upper arms: hang naturally at sides of body
Elbows: close to body; form an angle slightly > than 90°, not resting on any surface
Forearms: generally parallel to floor; inline with wrists
Wrists: straight; inline with forearms and hands
Hands: inline with forearms and wrists, fingers fit comfortably over mouse
Back: inline with head, neck and hips; forms a gentle s curve; lower back in lordosis; lumbar support fits into deepest part of lumbar curve
Hips: form an angle of 90° to 130°; fully supported



*Computer Workstation – Neutral Mousing Sitting Posture
*Keyboard/Mouse Setup
*Steps to Adjust Keyboard/Mouse
*Computer Equipment: Mouse
*Computer Workstation Posture Assessment

Optimal Working Posture:
Sitting + Keyboarding/Mousing + Viewing Monitor

Head: level or slight downward gaze; forward facing; balanced over spine; in line with torso
Neck: straight or in slight flexion; in line with rest of spine
Back: in line with head, neck and hips; forms a gentle s curve; lower back in lordosis, fully supported; lumbar support fits into deepest part of lumbar curve
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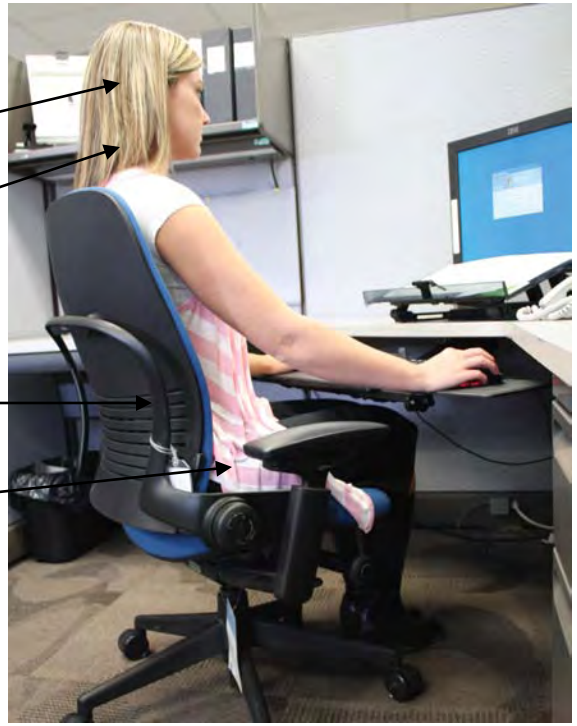
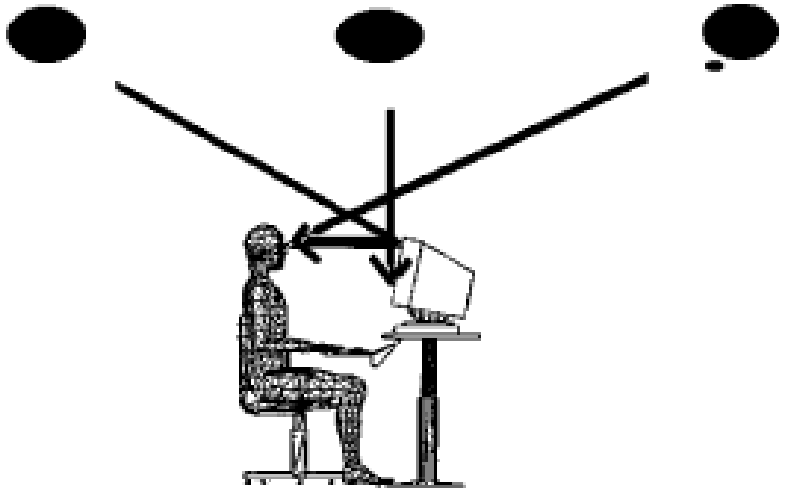


*Monitor Setup
*Steps to Adjust Monitor
*Computer Equipment: Monitor
*Computer Workstation Posture Assessment

Optimal Lighting Setup:
General Illumination + Viewing Monitor + Viewing Source Documents

Control of natural light from windows < 6 m (20') away	Monitor screen 90° to any windows
Adequate, evenly distributed ambient lighting	Flat monitor screen
Workstation located parallel to overhead lighting	Negative contrast screen setting
Task lighting brighter than ambient lighting	Sharp, easy to read, non flickering monitor screen
Task lighting focused on source documents, controls and other visual needs	Anti-glare screen in place (if cannot rearrange workstation to eliminate glare)
Matte finishes on walls, floors and furniture	Clean screen

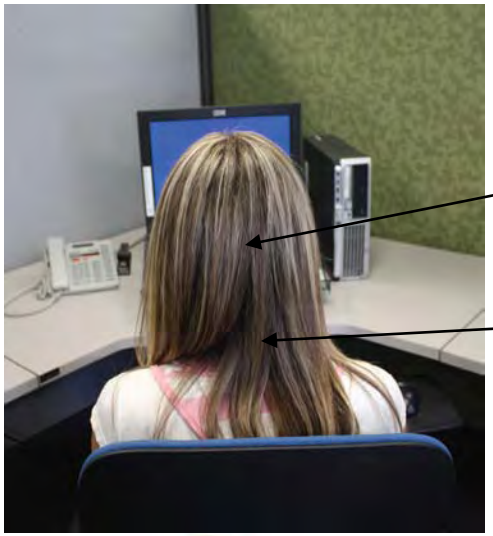


*Lighting Setup
*Steps to Adjust Monitor
*Computer Equipment: Monitor
*Computer Workstation Posture Assessment
*Computer Workstation Report Card

Optimal Working Posture:

Sitting + Keyboarding/Mousing + Viewing Monitor + Viewing Source Documents

Option 1: Document holder positioned:	Option 2: Document holder positioned:
• on same side as worker's dominant eye • directly next to monitor screen • at same distance as monitor screen • at same height as monitor screen • so source document is perpendicular to worker's line of vision	• between keyboard and monitor • in line with worker, keyboard and monitor screen • so source document is perpendicular to the worker's line of vision



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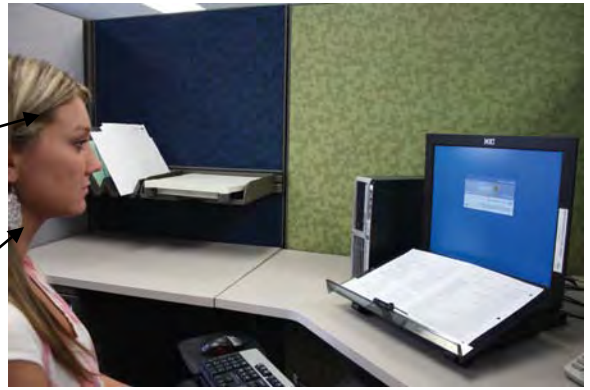
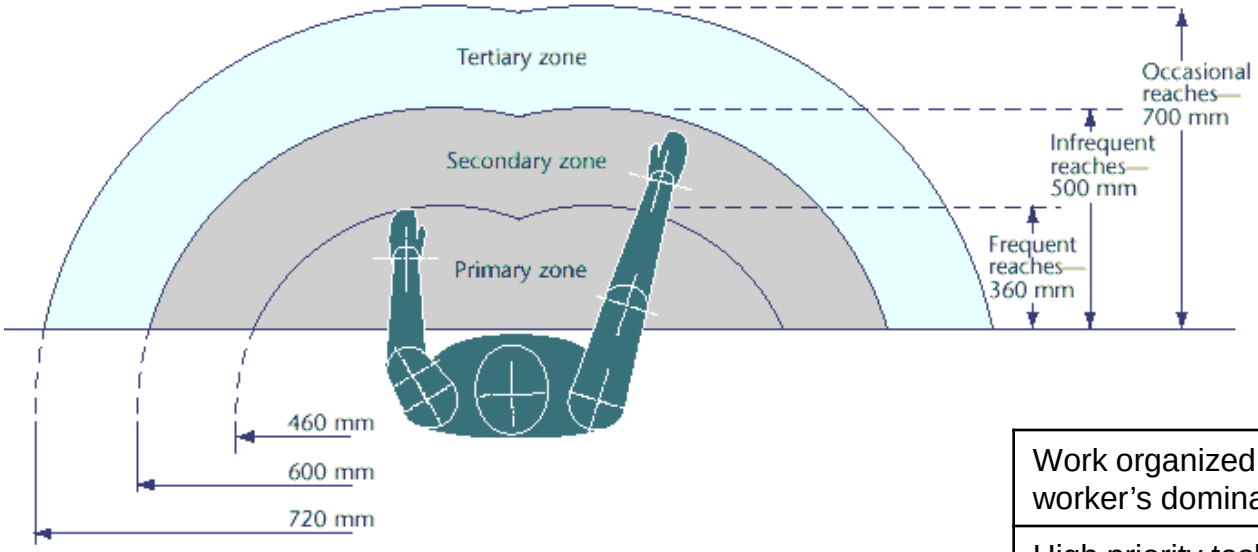


*Document Holder Setup
*Steps to Adjust Document Holder
*Computer Workstation Posture Assessment
*Computer Workstation Report Card

Work Surface Organization



Work organized so it flows towards worker's dominant hand side
High priority tasks/items located within hands reach with elbows at side
Lower priority tasks/items located within hands reach with arm extended
Occasionally performed tasks/used items located just past hands reach with arm extended, some trunk flexion

*Work Organization Setup
*Steps to Adjust Work Organization Setup
*Computer Workstation Posture Assessment
*Computer Workstation Report Card

Work Storage Organization

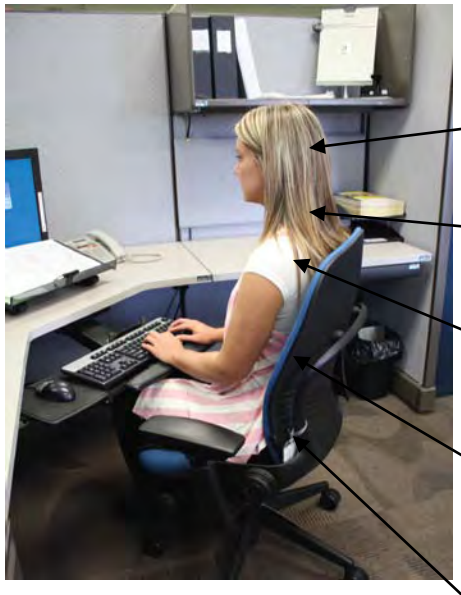
High priority items stored in primary zone
Lower priority items stored in secondary zone
Occasionally used items stored in tertiary zone or further
High priority items stored between knuckles and shoulders
No items stored in the kick space
Clutter free workstation

*Work Organization Setup
*Steps to Adjust Work Organization Setup
*Computer Workstation Posture Assessment
*Computer Workstation Report Card

Optimal Working Posture:

Sitting + Keyboarding/Mousing + Viewing Monitor + Talking on Phone

Telephone located either within or at limit of primary reach zone	Headset provided	If headset, telephone positioned on dominant hand side or directly in front of worker



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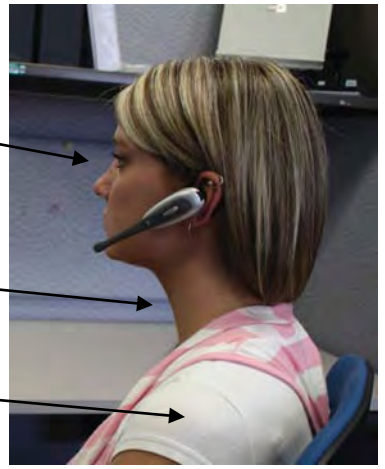
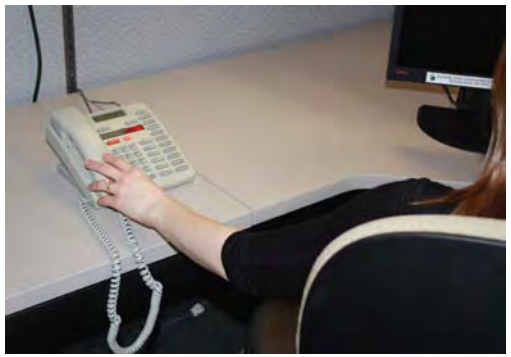




*Work Organization Setup
*Steps to Adjust Work Organization Setup
*Computer Workstation Posture Assessment
*Computer Workstation Report Card

Features of Good Computer Workstation Design

1. Adjustability
2. Ease of adjustability
3. Sufficient workstation area
4. Semicircle (corner) design
5. Stable work surface
6. Neutral coloured non reflective work surface
7. Flat smooth work surface
8. Rounded corners free of sharp edges
9. Height adjustable work surface
10. Sufficient work surface depth to accommodate keyboard and monitor
11. Sufficient work surface area to accommodate required equipment/resources
12. Sufficient work surface area to accommodate tasks to be performed
13. Reading/writing work surface and corresponding kick space on worker's dominant hand side
14. Sufficient clearance between top of worker's thighs and bottom of work surface
15. Sufficient under reading/writing area kick space
16. Sufficient under keyboard kick space
17. Drawers located within comfortable reach
18. Accessible storage space
19. Sufficient storage space
20. Stable keyboard/mouse tray
21. Height adjustable keyboard/mouse tray
22. Distance adjustable keyboard/mouse tray
23. Tilt adjustable keyboard/mouse tray (horizontal to reverse)
24. Angle adjustable keyboard/mouse tray
25. Sufficient keyboard/mouse tray surface area to accommodate both keyboard and mouse
26. Mouse tray
27. Cable routing system

*Features of a Good Computer Workstation Design
*Computer Workstation Report Card

Caution: Anything can be advertised as being ergonomically correct

"Suspending your keyboard from the ceiling forces you to sit up straight, thus reducing fatigue."

Practical

- Features of a Good Ergonomic Chair
- Neutral Sitting Posture
- Features of a Good Computer Workstation Design
- Neutral Keyboarding Sitting Posture
- Neutral Mousing Sitting Posture
- Keyboard/Mouse Setup
- Monitor Setup
- Lighting Setup
- Document Holder Setup
- Work Organization Setup
- Steps to Adjust Fact Sheets
  - Steps to Adjust Chair
  - Steps to Adjust Keyboard/Mouse
  - Steps to Adjust Monitor
  - Steps to Adjust Document Holder
  - Steps to Adjust Work Organization
- Assessment Forms
  - Chair Report Card
  - Chair Suitability Report
  - Computer Workstation Report Card
  - Computer Workstation Posture Assessment
- Tool Kit
  - Goniometer (beveled protractor)
  - Level
  - Tape measure
  - Pen
  - Clipboard

Questions

CWAT Group Exam

For each image, identify:

- What is wrong?
- Why it is wrong or what is the correct posture?
- What would you do to fix the problem?

Image 1

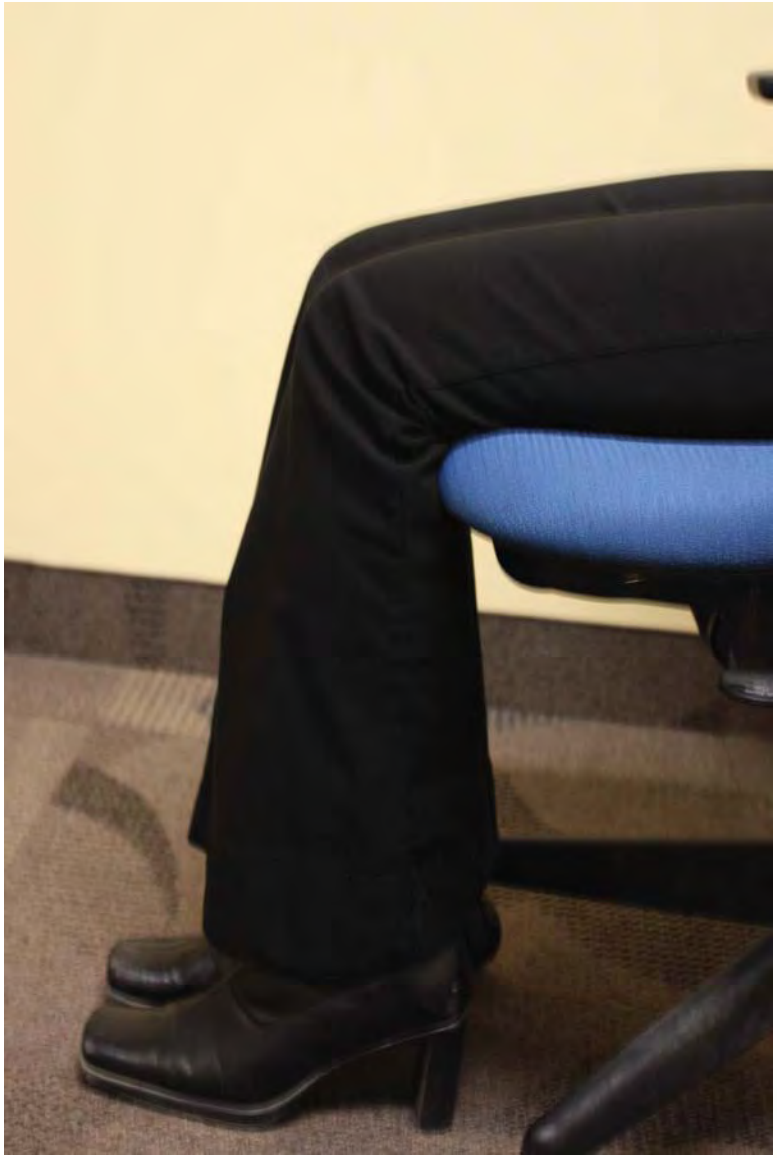


Image 2

Image 3

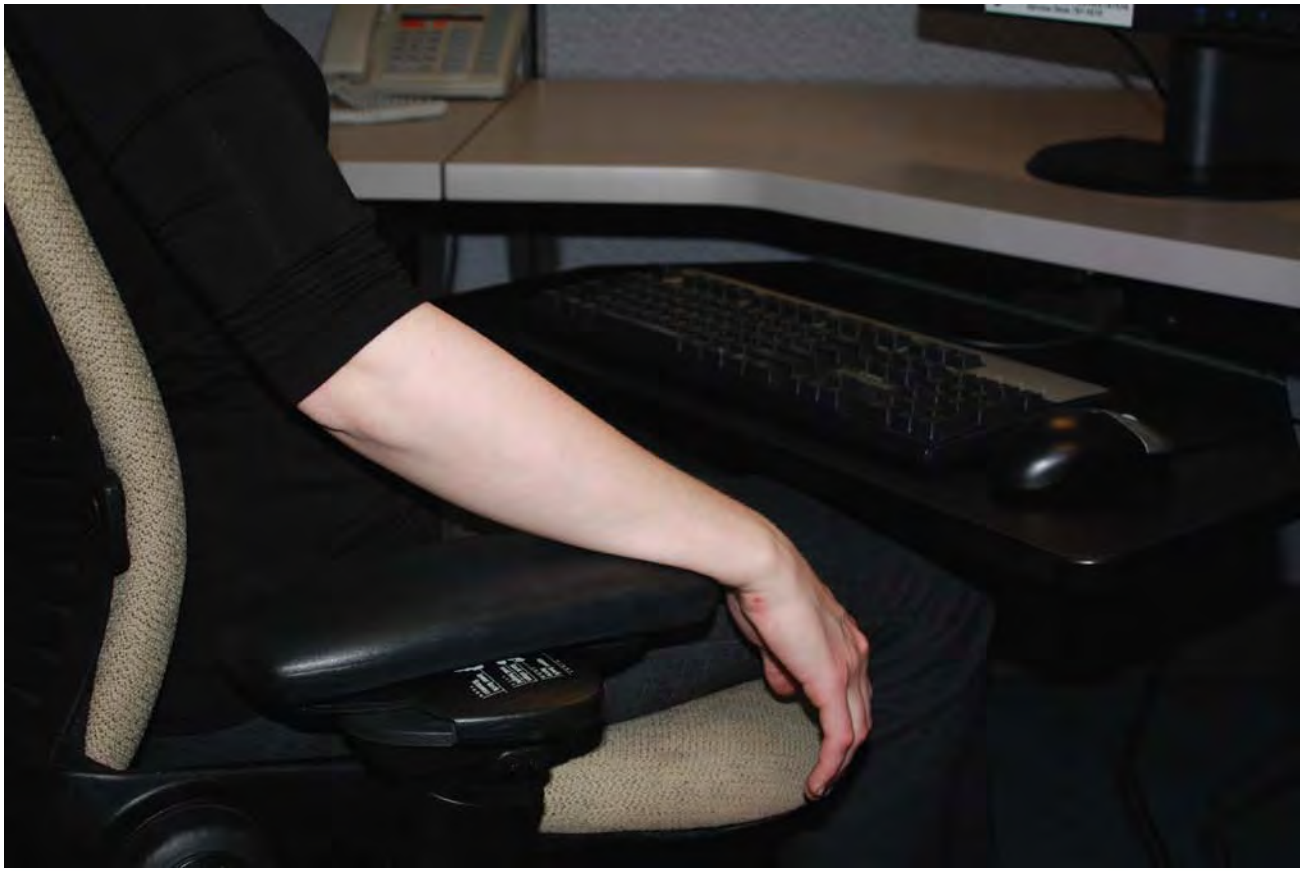


Image 4

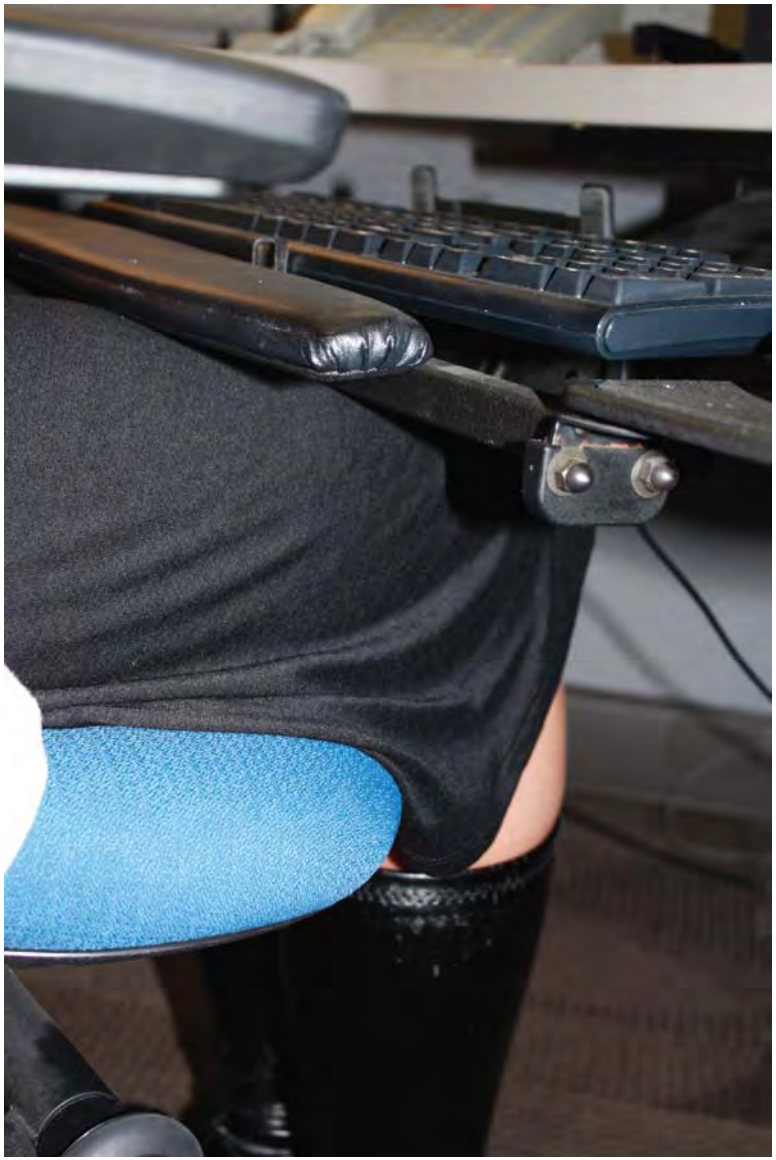
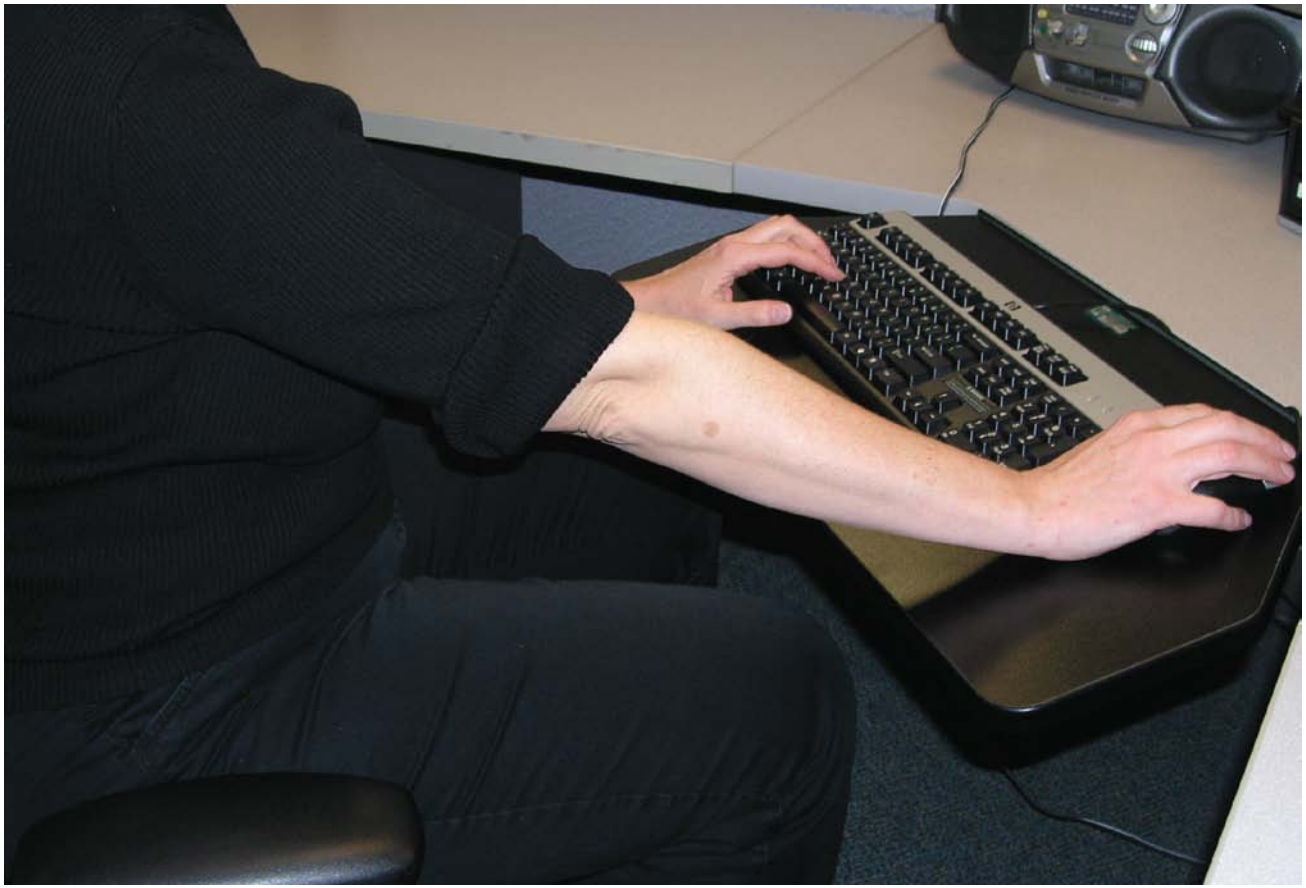


Image 5



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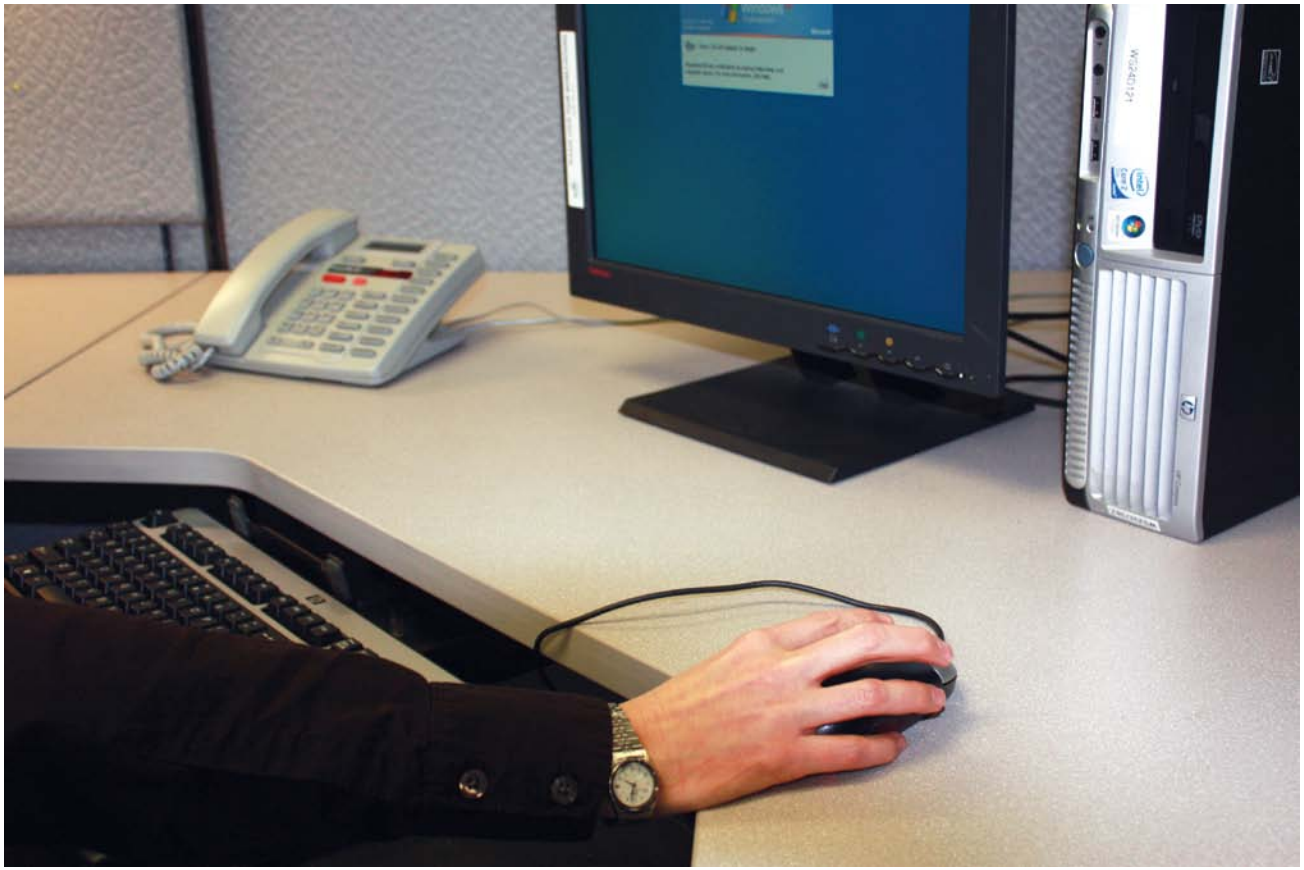

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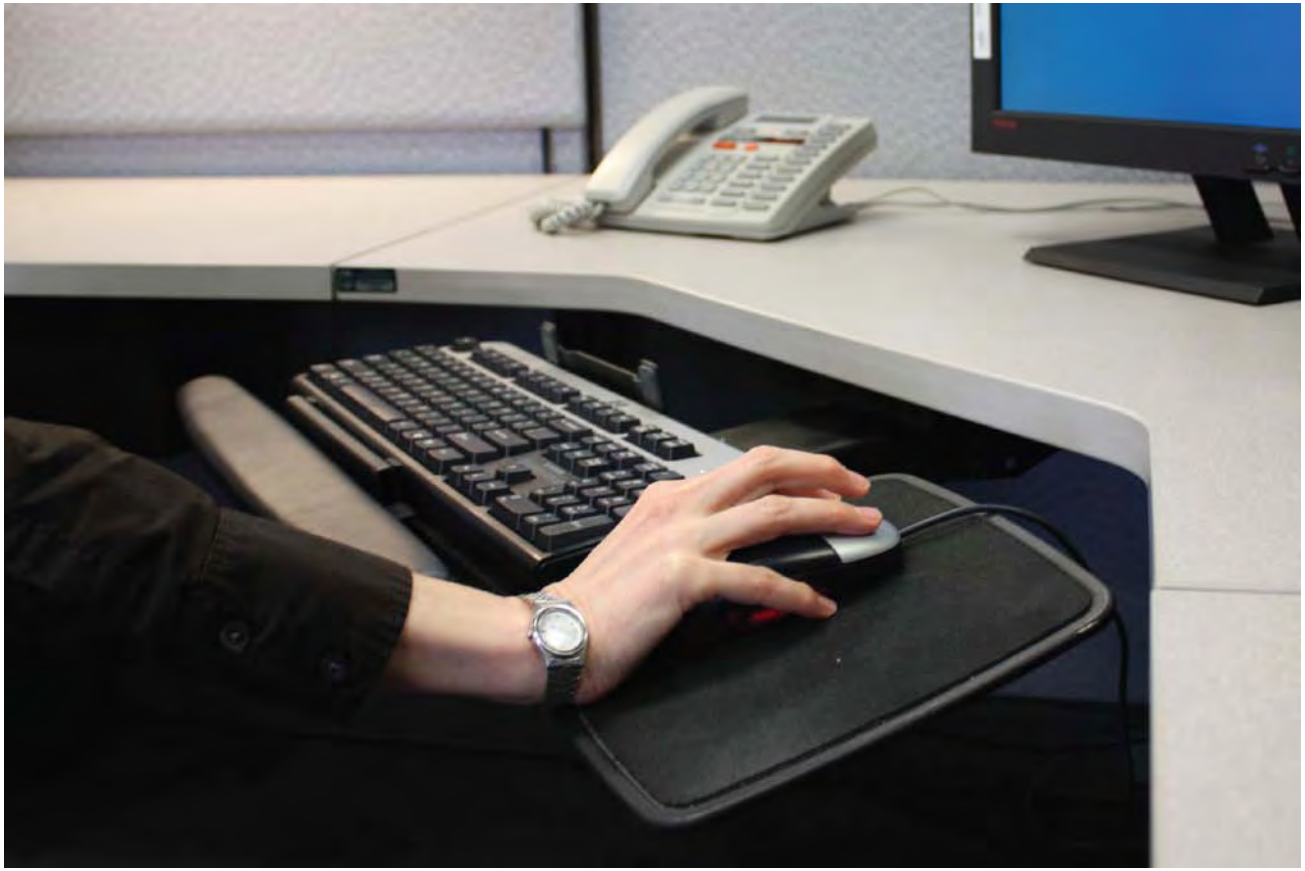

Image 8

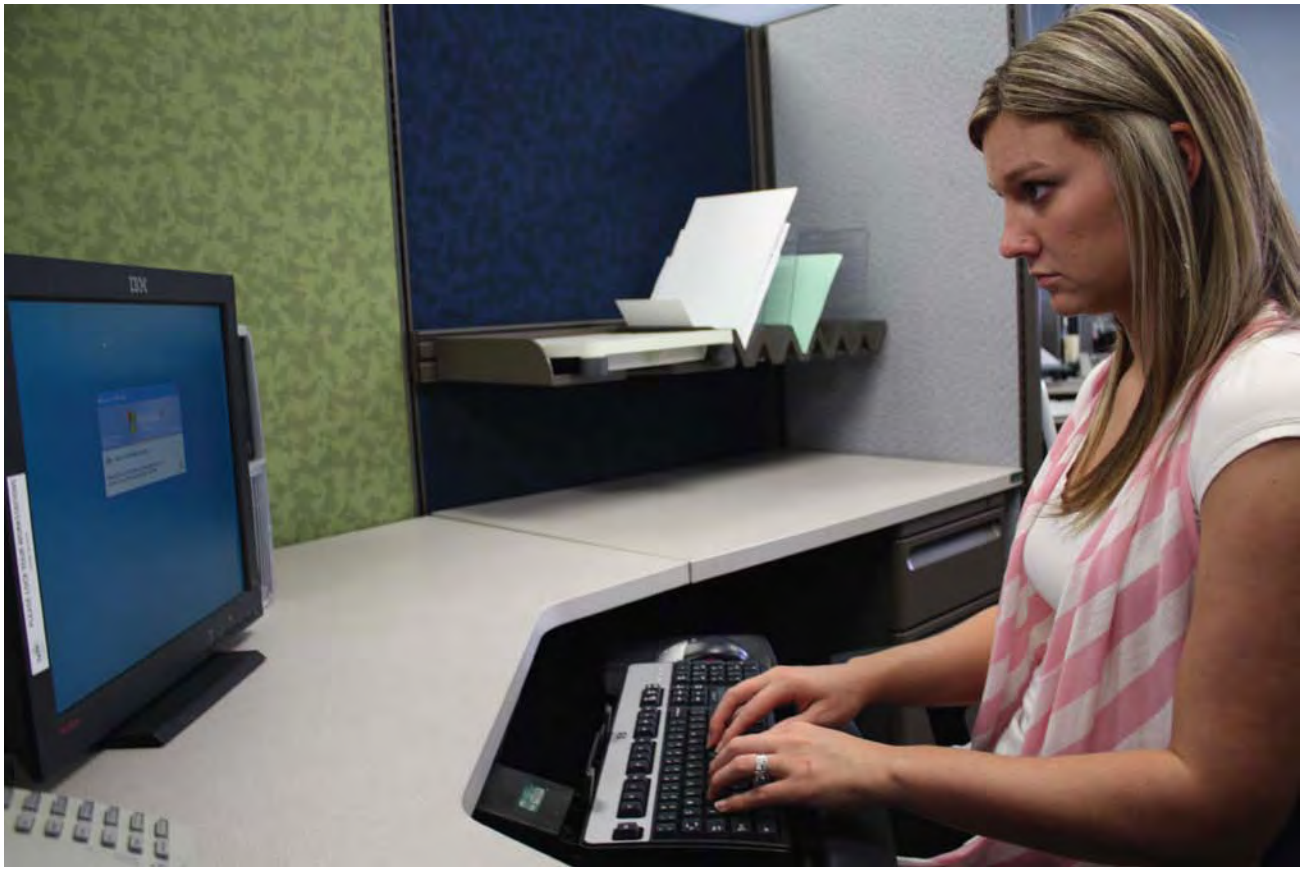

Image 9

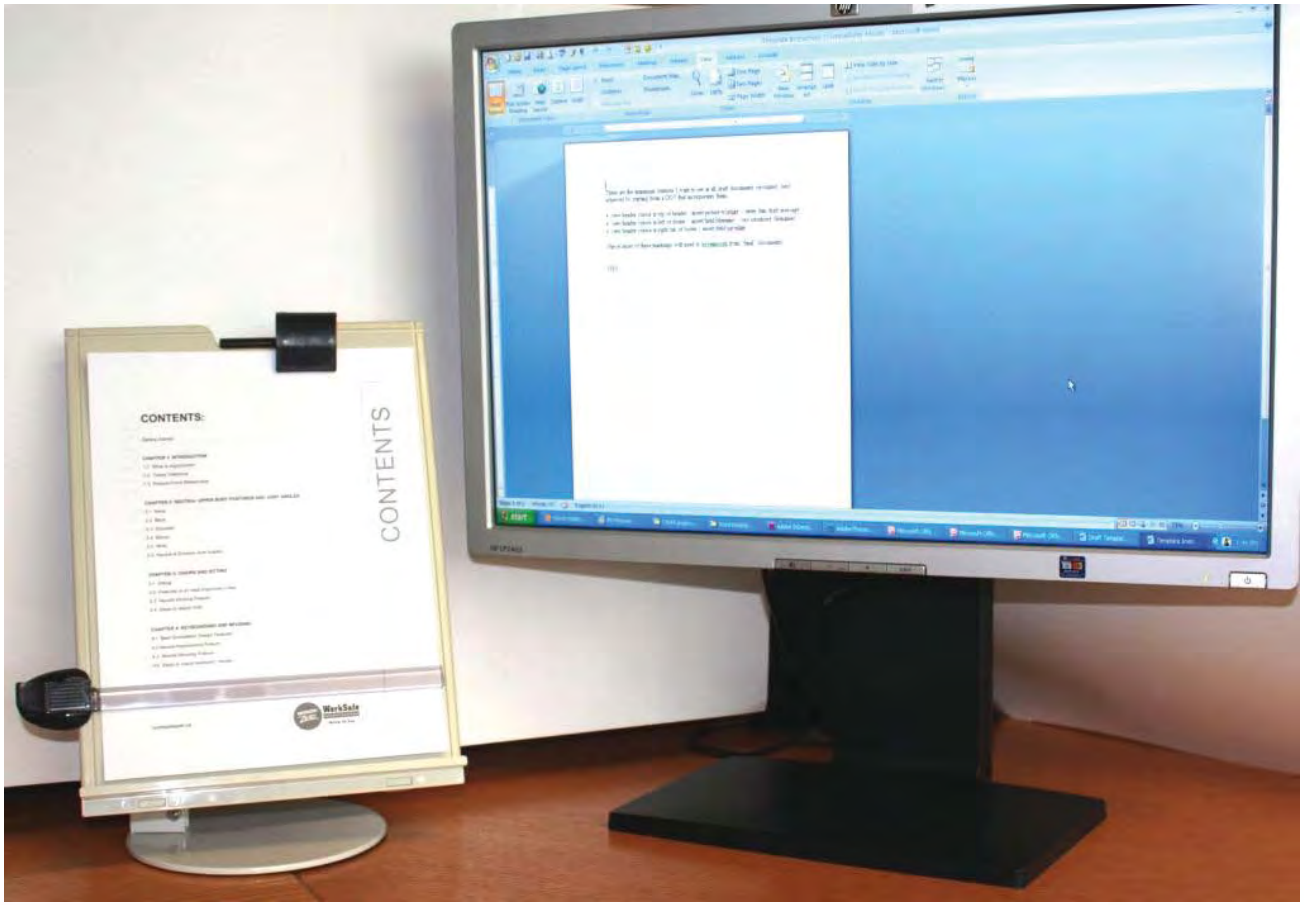

Image 10

Image 11