The Future of Ergonomics: Compliance with ergonomics standards in the face of changing technology and non-traditional work environments
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AGENDA

- Evolving Environments
- CSA Z412-17: Psychosocial Hazards, Posture, Mobile Devices
- Hoteling Stations
- Home Offices
- Vehicle Workstations

EVOLVING ENVIRONMENTS

- Increased use of technology
  - Less physical and mental “breaks”
  - Work bleeds into personal time

- More compact technology
  - Bent neck postures
  - Hand/wrist issues

- Flexible work environments
  - Less control over set-up & furniture

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**IMPACT ON EMPLOYEES**

- Loss of distinction between work and personal time
  - Culture of “always on”
- Decreased social contact
  - Impacts mental well being
  - Isolation
  - ↓ Resilience
- Increased cognitive demands
  - Multitasking
  - Pressure to work faster
- Increased physical demands
  - ↑ hours
  - ↓ movement
  - Non-ideal equipment

**WHAT IS CSA Z412-17**

- Application Standard for Workplace Ergonomics
  - 3rd Edition, 2017
- First overhaul since 2000
  - Updates for new technology
  - Guideline → Standard
- Applies to all office users, including non-traditional
  - Vehicles, home offices, hoteling
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WHAT IS CSA Z412-17

- Standards for a comprehensive Ergonomics Program
- Standards for ergonomic design parameters for office furniture
- Outlines mandatory ergonomic requirements
- Not currently legally enforceable

What does it say about psychosocial factors, posture and mobile devices?

PSYCHOSOCIAL FACTORS

Hazard Identification & Control
- Physical hazards
- Psychosocial hazards
  - Design & organization of work
    - Unclear expectations
    - High psychological demands/workload
    - Lack of control/engagement
  - Hazards =
    - Risk to mental health
    - Risk of onset/aggravation of MSDs

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PSYCHOSOCIAL FACTORS

Do you …

• Provide clear work expectations?
• Provide timely and clear feedback?
• Provide opportunities for growth?
• Provide autonomy, work flexibility?
• Have a process for employees to voice concerns?
• Have a process for managing cognitive/mental health limitations?
• Conduct CDAs on mentally demanding jobs?

VARIABLE POSTURES

Last edition relied heavily on traditional sitting
Encourages more movement & wider range of postures

• Avoid prolonged sitting or standing in only 1 posture
• Reclined, Upright*, Forward Tilt, Semi-Standing, Standing

Source: Figure A.1, CSA-Z412-17 Office ergonomics – An application standard for workplace ergonomics. © 2017 Canadian Standards Association
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### VARIABLE POSTURES

Do you have...
- equipment to achieve “reference postures”?
- more than one style of chair (large, petite)?
- chairs with adjustable seat pan depth?
- training on the use of equipment?

### TABLETS & MOBILE PHONES

Limit use of mobile equipment to “short duration”
- Tablets, cell phones
- Forward head position/raised arm
- Tablet use: static postures limited to <10 min (Chau & Wells, 2015)
- Increase rest breaks....
  - Unless in a “reference posture”
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REFERENCE POSTURES

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Touch screen entry

- External devices: keyboards, stylus
- Alternate between thumb and fingers; fingers preferred
- Thumb pad not tip
- Alternate hands; cautious with grip posture
- Use abbreviations and predictive text

TABLETS & MOBILE PHONES

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LAPTOP USE

If used for extended durations
- External keyboard
- External mouse
- External monitor (or raise screen)

Laptops should only be used as a “laptop” in transit, NOT at a workstation

MOBILE EQUIPMENT

Do you...
- Provide external keyboards and mice?
- Provide assessments (virtual?) to ensure provision of appropriate equipment?
- Discourage employees from using their phones to respond to email?
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HOTELING STATIONS
CASE STUDY

XYZ Company has implemented non-permanent workstations for sales staff are not in the office regularly

What are the challenges?

HOTELING STATIONS
CHALLENGES

- Failure to adjust equipment
  - Knowledge
  - Lack motivation (single day)
- Lack of proper equipment
  - External devices
  - Customized equipment (e.g. footrests)
- Decreased social contact?
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HOTELING STATIONS

- Training
- Ease & Range of Adjustability
  - Chairs
  - Keyboard/mouse surface
  - Monitors
- Equipment variety
  - External devices
  - Footrests
  - Alternative devices
- Availability of assessments by a person “competent in ergonomics”

OFFICE SET-UP

- Does the chair support the low back?
- Are the feet supported (90° at hips and knees)?
- Are the elbows at 90° while typing/mousing?
- Is the neck upright, top of monitor level with the eyes?
- Are external devices in use for periods >30 minutes?
- Are the wrists straight?
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HOME OFFICES

CASE STUDY

ABC Company has a “work from home” policy

Employees are provided with a laptop

What are the challenges?

HOME OFFICES

CHALLENGES

Failure to adjust equipment
- Knowledge
- Lack motivation (single day)

Lack of proper equipment
- External devices
- Seating
- Footrests
- $$$

Psychosocial stressors
- Social contact
- Work/life balance
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HOME OFFICES

CONSIDERATIONS

- Training
  - Coaching
  - Virtual Assessments
  - Webinar
- Minimum equipment standards
  - Chair
  - External keyboard/mouse
  - Riser for laptop
- Equipment budget?

HOME OFFICE OPTIONS

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OFFICE SET-UP

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- Are the feet supported (90° at hips and knees)?
- Are the elbows at 90°
- Is the top of monitor level with the eyes?
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- Are the wrists straight?

VEHICLE “WORKSTATIONS”

- Sales staff use their computers in their vehicles between site visits
- What are the challenges?

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**VEHICLE “WORKSTATIONS”**

**CHALLENGES**

- Lack of adjustability
- Tendency to twist
- Restricted space

**CONSIDERATIONS**

- Training on use
- Ease and Range of Adjustability
  - Height-adjustability
  - Swivel
- Type of equipment
  - Laptop, tablet, phone
- Frequency of use
- Glare
- Safety issues

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**In-Vehicle Computing Ergonomics Checklist**

**Job Title:**

**Date:**

**Analyst:**

<table>
<thead>
<tr>
<th>Assessment Area</th>
<th>Recommendation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driver Seat</strong></td>
<td></td>
</tr>
<tr>
<td>Is there space between the seat pan and the back of the legs?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Do the seat pan side supports cradle the thighs?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Is the seat cushion soft at the front and firm under the buttocks?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Is the headrest tilted?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Does the seat back have a curved lumbar support?</td>
<td>YES, NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Upper Body</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Can driver reach all vehicle controls (steering, wiper, temperature, etc.) while seated?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Is the steering wheel position adjustable?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Is there sufficient headroom in the vehicle?</td>
<td>YES, NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Legs/Feet</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Can driver exit the vehicle without adjusting the seat and/or steering wheel position?</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Can driver exit vehicle with 3-point contact?</td>
<td>YES, NO</td>
</tr>
</tbody>
</table>

Source: [www.msdprevention.com](http://www.msdprevention.com)

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**Vehicle Ergonomics Checklist**

**GOAL:**

**Improve Posture**

**Change Posture**

**Ergonomic Considerations to Reduce Risk of Discomfort**

- **Seating**
  - The backrest does not obstruct the driver’s view
  - Seat is reclined 100-110 degrees
  - Lumbar adjustment supports the low back (belt level): (adjust up/down, in/out)
  - Middle of the headrest is level with the ears
  - Headrest does not thrust the head forward
  - Seat has been raised to optimize visual requirements
  - Seat pan is tilted to support the full length of the thighs
  - Knees are even with or slightly below the hip joint
  - Seat pan depth allows 2-3 fingers of space between the seat and back of the calves (consider a lumbar cushion if too deep)
  - Seat does not cause any pressure points
  - Wallet is not in the back pocket

- **Steering Wheel and Mirrors**
  - Height, angle, and depth of steering wheel are adjusted to promote neutral shoulder and arm posture (no reaching and elbows close to body)
  - No forceful gripping of the steering wheel
  - All mirrors are adjusted to minimize twisting and allow good lines of sight

- **Pedals**
  - Seat is positioned so the pedals can be fully depressed without shifting hips or using the toes
  - The knees do not roll out to the sides - they point straight ahead

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## Vehicle Ergonomics Checklist

**GOAL:**

**Improve Posture**

**Change Posture**

<table>
<thead>
<tr>
<th>Ergonomic Considerations to Reduce Risk of Discomfort</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Considerations</strong></td>
<td></td>
</tr>
<tr>
<td>Driver can get in/out of the vehicle slowly and with control, and minimize twisting through the neck and lower back</td>
<td>☐</td>
</tr>
<tr>
<td>Driver can get out of the vehicle and move around every 1-2 hours</td>
<td>☐</td>
</tr>
<tr>
<td>Driver is encouraged to walk and stretch after prolonged sitting and before lifting</td>
<td>☐</td>
</tr>
<tr>
<td><strong>Mobile Computer — if applicable</strong></td>
<td></td>
</tr>
<tr>
<td>The computer is adjustable (height, angle, swivel)</td>
<td>☐</td>
</tr>
<tr>
<td>The driver can reach the computer without twisting the back</td>
<td>☐</td>
</tr>
<tr>
<td>The driver can operate the keyboard and mouse (if available) at elbow height, with the arms close to the body</td>
<td>☐</td>
</tr>
<tr>
<td>The computer can be adjusted quickly, without the need for tools</td>
<td>☐</td>
</tr>
<tr>
<td>The computer can be safely locked out of the way while driving</td>
<td>☐</td>
</tr>
<tr>
<td><strong>Vehicle Purchase Considerations — When selecting new vehicles</strong></td>
<td></td>
</tr>
<tr>
<td>The seat pan is comfortable (not too wide or narrow, bolsters not too hard)</td>
<td>☐</td>
</tr>
<tr>
<td>There is sufficient head clearance for taller drivers</td>
<td>☐</td>
</tr>
<tr>
<td>Vibration is minimized</td>
<td>☐</td>
</tr>
<tr>
<td>All drivers can comfortably see and reach all displays and controls</td>
<td>☐</td>
</tr>
<tr>
<td>Controls are easy to use (not too small or narrow to grip)</td>
<td>☐</td>
</tr>
</tbody>
</table>
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