Evidence-based Prevention of Musculoskeletal Disorders in the Aging Workforce

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Conflict of Interest / Disclosures

• The author declares that there is no conflict of interest.
Learning Objectives

1. Define Work-Related Musculoskeletal Disorders (WMSDs);
2. Describe how individuals become more susceptible to MSD in the workplace as they age;
3. Identify workplace factors contributing to musculoskeletal system disorders;
4. Describe strategies to reduce musculoskeletal system disorders among older workers; and
5. Describe strategies to prevent musculoskeletal system disorders among older workers.

What are MSDs?

“Musculoskeletal disorders (MSD) are injuries and disorders of the musculoskeletal system... where exposure to various risk factors present in the workplace... may have either contributed to the disorders' development, or aggravated a pre-existing condition”

(OHSCO MSD Strategy Development Committee, 2005)
MSDs Have a Substantial Work Related Component

Risk factors for upper limb RSI/MSD in a large Canadian office

Relative Risk of Having ‘RSI’

Polanyi et al., (1998)

MSDs Have a Substantial Work Related Component

- Risk factors for Low Back Pain in a Canadian auto assembly plant

Relative Risk of Low Back Pain

Example: Approaches to Prevention of Low Back MSD

Many approaches are talked about...

- **Back belts?**
- **Product redesign?**
- **Job enlargement?**
- **Rebalancing?**
- **Exercise programs?**
- **Lift Tables?**
- **Back school?**
- **Adjustable Platforms?**
- **Stretching programs?**
- **Hoists?**
- **Health promotion?**
- **Job rotation?**
- **Adjustable furniture**
- **Teams?**
- **Improved Tools?**

Strategies to prevent low back MSD

<table>
<thead>
<tr>
<th>Eliminate/Substitute</th>
<th>Redesign (Product)</th>
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</thead>
<tbody>
<tr>
<td>Engineering Controls</td>
<td>Platforms, Hoists, Rebalancing (Process)</td>
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<tr>
<td>Administrative Controls</td>
<td>Job enlargement, Job rotation, Teams, etc</td>
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<tr>
<td>Personal Protective Equipment</td>
<td>Back belts, etc</td>
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<tr>
<td>Training</td>
<td>Back school, etc</td>
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<tr>
<td>Increase workers’ capacity</td>
<td>Health Promotion, Exercise programs, Stretching programs, etc</td>
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One Root Cause of Low Back Pain

High cumulative loads on the low back

- Lifting/pushing/pulling of light to moderate loads many times per shift
- Holding non-upright trunk postures for long duration

Interventions for Low Back Pain

- Re-position load
  \[\text{PRODUCT-PROCESS}\]
- Reduce forces
  \[\text{PRODUCT-PROCESS}\]
- Reduce proportion of cycle loaded or total time loaded
  \[\text{PRODUCT-PROCESS-ADMIN}\]
- Reduce number of movements
  \[\text{PRODUCT-PROCESS-ADMIN}\]
Research shows we can prevent MSDs now

- Mechanical lift-assists installed in acute and chronic care facilities
- Earlier return to work when lift assists used
- Newer ceiling lifts likely to produce even larger reductions

Consider physical and work organizational factors

Because there are both physical and work environment (psychosocial) factors that contribute to disability:
- Physical: e.g., Forces, postures repetition
- Work Environment: e.g., Job Control, Supervisor Support

Consider physical and work organizational factors in prevention activities

Evanoff et al 2003, Engst et al 2005

NRC/IOM (2001)
Need to consider physical and work organizational factors

Example: Garage mechanics

- Injured mechanics are told to change working techniques and use lifting equipment
- Mechanics coped best when they were supported by managers and supervisors
- Achieving positive results from MSD prevention activities requires that organizations create positive attitudes towards work modifications.

Adapting working conditions and career progression to combat MSDs

French printing company,

- Older women working in ‘finishing’ – high absenteeism from musculoskeletal disorders
  - ‘Standard’ ergonomic solutions e.g. alter workstations to avoid poor postures & repetitive tasks
- Women ‘trapped’ in finishing work, men quickly promoted -> longer exposure to poor conditions
  - Recommendations concerning career paths and skills recognition
The chair – increased exposure

• Risks of sitting at an ergonomic workstation all day everyday until 70 years-old?

Too late to start at work...

Neck pain and back pain associated with school furniture and bag weight
Buckle et al Surrey University 2007

Swedish physiotherapists promote ergonomics knowledge and application in primary schools
Primary, Secondary and Tertiary Prevention of MSDs

- "...provide workplaces that are comfortable when we are well and accommodating when we are ill." (Morken et al 2002)
- Combining primary and secondary preventive interventions can yield greater impact than the sum of impacts from separately implemented interventions. (Frank et al 2005)
- "...clinical management + ergonomic modification best combination..." (Loisel et al 1997 Sherbrooke Model of Workplace Disability Prevention)

<table>
<thead>
<tr>
<th>Time, weeks</th>
<th>Symptoms/Disability</th>
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<tbody>
<tr>
<td></td>
<td>Primary</td>
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<td>Secondary</td>
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<td>Tertiary</td>
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<tr>
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<td>Secondary</td>
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</table>

- **Primary:** Reduce MSD risk factors to prevent creation or aggravation of MSD, and permit the largest possible workforce to perform job... work smarter not harder
- **Secondary:** Monitoring and reporting schemes to detect MSD and initiate abatement of risk factors and restoration of health
- **Tertiary:** Disability resulting in Lost Time triggering abatement of risk factors, accommodation to disability, restoration of musculoskeletal health and early and safe return to work
- **Secondary:** Monitoring and reporting schemes to detect MSD and initiate abatement of risk factors and restoration of health
Who benefits from (1°, 2°, 3°) prevention initiatives?

- Workers whose symptoms developed as a direct result of current work
- Workers who have cumulative damage from previous work experiences
- Workers who develop back pain after a weekend’s yard work or caring for their small children... they have responsibilities outside work.
- Workers who have age related changes

You don’t have to reinvent the wheel!

Examples:
A) Reducing vibration for LBP & HAVS
B) Improving manual materials handling for slips and falls
C) Maintaining adequate lighting for tasks
D) Improving social support for accommodation
E) Designing for lower forces and improved postures
F) Adding stretching exercises for flexibility
Integrated policies in & outside workplace

Better prevention for all

Career development

Working time

Occupational health services
Labour inspection
Public health
Pensions and social security
Employment – anti-discrimination
Vocational training

LifeLongLearning

Design of work and work-organisation

Individual competencies

Leadership, involvement, preventive culture, attitudes

Thank you / Questions?

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