Aging Workers: Preserving Experience, Maintaining Safety

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Background

Older Workforce is Growing

Older Workforce has grown > 5% annually compared to .7 for other age groups

(Toosi, 2012)
Percent increase in employment by age and sex, 1977-2007

- Age 16 and over: 59
- Age 65 and over: 101
- Men, Age 65 and over: 75
- Women, Age 65 and over: 147
- Age 65-69: 85
- Age 70-74: 98
- Age 75 and over: 172

Aging and Injury

Lower Injury Rate

- Lower injury rate for older workers due to
  - Experience
  - “Working smarter not harder”
  - Less physical work
  - Underreporting

2002 Occupational Injuries

BLS, 2004
However 2011 reports........

Older workers had higher rates:
- falls on the same level
- fractures
- hip injuries

As compared with younger workers and workers of all ages.
Aging and Injury: Higher Injury Severity

Mean days away from work per injury:

- >65: 15
- 55 - 64: 12
- 46 - 54: 11
- 35 - 45: 6
- 25 - 34: 5


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With age, job tasks demand a greater percent of employee capabilities.
Presentation Outline

- Tacit knowledge: Value of Experience
- Age-Related Changes: Impact on Work
- Recommendations: Reducing the Risk
- Proactive Approaches
Preserving Experience
Decision-making and Tacit Knowledge
What do we know about tacit Knowledge?? Myths...
The "Iceberg" metaphor describes the relationship between Explicit & Tacit Knowledge.
Tacit Knowledge and Older Workers.....

Create Optimal Work Environment for Older Workers to

• Use skills, learn, be challenged
• Transfer Knowledge
• Collaborate on Intergenerational teams
• Mentor younger
Age-Related Changes That Impact Work Performance
Changes in Strength

Lose 20% to 30% of muscle mass as we age.

Due to decrease in muscle mass and lack of use.

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Muscle Strength and Age
Impact on Work
Grip Strength and Age

- Grip decreases by 50% between 25 and 80
  - 50  20%
  - 60  20%
  - 65  25%

- Thumb Arthritis common
Thumb Arthritis

- Arthritis at base of thumb common over age of 50
Use of thumb resistance.....
Changes in Joint Cartilage

Normal joint

Joint affected by osteoarthritis

Bone spur (osteophyte)

Thinned cartilage

Cartilage fragments
Tendons Less Flexible and Resilient

There are exceptions!!
Joint Replacements not uncommon
Changes in Vertebral Discs

90% have DDD by age 50
DDD reduces ability to stand for long durations

As vertebra degenerate and curve, core muscles relax
Trunk Bending
Greater Risk for Older Adults

770 lbs Action limit for a 40yo; 400 lbs. for a 60 year old!
Shoulder Joint and Age
Shoulder Impingement
Rotator Cuff Injuries Peak in Mid-40s
Combined Shoulder and Neck Concerns
Neck Joints and Age

- Limited motion
- Decreased blood flow in vertebral artery with neck rotation and extension
- Worse with preexisting vascular issues

Neck Rotation decreases blood flow in Vertebral Artery

Head tilt found to fully occlude vertebral artery (Choi, 2011)
Typical bifocal Posture stresses neck

Chin elevation increases vertebral artery 80%
Changes in Aerobic Capacity

At 65, endurance is 70% of a 25 yo. Work harder to accomplish same tasks.
Balance, Reaction Time, and Fall Risk

- Older workers >65 y have 90% of all falls
- Higher rate of falls on same level
- 30% of same-level falls result in >21 days lost time

Consequences of falls are worse
Balance allows you to maintain position while working.
Changes in Balance

- Changes in vestibular system (body sense, speed, equilibrium, stability)

Causes
- Difficulty walking on uneven surface
- Difficulty catching self
- Moving away from COG
Potential for Falls Increased by...

- Low Vision
- Hypotension
- Weakness in legs and core
- Medication side effects
- Underlying chronic conditions
- Misjudging
Typical Changes in Vision
Macular Degeneration

What It's Like

This is how a street scene looks with normal vision.

Example of a Macular Degeneration
Glaucoma

What It's Like

This is how a street scene looks with normal vision.

Example of Glaucoma.
Common Visual Changes

- Difficulty reading small print
- Difficulty seeing in low light
- Changes in depth perception
- Difficulty refocusing
- Sensitivity to glare

(Bonder & Wagner, 2001; Fisk et al., 2004)
Falls typically occur on the top or bottom step if blurred.

(LifeEase, 2003)
Glare Recovery and Night Vision
Impact of Visual Changes on Work

- Inspecting goods
- Tripping over small objects
- Seeing warnings
- Judging stair depth
- Reading manuals
Visual Perception

Decreased motion sense

Older adults perceive position of other cars as less advanced (slower)

- More involved in L turn accidents (oncoming car farther away)
- Fewer backend collisions (give more space-think car moving slower)
Changes in Driving

Changes

• Slower braking
• Slower to signal
• Difficulty anticipating other cars or pedestrians
• Slower response to rapidly changing environments
Ergonomic Recommendations
Reduce Forces and Loads Lifted

Lift Assists
Pallet lift that automatically adjusts for weight
Use Mechanical Assists

• Mechanical Assist for Lifting
  • Use the Cranes!!!!!
  • Pallet jacks
  • Dolly’s
Do not carry!!
Push instead of carry.
Break Down the Load

• Take only what you need

• Take smaller loads - garbage
Work at Waist Height
Store Items at Waist Height

Safe vertical zone: Knuckle to shoulder

Store:
- no higher than shoulder height of shortest person,
- no lower than knuckle of tallest person.
Reduce Static Loads

Static, heavy load at shoulder height
Reduce Static Loads

- Tool support systems reduce fatigue
Reduce Static Loads

Arm support systems

5% MVC creates muscle fatigue within 20-25 minutes continuously. (Bernard, 2006)
Reduce Loads
Policies and Best Practices

Examples:
- Use cranes for lifting loads >20 lbs
- Team Lifting Policy!!!
- Decrease maximum lifts for older workers by 20%
- Schedule regularly spaced pause breaks
Reduce Fatigue from Prolonged Standing

- Anti-fatigue mats
- Rail or stool for foot
- Stretch reminders
Reduce Repetitive Bending

Position at Waist Height
Get off the floor!
Reduce Repetitive Bending

And use good body mechanics

Re-position Part
Reduce Repetitive Reaching

No reaching above shoulder height!
Good Hand and Tool Use
Protect Hands
Minimize Forceful Grasp
Reduce Resistance on Controls/Triggers
Ergonomic Tools
Power and Good Design

Decrease loads on thumb joints!!
Decrease Vibration Exposures
Vision Promote Contrast!

Add contrast strips to edges of stairs/ use rails

(LifeEase, 2003)
Vision: *Reduce Glare*

- Carpet replaced vinyl
- Handrails added

Contrast for Handrails

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Carpet added

Carpet replaced vinyl and handrails added

(LifeEase, 2003)
Vision: Increase Illumination

A 60yo needs 2-3 X more light than 20yo

Highest fc ranges
> 100 fc for offices
Light-colored walls

(Fisk et al, 2004)
Vision: *Larger signage*

Use large letters for signage

Contrast between signs/symbols and background
Reducing Fall Risk

- Minimize time on ladders
- Secure ladders
- Install skid-resistant surfaces to flooring, stair treads
- Ergo mats and carpets -
  - Consider the thickness of mats
  - Industrial carpet does not increase postural sway
- Mark uneven surfaces
- Install Rails/Grab Bars
Reducing Fall Risk

- Consistent step heights:
- A difference of 1” in step height increases risk of falls (should be within 3/8”). We get used to a height, trick nervous system and fall.
- Adequate Lighting
- Color differentiation
- Good housekeeping
Driving Accommodations

- Limit driving at night or low light
- Provide wide area for maneuvering
- Improve size and contrast of signage outside cab
- Decrease reach distances by 20%
Driving

Forklift Safety
- Less load if visibility impaired
- Larger mirrors
- Clearly labeled controls
- Add extra step to enter cab
- High contrast colors on controls
- Periodic Retraining

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Chronic Conditions..

• Cold hands/derm
  • Gloves
  • Spot warmth

• Swelling in legs
  • Sit with legs up at lunch
  • Good shoes with support/padding

• Medications

Diabetes, Heart Disease, Arthritis
Health Promotion!!

Good News

www.bbsrc.ac.uk/life/musclemania/1.html
Case Mary: Office/Library Worker

61 yo
Cervical Herniation
Arthritis
Case Mary: Office/Library Worker
Let’s Capitalize on experience while maintaining safety

- Promote early reporting
- Modify jobs proactively
- Update skills - only 50% retrain older workers
- Develop work teams for knowledge transfer, mentoring
- Promote open communication
Conclusion

“There are great rewards to retaining older workers—if we can keep them safe and healthy,”

“the consequences of not doing this will be significant, but the benefits for doing it will be enormous.”
References


References


For further information and references:

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