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Ohio Safety Congress & Expo



#255 – Ergonomics to retain and manage your aging work force

Diana Schwerha, Ph.D.

Thursday, March 31, 2011
2:15 to 3:15 p.m.

Ohio | Part of the **Western** Reserve

Ergonomics to retain and manage your aging work force

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OHIO BWC Presentation
Thursday March 31, 2011
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Outline

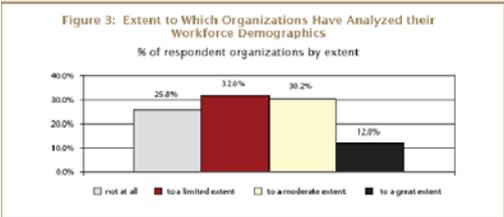
- Demographics
- Normal Aging Changes
- High Opportunity Areas
- Intervening: training and modifications

Aging in the news

- SOEH Conference, DC, 2009
- Report of the Taskforce on the Aging of the American Workforce, 2008
- White House Conference on Aging, 2005
- Tracks at safety, IH, and Ergo conferences
- In Ohio, Senior Civic Engagement Council, Employment Committee
- Academic Centers across the country

It's out there, but companies are ignoring it

Figure 3: Extent to Which Organizations Have Analyzed their Workforce Demographics
% of respondent organizations by extent



Extent	% of respondent organizations
not at all	25.8%
to a limited extent	32.6%
to an moderate extent	30.2%
to a great extent	12.8%

Boston College, National Study Report, 2007

What does this mean to your company?

What makes a worker "older"

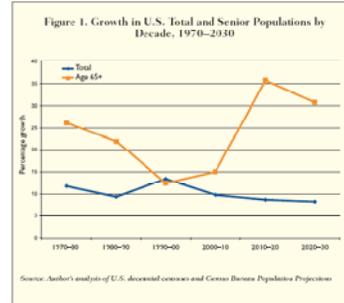
- Age?
- Experience?
- Attitude?

When will older workers be the norm?

Demographics about our workforce

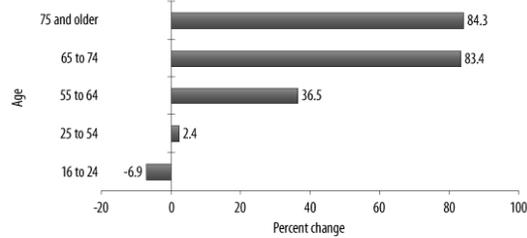
- About 80 million Baby Boomers
- Born between 1946-1964
- They start to turn 65 years old in 2011
- Your company?

Total and Senior Population



Frey, The Brookings Institution, 2007

Projected percentage change in labor force by age, 2006-2016



Issues: Economy, Downsizing with Selective Labor Shortages

- ¾ of Boomers see work as part of retirement
- Despite economy, the Employment Policy Foundation reports that there will be a projected shortage of 6 million qualified workers by 2012 and that these shortages will continue to increase through the first three decades of the 21st century

Challenge: directing workers to needed areas in jobs that are safe and fun for them

Why aging and ergonomics?

- Overexertion injuries (pushing, pulling, lifting, holding) are the leading cause of occupational injuries
- In 2006, the direct costs for overexertion injuries was \$12.4 B to businesses
- Overexertion injuries constituted 25.7% of all injuries

Good Ergonomics is Good Economics

Source: Liberty Mutual Research Institute

Aging Workers and Injuries

Chart 1. Percent of injuries and illnesses with days away from work by age of worker, 2003

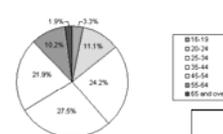
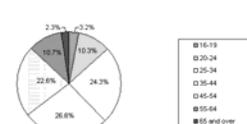
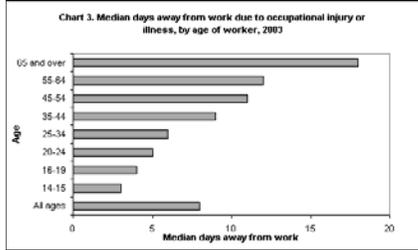


Chart 2. Percent of hours worked by age, 2003



<http://www.bls.gov/opub/cwc/sh20050713ch01.htm>

Median Number of Days Away from Work



<http://www.bls.gov/opub/cwc/sh20050713ch01.htm>

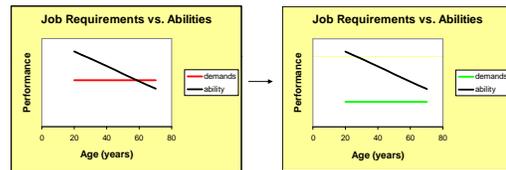
Understand normal age-related changes

In what areas do normal age-related changes occur?

- Physical
 - Vision, hearing, work physiology, lifting, cold stress, reaction time, falls, fatigue
- Cognitive
 - Stress, working memory, distraction, divided attention

Variability

Design tasks to match demands with worker abilities



Vision

- Many people over 40, can't bring close objects into focus (safety glasses)
- Adapting to the dark is more difficult
- Peripheral vision decreases
- Decreased transmission of light
- Increased problems with glare



Consider older adults' vision as noisier—we must boost the signal

- Increase the size of the font
- Ensure enough contrast
- Use sans serif font
- Allow users to change font size with browser software

Avoid blue on grey

Improve individuals' interaction with computer interfaces

- Guidelines for designing web pages for older adults:
- Making your Website Senior Friendly
- Font size, contrast, organization, mental models, menu levels
- <http://www.nlm.nih.gov/pubs/staffpubs/od/ocp/agingchecklist.html>

Safety glasses



Clear Bifocal Safety Glasses

<http://www.amazon.com/Bifocal-Safety-Glasses-Yellow-Lens/dp/B000CCD8VY>
<http://www.phillips-safety.com/Bifocal-Safety-Glasses/Index.htm>

Glare Film



<http://www.tropicint.net/residential.html>
<http://www.hotspottinting.com/resbenefits.htm>

Text Magnifiers



<http://www.aisquared.com/index.cfm>

Hearing

- Age-related and noise induced
- Men often lose ability to hear high frequency sounds (above 4000 Hz)
- Noise induced hearing loss increases the problem
- Compressed speech may be difficult
- Lower signal to noise ratio

Increase perception and understanding of auditory signals

- Use speech compressed at no more than 20%
- Allow users to change volume
- Use frequencies below 4000 Hz
- For warning signals, use 500 to 2000 Hz
- Use redundant signals
- Minimize background noise (or at least understand where it is and how it affects performance)

Work scheduling

- Determine if flexible work schedules are possible
- See what proportion of workers would stay if given options
- Job Rotation
- Watch for changing shifts (difficult as we age!)



Movement

- Muscle mass decreases start around age 20 and continue throughout one's lifetime
- Reaction times slow
- Slips and falls can be a bigger risk for older workers
- Workers may adopt compensatory actions

Losses in muscle mass and strength can be partially overcome or delayed by regular weight-bearing exercise

Lower Back Pain

- Can affect up to 80% of people during their lifetime
- Back injuries have high recurrence rates ranging from 40-70%
- Back injuries can result for a variety of reasons

Rely on good design for lifting tasks

- Heavy lifting jobs should be evaluated for all ages of workers
- Mechanical assists should be used to help all ages of workers
- If you can't minimize weight, make it too heavy to lift
- Ask suppliers for boxes with better coupling
- Don't give the heavy lifting to the younger people!!!!
 - Risk of injury with inexperience
 - Younger workers today are tomorrow's older workers

Hand Tools and Grip Strength

- Preventive maintenance will reduce forces needed
- Changes in grip strength could be a sign of an injury
- Job rotation so that different muscle groups are used

Identify risks for slips, trips, and falls

- Locate transition areas (going from light to dark, or from dry to wet) involve higher risks for falls
- Because workers change their gait according to environmental conditions, warning signs can be valuable
- Investigate safety footwear (tread and additional friction devices)
- Investigate alternate walkways

Aerobic capacity

- Older workers tend to lose aerobic capacity before strength
- Aging workers may have complications due to multiple conditions (obesity, high blood pressure)
- Especially important with heat stress
- Wellness programs may help

Job Design and Fatigue

- In our preliminary research findings, at least half respondents stated that they are both mentally and physically tired by the end of the day
- Excess fatigue could lead to burnout
- Burnout is a retention issue

Memory/Attention

- Working memory has been shown to be affected by age
- Working memory decreases don't usually start until after 65
- Age-related decreases in performance have been shown in studies for tasks that require divided attention or contain distractions
- Watch out for side effects of medication

Memory and Attention

- Memory decreases can be offset by cognitive aids (e.g. checklists, reminders)
- Use recognition, not recall
- Divided attention tasks should be studied and eliminated if possible
- Possible distractions should be investigated, eliminated

Automated Responses

- Older adults may have difficulty inhibiting previous responses
- Could lead to negative transfer of training
- Especially important if controls are changed



Training

Gain awareness by providing training

- Work with age-diverse team to develop training program to raise awareness about normal aging changes
- Emphasize that the goal of the program is awareness and improvement
- Explain normal aging/abilities and not disease

Today's younger workers are tomorrow's older workers

What are the aging issues?

- Obsolete technology or obsolete personnel?
- Aging workers are more expensive
- Held values and opinions about others
- Condescension
- Consistency of personality traits
- Stereotypes about older and younger workers

Adult learning styles

- Keep groups small
- Utilize clear presentations/format
- Allow time for working in teams
- Allow time for problem solving
- Include participatory approach (no lectures) and exercises
- Match instructional technique to type of material presented

Utilize innovative training strategies to build awareness

- Use simulations to help others understand magnitude of changes
- Simulations can be cognitive/organizational in nature
 - Simulate new employee experience by creating scenario and trying to solve problem without all the necessary information
 - Use simulations to convey safety culture
- Encourage young to understand older worker experiences and vice versa

NIOSH Hearing Simulator



<http://www.cdc.gov/niosh/mining/products/product47.htm>

Opportunities for training/job enrichment

- Be sure that older workers get the same opportunities for training
- Do not automatically conclude that an older worker would not be interested in a certain type of training
- Allow timing of training to correspond with flexible schedules

Conduct task analyses to identify areas needing improvement

(and remedy them!)



Establish teams to identify priority areas

- Develop age-diverse teams with representation from all levels of staffing
- Have teams prioritize projects
- Allow teams to solve problems with assistance when needed
- Empower, empower, empower



Prioritize areas

- Establish areas
- Identify tasks that could be sensitive to normal age-related changes
- Brainstorm ways that task could be improved
- Analyze tasks that have combinations of challenges
 - Signage, reaction times, lighting, controls
- Examine recent task changes



Benefit from an age-diverse workforce

- Know your employees
- Understand normal age-related changes
- Raise awareness
 - Get buy-in from top management
 - Gain the trust of your employees
 - Create age-diverse participatory teams to tackle problems
- Conduct task analyses to identify and remedy areas needing improvement



Understand why employees stay

- Financial security
- To stay healthy
- Because work is enjoyable
- To maintain social relationships
- Insurance
- Work provides a sense of personal accomplishment

To keep your older workers understand what they want from work



Questions?

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