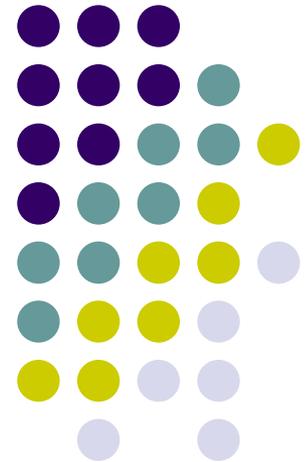


# Ergonomics and the Aging Workforce: Ergonomics to Retain and Manage Your Aging Workforce

**Diana Schwerha, PhD**  
**Russ College of Engineering and Technology**  
**Ohio University**

**Lake County Safety Council**  
**February 17, 2017**



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**Create**  
**for Good.**



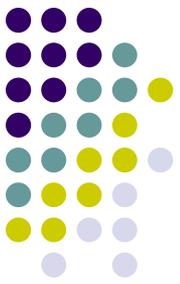
Things are changing

# Today's Talk

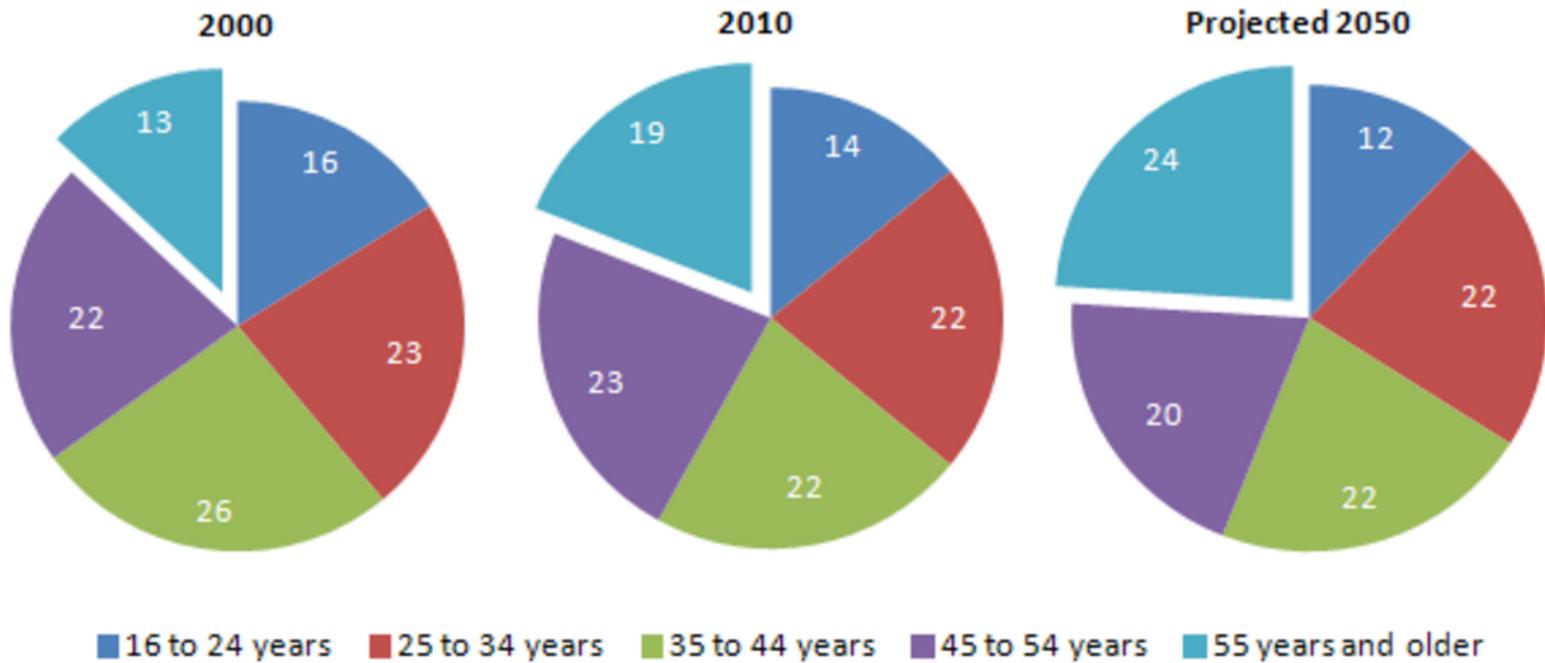


- Demographics
- Continuum of worker abilities
- Knowledge transfer
- Next Steps

# Demographics



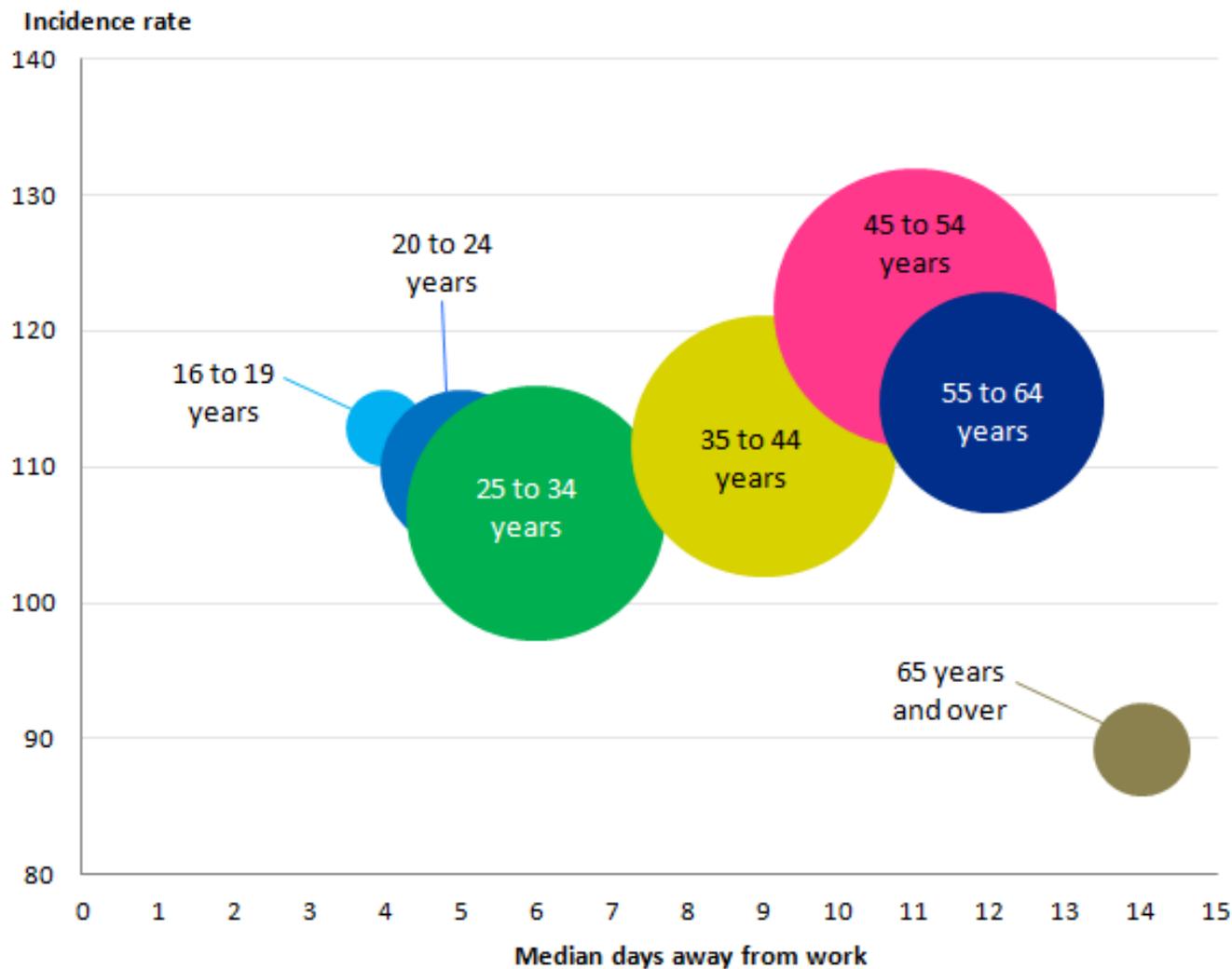
Percent of labor force by age, 2000, 2010, and projected 2050



Source: U.S. Bureau of Labor Statistics.

# Incidence rate and median days away from work for nonfatal occupational injuries and illnesses involving days away from work, by age, 2012

Size of bubble represents total number of incidents in 2012



Note: The incidence rate is the number of incidents per 10,000 full-time workers.

Source: U.S. Bureau of Labor Statistics.





# At your workplace

- Workers may be likely to work longer
- Type of work and retirement benefits are significant factors for when a person retires
- Older workers may change jobs, so you may have a new employee who is older
- Because older workers tend to be off more when injured, prevention is key

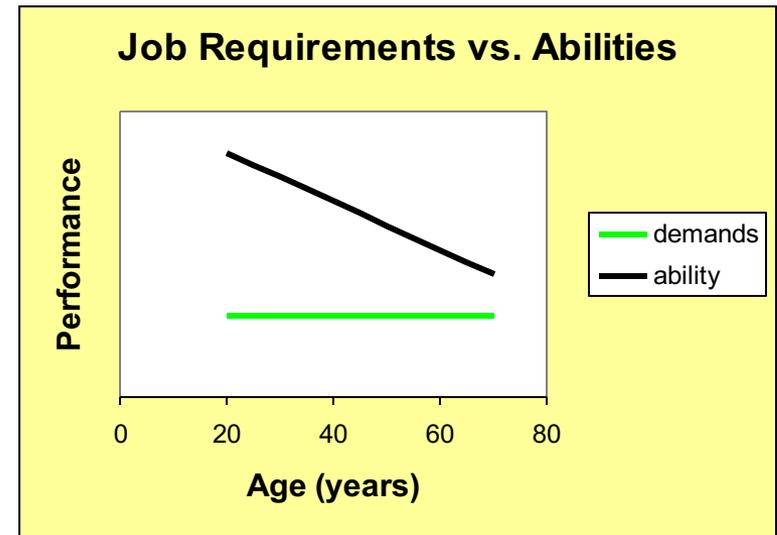
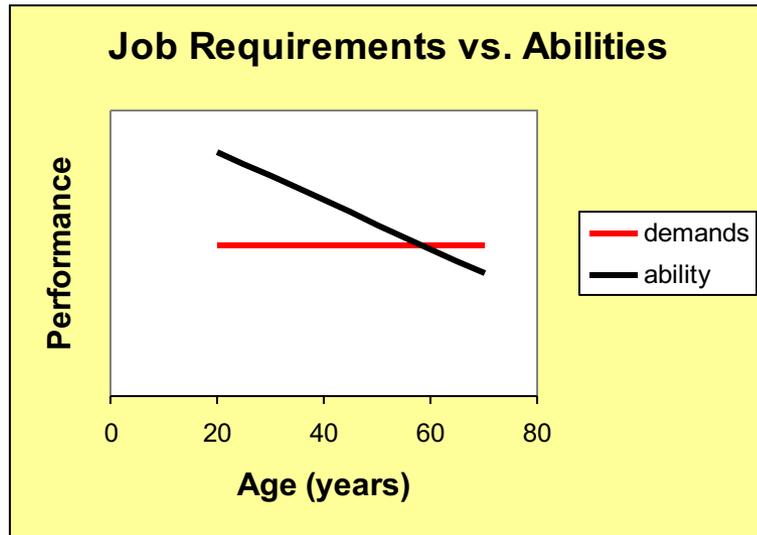
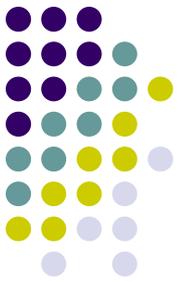
# In what areas do normal age-related changes occur?



- Physical
  - Vision, hearing, work physiology, lifting, cold stress, reaction time, falls
- 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



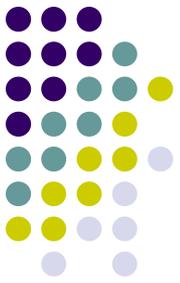
# Consider older adults' vision as noisier—we must boost the signal



- 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>

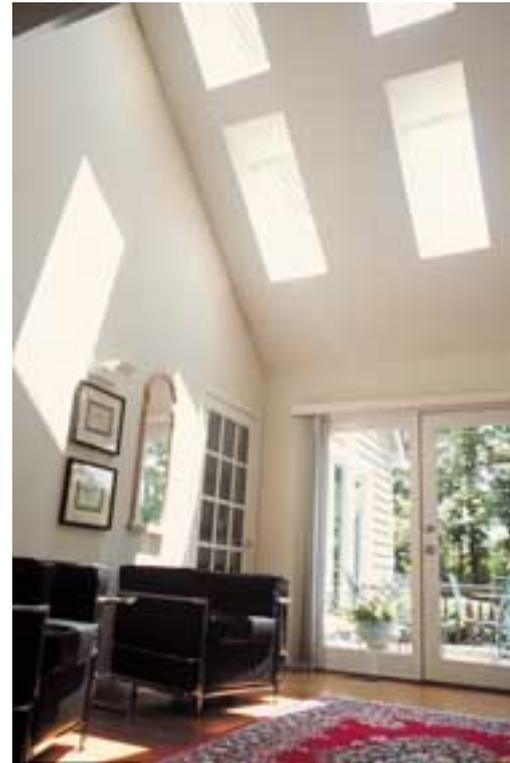
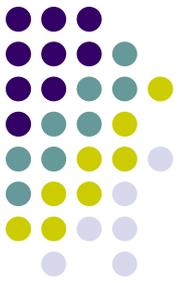
# Safety glasses



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

# Text Magnifiers or increase font size

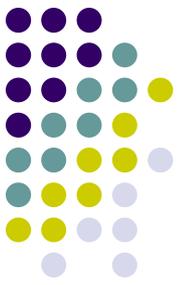
A screenshot of a web browser window. The address bar shows the URL <https://www.nlm.nih.gov/pubs/staffpubs/od/ocpl/agingchecklist.html> and a magnification level of 300%. The main content of the page is the title "Making Your Web Site Senior Friendly" in a large, dark blue font, with the subtitle "(Also in PDF)" below it. The browser's taskbar at the bottom shows various application icons and the system tray with the time 10:31 AM and date 2/16/2017.

# Hearing



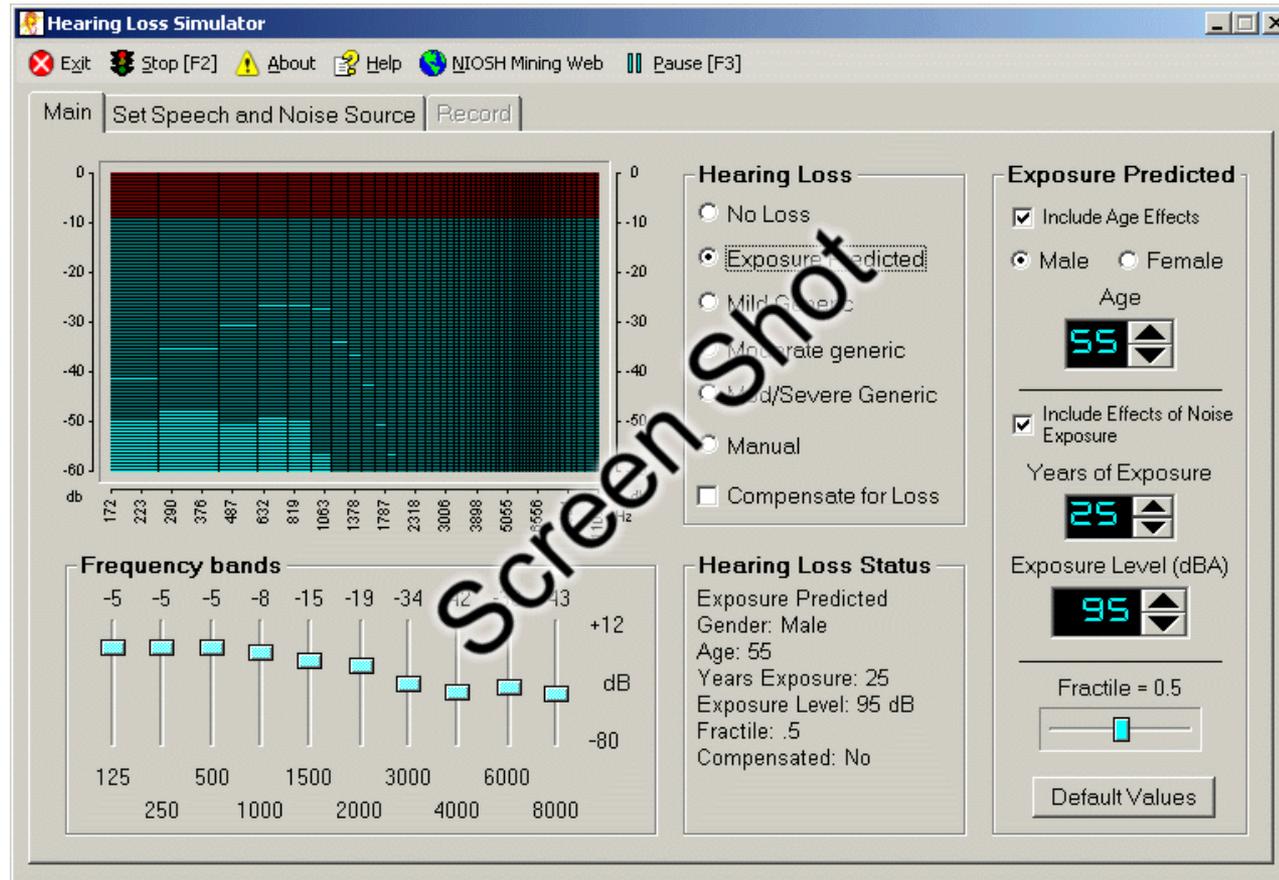
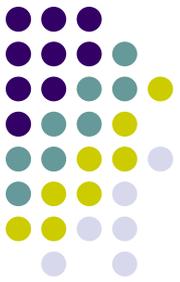
- Age-related and noise induced
- Men often lose ability to hear high frequency sounds (above 4000 Hz)
- Noise induced hearing loss increases the problem
- Additional challenges with background noise

# Increase perception and understanding of auditory signals



- 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)

# NIOSH Hearing Simulator



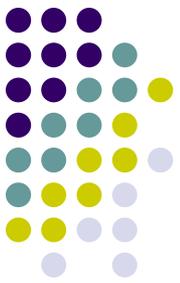
<http://www.cdc.gov/niosh/mining/products/product47.htm>

# 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!)

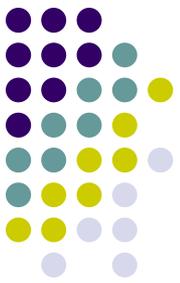




# Movement

- 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

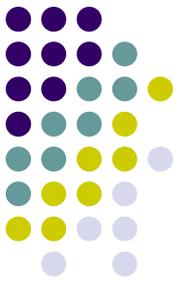
Losses in muscle mass and strength can be partially overcome or delayed by regular weight-bearing exercise



# Lower Back Pain

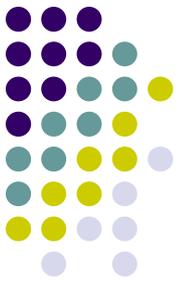
- Can affect up to 80% of people during their lifetime
- Back injuries have high recurrence rates ranging from 40-70%
- Back injuries can result for a variety of reasons
- Back injuries are expensive and have a high social cost (but you already know this!)

# Rely on good design for lifting tasks



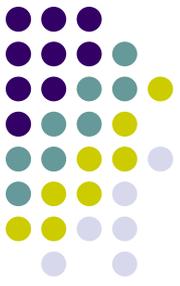
- Heavy lifting jobs should be evaluated for all ages of workers
- Mechanical assists should be used to help all ages of workers
- If you can't minimize weight, make it too heavy to lift
- Ask suppliers for boxes with better coupling
- Don't give the heavy lifting to the younger people!!!!
  - Risk of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

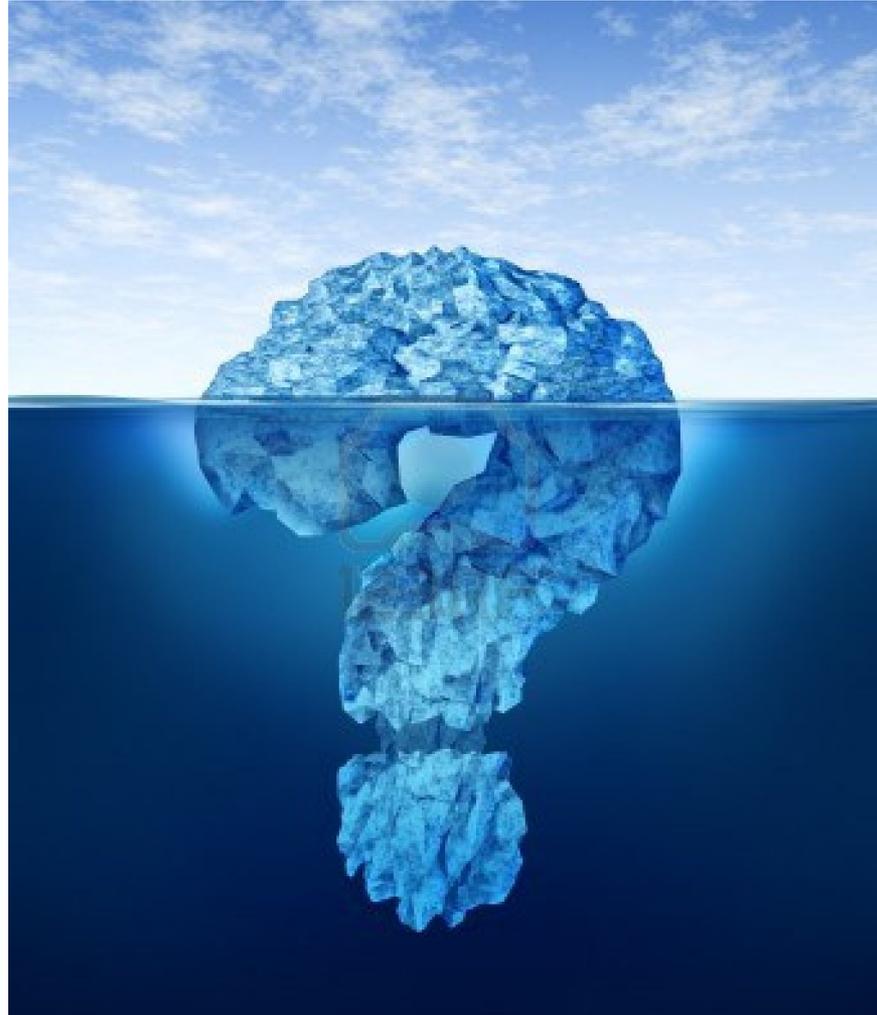
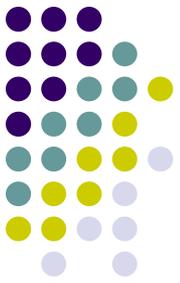
- Older workers tend to lose aerobic capacity before strength
- Aging workers may have complications due to multiple conditions (obesity, high blood pressure)
- Especially important with heat stress
- Wellness programs may help

# 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

# Knowledge Transfer



# Most companies are at risk for lack of good programs to ensure knowledge transfer

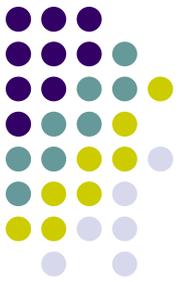


- Have you done a knowledge transfer audit?
- Do you know where your gaps are?
- What types of knowledge transfer programs do you have in place?
  - Good work procedures, documentation?
  - Mentoring?
  - Or none, all knowledge is tribal...

# Next Steps: Things to Consider



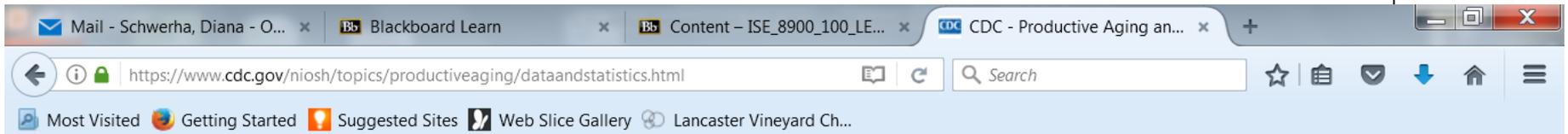
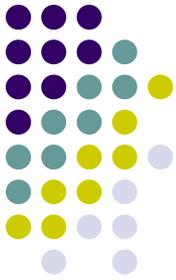
- Injury and Near Miss Audit
  - Where are your injuries or near misses occurring?
  - In which age groups?
  - In which tenure?
- Safety Involvement
  - Safety teams, Age-diverse? Experience diverse?
- Consider the work environment holistically
  - Safety integrated with process improvement
  - Team involvement



# Things to consider

- Where will you have individuals retiring?
  - Succession planning audit?
- Where are your gaps in knowledge transfer?
  - Utilize process improvement techniques to get age-diverse groups working together (e.g., lean tools)
- Try new things and reward effort!

# Resources: NIOSH



## The National Institute for Occupational Safety and Health (NIOSH)

Workplace Safety and Health Topics

Productive Aging and Work

What is Productive Aging?

What is NCPAW?

Research Goals

Safety and Health Outcomes

Tools and Resources

Current Research

Data and Statistics

Promoting a productive workplace through safety and health research



[NIOSH](#) > [Workplace Safety and Health Topics](#) > [Productive Aging and Work](#)

## PRODUCTIVE AGING AND WORK



# Resources: Boston Center for Aging and Work



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www.bc.edu/research/agingandwork/archive\_pubs/QI10.html

Most Visited Getting Started Suggested Sites Web Slice Gallery Lancaster Vineyard Ch...

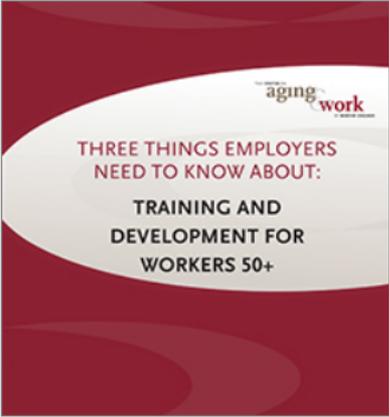
bc home > research > aging & work home > publications archive > quick insight 10

## Center Publication

### Three Things Employers Need To Know About: Training and Development For Workers 50+ — Quick Insight 10

**EMPLOYERS CAN PROVIDE EMPLOYEES WITH TRAINING AND DEVELOPMENT OPPORTUNITIES VIA A WIDE RANGE OF POLICIES AND PRACTICES, INCLUDING ON-THE-JOB TRAINING, JOB TRANSFERS AND ROTATIONS, COACHING AND MENTORING, AND PLANNING.**

*based on an analysis by the 2015 Talent Management Study*

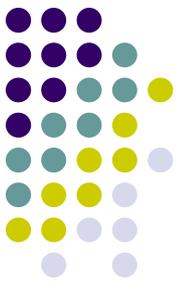


1. Why should employers care about training and development for older workers (or in fact for any workers)?
2. Do some industry groups provide more training and development opportunities for older workers?
3. What is the biggest challenge in training and development for older workers?

» [Download the Quick Insight: Three Things Employers Need To Know About: Training and Development For Workers 50+](#)

» [View All Center Publications](#)

10:25 AM  
2/16/2017



# Resources: Ohio University Training Modules

- Aging and Ergonomics Online training
  - Will be available Summer 2017
  - Looking for reviewers
  - Will have assessments and hoping to be able to give CEU
  - Contact me at [schwerha@ohio.edu](mailto:schwerha@ohio.edu) for more information
- Integrating Safety with Process Improvement
  - Available after June 1, 2017

# Questions?

- Diana J. Schwerha, PhD
- [schwerha@ohio.edu](mailto:schwerha@ohio.edu)
- 740.593.1577



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