Workplace Ergonomics and Health for the Aging Workforce

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Presentation Overview

- Workforce data
- Data on workplace injuries by age
- Employer benefits/concerns
- Understanding changes that occur with the aging process
- Workplace safety/ergonomic recommendations to prevent injuries

Workforce Data

The significance of the aging workforce
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**Data on the Aging Workforce**

- Aging workforce is defined as those individuals aged 55 and higher
  - This population constituted 19.5% of the workforce in 2010
  - Up from 12% in 2003
  - Predicted to be 25.2% in 2020

- 10,000 baby boomers turn 65 every day
  - ½ will work into their 70’s
  - 2/3 will continue to work beyond 65 years of age

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**Data on the Aging Workforce**

- BLS spotlight on statistics (as of 2010)
  - Number of 55+ workers in 1990: 15 million
  - Number of 55+ workers in 2000: 18.7 million
  - Number of 55+ workers in 2010: 30 million (9.1 million more than the 16-24 y.o. group)
  - Predicted 55+ workers in 2020: 41.4 million

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**More BLS stats**

- From 2006 to 2016:
  - 16-24 y.o. expected to decline
  - 25-54 y.o. expected to rise slightly
  - 55-64 y.o. expected to increase by 36.5%
  - 65-74+ y.o. expected to increase by 80%
Change in median age - impact of the baby boom generation

- 1962 median age: 40.5
- 1978 median age: 34.8
- 2008 median age: 40.7
- 2010 median age: 41.7
- Predicted age in 2020: 42.8

Since the mid-1990s there has been a dramatic shift in the part-time versus full-time status of the older workforce.

In recent years a larger share of people 65 and older is staying in or returning to the labor force.


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AARP Workforce Assessment Tool

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**POSTPONED RETIREMENT**

Surveys - reasons for later retirements:
- Stay active and engaged in professional field
- Increase in life expectancy
- Current financial concerns
- Increasing retirement funds (401K)
- Coverage of US workers are covered by a defined pension benefit
- Need for healthcare coverage
- Increase in age to qualify for Social Security

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**Benefits**

- Lower turnover
- Less need for supervision
- Can mentor younger workers
- Increased:
  - Experience
  - Knowledge
  - Abilities
  - Workplace loyalty
  - Flexibility to meet business needs
  - Emotional maturity
  - Level of commitment/dedication
  - Organizational savvy and understanding of the workplace culture
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Employer Concerns

- Older workers skills don’t match the demand of the modern marketplace
- Disability claims
- Need for accommodations for the older workers
- Changes in productivity
- Higher paid
  - EEOC WA field office reporting an increase in age-related discrimination claims: 160 in 2002, 372 in 2011, with a peak of 414 in 2008
- Cost of health care for older workers
- Cost of WC for older workers

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US DOL Statistics

Age 64+ = lowest number of injuries
- Injuries tend to be related to repetitive use or slips/trips/falls
- Cost of injury tends to be higher
- Duration to recover = longer
Ages 25-44 = highest number of injuries
- Number of injuries makes this group the most costly

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Trends: Work-related absences following a work-related injury
Median days away from work due to occupational injury or illness, by age of worker - 2011

1. Longer durations of work absences steadily increase with age
2. The median number of lost work days after injury increases with age
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**Injury trends for workers 55+**

The most frequently injured body parts are:
- shoulders, hand, head, trunk, and knee

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**Trends cont’d**

The most common mechanism of injury causing or contributing to the injury of our aging workforce is falls.
- Older workers are twice as likely to sustain a fracture
- Fatality of falls increases with age

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**Trends cont’d**

After falls, the most common mechanism of injury: Over-exertion, and contact with an object
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**Trends cont’d**

The conditions/types of tissues that are most susceptible: most of the injuries are sprains, strains, and soft tissue injuries.

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**Trends cont’d**

- There is a higher fracture rate for those 55+ - this likely correlates with the higher fall risk.
- See an increased occurrence of multiple injuries and multiple co-morbidities.

All of these factors may contribute to delayed healing, longer recovery times, and extended episodes or duration of interventions and may also explain the longer absences and time away from work.

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**What/how injuries occur in the workplace**

Two primary mechanisms:

1. Force-related
   - The severity of the injury depends on the size, speed, and direction of the force applied

2. Cumulative trauma and exposure to ergonomic risk hazards
   - Occurs with inadequate blood supply to the working tissues
Physiological Changes on the Human Body Related to Aging

- Bones and Joints
- Weight bearing and movable joints are at the highest risk for degenerative changes
  - Higher risk of osteoporosis and osteoarthritis - this risk increases significantly over the age of 40
  - See less synovial fluid, less flexibility, and more compression on joint surfaces
  - Clinically: Loss of ROM/flexibility/strength with higher risk of fracture of the spine, hips, wrist, ankles

Impact on Work

1. Poor/awkward postures
2. Higher risk of CTD
3. Slower tissue recovery rates
4. Painful, slower movement, lower productivity
5. Higher fall risk - 1/3 of all 65+ pop. fall each year
6. Less tolerant of prolonged standing

Physiological Changes on the Human Body Related to Aging

- Functional Changes
  - Diminished muscle strength, flexibility, coordination, reflexes, balance, loss of range of motion and general deconditioning
    - Strength: 25%-30% lower at 65 years
    - Flexibility: 18-20% decrease at 65 years
    - Reaction time and speed: decreases
    - Manual dexterity and tactile feedback: motor skills deteriorate
    - Grip strength decreases: 40% by age 55
Physiological Changes on the Human Body Related to Aging

Functional Changes (cont’d)
- Higher incidence of co-morbidities may further worsen the level of function due to direct assault on tissues by specific disease states. This population also tends to take more meds – may have side effects that directly impact/impair function.

Impact on Work
1. Safety and injury risk: Falls
2. This population may need less physically demanding jobs

Ergonomics
- The goal of ergonomics is human performance
- The goal is to design tasks, jobs, activities, work areas, and environment to remove known risk factors and obstacles that impede optimum performance in order to prevent injuries, illnesses, errors, confusion, mistakes and to improve overall employee wellness and overall business performance.
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Ergonomic programs have two fundamental control measures:

Administration Solutions
- Education and training
- Job assignments and placements
- Job rotation and breaks
- Stretching programs
- Exercise, strength, conditioning and health programs
- Return-to-work strategies

Engineering Solutions
- Task Design
- Workstation Design
- Environmental Design
- Tool Design
- Manual Material Handling design
- Equipment design

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Ergonomic Accommodations
- Add anti-fatigue mats or cushioning insoles
  - Older workers found inserts more comfortable
  - Caution with using inserts + anti-fatigue matting for older individuals
- Create an environment where the majority of the work happens within the worker’s “comfort zone”
  - Reduce extremes of motion/reaches

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Comfort Zones

[Diagram of comfort zones with danger zones highlighted]
Ergonomic Accommodations

- Reduce force needed for grips
  - Power tools and spring loaded tools
  - Grip modifications
  - Ergonomic/neural joint tools
- Reduce pinch grips – convert to power grips

Ergonomic Accommodations

- Create opportunities for sit/stand work stations
- Allow for increased recovery periods
- Task and job rotation
- Consider voice/speech recognition vs. typing
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**Ergonomic Accommodations**

- Implement use of mechanical aids/mechanical lifting devices or counter-balancing systems
- Use transportation carts/dollies
- Slide objects or use conveyors vs. carry/lift
- Eliminate physical barriers
- Decreased shape/size of raw/produced materials
- Implement more rest periods/stretch breaks
- Train workers in proper body biomechanics

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**Ergonomic Accommodations**

- Reduce risks for slips/trips/falls
  - Reduce need for climbing at heights
  - Clear walkways and eliminate trip hazards/clutter
  - Mark transitions in surface elevation changes
  - Use fall protection/create fall barriers
  - Use skid resistant floor surfaces
  - Properly maintain floor surfaces
  - Use proper lighting

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Physiological Changes on the Human Body Related to Aging

- Vision
  - Loss of visual accommodation, acuity, and contrast at around 40 – see bifocal use and increased eyewear prescriptions
  - Macular degeneration and cataracts begin to appear by age 50
  - Retinal damage – diabetics
  - Loss of lateral visual field

Impact on Work

1. Poor awkward postures to accommodate, with increased muscle strain, injuries, DJD/DDD
2. Increased eye strain/dryness
3. Reduced ability to see safety warnings
4. Higher injury risk due to limited vision

Ergonomic Accommodations

- Older workers will need 2-3x more light than younger workers (up to 60% increase in light may be needed)
  - Use natural low glare/high quality light (consider LED vs. high pressure sodium lighting)
  - Brightly illuminate all walking surfaces (indoor and out)
  - Provide adequate contrast to detect contaminants, transitions, and trip hazards
  - Motion/infrared activated vs. switches
  - Add task lighting
DVA – dynamic visual acuity
- Ability to resolve details of a moving target - is more closely associated with accident involvement than static acuity
- Starts to deteriorate around age 45
- Nighttime legibility distances of highway signs for drivers over 60 were 60-75% of the legibility for younger drivers
- Tasks requiring visual acuity of highly mobile information or controls may be better served by younger workers, however, the following accommodations will help:
  - Keep controls well lit
  - Decrease visual clutter
  - Increase illumination without creating glare

Ergonomic Accommodations
- Increase font size
- Older people adapt to light and dark more slowly – keep similar levels of light in various work areas
- Older people tend toward a restricted field of view and are less likely to see signs unless they are in direct line of sight – place critical signs at eye level
- Improve label instructions - simplify and be clear
- Safety signs/symbols should be bright, with contrasting colors
  - Avoid shades of blue, blue/green or blue on black
Ergonomic Accommodations
- Provide audio cues as well as visual cues for alarms, machines, etc.
- Use bright or contrasting colors for floor height transitions and use low profile thresholds
- Presbyopia
  - Consider ANSI safety glasses with bifocal lenses
  - Encourage regular eye exams

Physiological Changes on the Human Body Related to Aging
> Metabolic Changes – higher incidence of metabolic related co-morbidities and their associated diseases
  - Clinically: muscle weakness, fatigue, dizziness, side effects due to medications
  - Higher risk of type 2 diabetes, heart disease, stroke – 40% of adults age 40-74 have pre-diabetes signs
  - Higher body fat/BMI and associated health effects

Impact on Work
Higher injury rates and slower recovery time
1. Fatigue, weakness, MSD increase
2. Higher fall risk
3. Delayed healing post-injury
4. More lost work days post-injury
5. Age-related diseases/co-morbidity rates increase
Physiological Changes on the Human Body Related to Aging

- Vascular changes
  - Affects endurance/aerobic capacity
  - Increased CTD due to decreased blood flow
  - Older workers have to work harder and accomplish less
  - Arteries stiffen = higher blood pressure
  - Diminished ability to regulate HR = diminished peripheral blood flow
    - Oxygen exchange – 40% lower at 65 years of age
    - Respiratory system – 25% less at 65 years, 50% less at 70 years
    - Cardiovascular system – 15% to 20% less at 65 years

Impact on Work

- Diminished recovery time with workloads and post-injury
  1. Deconditioned, poor activity tolerance, slower recovery rate, fatigue
  2. Higher injury, slower recovery

Ergonomic Accommodations

- Same as previously stated
- Allow for flexibility of schedules, tasks, etc.
- Additionally
  - Allow for longer recovery times vs. work cycles
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Physiological Changes on the Human Body Related to Aging

- Dehydration
  - As we age, we lose a significant amount of water from our tissues
  - Affects tissue elasticity and chemistry
  - Percent change in body water composition:
    - Newborn: 90%
    - Young Adult: 70%
    - Elderly: 50-60%

  Clinically: light-headedness, dizziness, muscle weakness, loss of attention, fatigue

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Impact on Work

1. Slower musculoskeletal recovery times, with higher injury risk
2. Use of PPE or extreme heat can worsen dehydration
3. Reduced productivity

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Accommodations

- Encourage water intake
  - Personal water bottles
  - Strategically placed water coolers
  - Provide/encourage electrolyte supplements
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**Additional Concerns**

- Hearing
  - Loss of high level frequencies
  - Trouble discriminating in noisy environment
- Psycho-social history
  - Loss of spouse
  - Depression
  - Financial concerns
- Cognitive changes

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**Ergonomic Accommodations**

- Use visual as well as auditory cues
- Speak directly to workers – face to face
- ABCs of sound – absorb, block, control

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**Ergonomic Accommodations**

- Minimize complexity of tasks.
- Consider automating certain processes.
- Lengthen time requirements between steps in tasks.
- Reduce need for multitasking.
- Increase decision-making time.
- Eliminate clutter on computer screens and work areas.
- Take advantage of experience.
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**Ergonomic Accommodations**
- Use frequent and short hands-on refreshers.
- Provide separate training classes incorporating different learning techniques for older and younger workers.
- Provide opportunities to practice tasks.
- Provide no more than 3 critical issues to be learned per training session.
- Highlight items that must be learned at the beginning, middle and end of session.

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**Other considerations**
- Pre-employment screening
- Wellness programs
- Workplace exercises

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**Summary**
- Assess workplace accessibility
- Assess health and demographics of current and predicted workforce
- Conduct Job Analysis
- Make Accommodations for all workers – reduces stigma
- Ergonomic Design
- Job Descriptions
- Assistive Technology
- Job Accommodation
- Training Initiatives - skills
- Wellness Programs and Health Promotion
Questions?

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