Aging Workforce:
What Workers’ Compensation and Occupational Health Professionals Need to Know

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Let’s Talk About:

- Physical Changes
- Muscle Strength
- Risks
- Costs
- Solutions
Aging Workforce Trends
Population & Workforce Trends

• Why are more people working longer? Past “retirement”?  
  – Personal financial security: increases in cost of living, shrinking pensions, lack of retirement savings  
  – Economy: concerns over stability of Medicare & Social Security
Population & Workforce Trends

- Well documented that U.S. population trends indicate greater a proportion of workforce over age 55
- Percent population over 65 years highest ever in history, reflecting baby boomers
- Administration on Aging reports the older population (65+) numbered 40 Million in 2009
  - 12% of the U.S. population
  - In 2020, expected to grow to 72M, 25% of our population
- Median age of our labor force is 41 years of age, increasing incrementally
- One fifth of men in workforce are veterans, median age of veterans is 50, non-vets is 39

Four Key Factors that Increase the Costs of All Insurance

• Aging workforce

• Loss of muscle mass
  – Sarcopenia

• Loss of muscle strength
  – Dynapenia

• Obesity

*If you can positively affect these factors, you can control medical, disability and injury costs!*
Impact of Muscle Mass, Strength and Fat Weight on Body Weight

Ref: Tom Gilliam PhD: IPCS
The Aging Workforce

- Older workers have lower incidence rate of injury
  - Recover more slowly from injuries and illnesses resulting in delays in returning to work
  - More costly claims

- Longer rehab durations

- Benefit of aging workers:
  - Pride, work ethic
  - Knowledgeable
Aging Workforce Recovery Trends

• Research indicates recovery times following injury are longer with this age group:
• Median number of lost work days after injury increases with age:

Ref: U.S. and state government researchers (CDC, BLS and several state agencies) 2009-2013
Ref: National Institute for Occupational Safety and Health, Morbidity & Mortality Weekly Report
Aging Workforce How They Get Injured

• Research indicates the most common injury type for this workforce group is......

  FALLS!

• Balance deficits, muscle weakness, vision loss, side effects from medicine
Aging Workforce: What Gets Injured

- Research trends indicate the most frequent injuries by body part and condition are:
- Most frequently injured body parts:
  - Ankles, Wrists, Arms, Hips
- Injury Types:
  - Fractures, strain, sprain, soft tissue injuries
  - Women more likely than men to sustain fractures of wrists, forearms in older population
  - Higher incidence of multiple injuries, co-morbidities

Ref: U.S. and state government researchers (CDC, BLS and several state agencies) 2009
Age-Related Changes & Impact on Work
Age Related Changes in Human Body

With regards to working & deficits a Physical Therapist can assist with, primary areas of concerns are:

- Bones & Joints
- Eyes
- Vascular Changes
- Dehydration
- Functional Abilities

Ref: National Institute of Health
MedlinePlus: Winter 2007 Issue: Volume 2 Number 1 Pages 10 - 13
The Aging Bones & Joints

Weight bearing and movable joints at highest risk for age-related degenerative changes

- Osteoporosis
  - Risk factor increases over age 40
  - Higher fracture risk: Spine, Hip, Wrists
- Arthritis
  - Loss of ROM, flexibility, strength

Age Related Vascular System Changes

- Arteries stiffen, higher blood pressure
- Diminished ability to regulate heart rate; diminished peripheral blood flow
  - Oxygen exchange – 40% lower at 65 yrs
  - Respiratory system – 25 % less at 65 yrs, 50% less at 70 yrs
  - Cardiovascular system – 15-20 % less at 65 yrs
Age Related Dehydration

- **Percent body water composition:**
  - Newborn: 90%
  - Young adult: 70%
  - Elderly person: 50-60%
- Leads to light-headedness, dizziness, muscle weakness, loss of attention, fatigue
- Use of PPE or extreme heat can worsen

Age Related Vision Changes

- Poor/awkward postures to accommodate, increased muscle strain, injuries, degenerative joint/discs diseases
- Increased eye strain/dryness/headaches
- Reduced ability to see safety warnings
- Higher injury risk due to limited vision
Sarcopenia (Higher Fall Risk)

Sarcopenia:
- From Greek language, meaning “poverty of flesh”
- Defined as age related loss in muscle size and strength
- Decrease in lean muscle mass often accompanied by increase in fat, body weight may remain unchanged
- Direct correlation to muscle loss (sarcopenia), loss of strength and an increase for fall risk
- Dr. Turpelek, Cleveland clinic: strength: 4th vital sign

• Loss of strength due to loss of 30% of muscle mass from age 30 to 65, by age 80, loss of 50% of muscle mass
• Contributes to loss of functionality
• Can be reversed with physical activity/strength training

Ref: Industrial Medicine and Acute Musculoskeletal Rehabilitation: Acute Musculoskeletal Injuries in Aging Workforce, 2007
Low Strength Associated with Disease

Increased Risk For:

- Metabolic Syndrome
- Type II Diabetes
- Cardiovascular Disease
- Mortality
Body Weight Accelerated Strength Loss

Is the Loss of Muscle Mass Being Accelerated with Weight Gain?

Loss of Muscle

Accelerated with weight gain, lack of physical activity

Normal Aging

30  55  65

Ref: Why Decreased Muscle Mass is a Risk Factor: A Costly Risk Factor That Can Be Reversed (White paper) Tom Gilliam PhD: IPCS and Move It or Lose It, 2013, with permission
Age Related Functional Changes

- Diminished muscle strength, flexibility coordination, reflexes, balance, loss of range of motion, general de-conditioning
  - Strength - 25-30 % lower at 60 yrs
  - Flexibility - 18-20 % decrease at 65 yrs
  - Reaction time & speed – decreases
  - Manual dexterity & tactile feedback – motor skills deteriorate
- Co-morbidities with pathophysiological affects: diabetes, heart disease, circulatory problems, nervous system etc.
- Medications: dizziness etc.

- Impact on Work:
  - Safety & injury risk: falls!
  - Less physically demanding jobs

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Body Weight Strength Relationship

• Suggested: a worker’s strength must be proportionate to the worker’s body weight to allow the worker to safely perform the essential functions of the job
• As body weight increases so does strength up to a BMI of about 37.5 (severe obesity category of 35 to 39.9)
• For BMI’s greater than 50: negative relationship between strength and weight

Ref- Why Decreased Muscle Mass is a Risk Factor: *A Costly Risk Factor That Can Be Reversed (White paper)*  Tom Gilliam PhD: IPCS and Move It or Lose It, 2013, with permission
Aging: Impact on Work

- Higher fall risk
- Painful, slower movement
- Lower productivity
- Poor Postures
- Higher risk for CTDs,
- Slower tissue recovery rates
- De-conditioned, poor activity tolerance, fatigue

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Age Drives Utilization

Ref: Align Networks Data, Prospective Referrals with Applicable Guidelines ("Unknown" & "Other" injuries excluded), Client mix, 2013 Data

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Injury Treatment for Aging Worker
Treatment of Aging Workers is Unique

- Understand effects vision, hearing, and cognitive loss:
  - More auditory, visual prompts, cues
- Exercise prescription
  - Address bone, joint degenerative changes, loss of muscle strength, balance, slower tissue recovery times, metabolic and cardiovascular changes
- Many older individuals may be exercise intolerant due to co-morbidities, side effects from meds
- Sarcopenia can largely be prevented with a structured strengthening exercise program
  - Research indicates P.T. exercise programs with eccentric training and high velocity concentric training more effective than traditional exercise regimens (provided next section)
Exercise Rx: Strength Exercises

- Sarcopenia (age-related muscle loss) and Dynapenia (age-related loss of muscle strength) can largely be prevented
  - With structured strengthening exercise program
- Eccentric training & high velocity concentric training is more effective than traditional exercise regimens
- Strength training:
  - Improves balance
  - Reduces fall risk
  - Builds bone mass and reduces osteoporosis
- Reduction in falls = reduction work-related injuries, fractures
Eccentric vs. Concentric

Concentric:
- shortening of muscle
- resist load
- produce work

Eccentric:
- lengthening of muscle
- control load
- absorb energy
Exercise Rx:
Rapid Concentrics

- Peak muscle power (production of force AND velocity) declines with age (65+)
  - Earlier and faster than muscle strength
- Decreased muscle power production attributed to documented changes in muscle fiber quality and quantity (sarcopenia)

Preservation of **muscle strength** = dependence on the maintenance of muscle mass
Impairments in **muscle power** = more reflective of functional limitations

**High Velocity vs Low Velocity Resistance Training**

- **Concentric Exercises**
  - Shortens muscles
  - Free weights
  - Body weight
  - Traditional strengthening

- **Improved Muscle Power**
  - Multiple studies
  - Consistently greater improvements
  - High velocity vs lower speed exercises

Ref: Skeletal Muscle Power: A Critical Determinant of Physical Functioning in Older Adults, College of Sports Med. 2011
Exercise RX: Eccentrics

- Referred to as “Negative work”
  - Because muscle is absorbing the energy in a loaded position, slows contraction to control it
  - Measurable force production = highest
- Strength production = highest
- Muscle size = greatest gains
- Body Builders use 1: 4 count to load muscle and grow size fast
- Benefits to Aging Population:
  - Offer greater benefit to countering age related sarcopenia and dynapenia due to greater overloads through lower impact exercises
  - Require less energy, more easily tolerated by older population

Ref: The Power of Eccentrics for the Aging, APTA, 2013
Prevention of Injuries for Aging Workers
Injury Prevention

• PTs can be a resource in injury prevention for all workforce groups

• Injury prevention is a lifestyle choice

• Educate & encourage overall healthy lifestyle, general wellness:
  – Regular check-ups: dental, eye exam, physician exam
  – Proper diet & hydration
  – Regular exercise program

• Community safety: reduce risk for falls
  – Choose well lit walk-ways, slip resistant floor surfaces, remove trip hazards
Clinical Implications: Ergonomics

**Industrial Setting/related to material handling:**
- Forceful Exertion
- High Repetition
- Awkward Postures/ working outside of “optimal” or neutral joint postures
- Sustained postures
- Contact Stress
- **PPE/Gloves:** *Increase grip needed by 10%*
- Shift work/schedules/OT
- Continuous work/work cycles
- Extreme Temperature
- Vibration/Whole Body & Segmental Vibration

**Office setting:**
- High Repetition
- Awkward Postures/ working outside of “optimal” or neutral joint postures
- Sustained postures
- Contact Stress
Clinical Implications Ergonomics

Grip Strength Diminishes with Age:

- 40% loss through age ranges
- Use of gloves increases strength required to perform same task without gloves (10%)

Ex: Bifocals Ergo Accommodation:
Lower Computer monitor for bifocal user to reduce neck muscle/ligament strain

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Male (avg. Lbs)</th>
<th>Female (avg. Lbs.)</th>
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<tr>
<td>30-40</td>
<td>120</td>
<td>76</td>
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<tr>
<td>70+</td>
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- Teach ergonomic solutions for the workplace (IW takes ownership):
- Ergonomic Analysis/Accommodations: adjust work area to changes in body: modify grip/handles, adjust for vision changes, shelf height
- Posture, body mechanics, joint protection, work cycles
- Address M.O.I.: overexertion, postures to avoid end range, adequate work cycles, longer recovery times etc.
Solutions: Injury Prevention Programs

- Reduce risk for falls
- On-site Wellness
- Pre-work screening program / Fit for Duty Programs: match demands of body to work
- Considers physical abilities/limitation, work demands, work goals
- Proven success for proper hiring practices, reduced medical and workers’ compensation claims/costs
Driving Successful Outcomes
How industry stakeholders can facilitate best outcomes:

- Steer injured workers to best providers
  - Compliance
  - RTW outcomes
- Early identification and severity classification
- Analyzing outcomes data:
  - Understand nuances in state mix
  - Surgical vs. non surgical
  - Benchmarks
ADJUSTER/CENTRAL MANAGEMENT (CM)

How can claims staff help improve outcomes?
- Goals
- Job descriptions
- Focused plans

EMPLOYER/RISK MANAGEMENT (RM)

How can employers support the prevention of injuries and follow through post injury?
- Post offer testing
- Job descriptions
- Injury patterns
- Ergonomics
- Wellness

INJURED WORKER

How do we improve injured worker buy in and participation?
- Treatment involvement
- Buy in
- Confidence

PHYSICAL THERAPIST

How can medical providers drive RTW/SAW?
- Communicate
- Document
- Eyes and ears

Collaborate:  Focus on safety, preventing re-injury with Stay at Work, Return to Work focus

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Thank you!

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