Ergonomics for EVS: An Injury Prevention Approach

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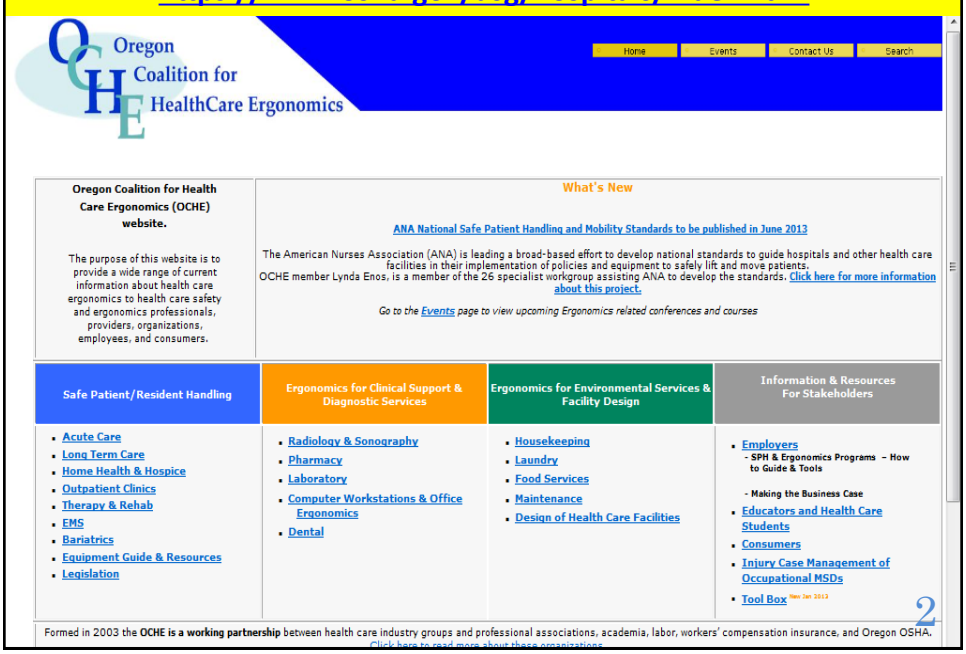
Find Resources at www.hcergo.org

https://www.osha.gov/dsg/hospitals/index.html



What are Musculoskeletal Disorders (MSDs)?

(Cumulative Trauma Disorder, Repetitive Strain Injury, Overexertion or Overuse Injury)

Acute:

A sudden or one-time traumatic event or incident, e.g., slip, trip, fall or car wreck

Chronic or Cumulative:

Injuries that occur over a period of time months/years) & are caused by a combination of risk factors

MSDs affect ligaments, muscles, tendons, cartilage, blood vessels & nerves & spinal discs

Some Common MSDs

- Sprains & Strains
- Lateral (or Medial) Epicondylitis (Tennis Elbow/Golfer's elbow)
- Trapezius Myalgia (tension neck syndrome)
- Tendonitis & Tenosynovitis
- Dequervain's disease (Tendonitis of the thumb)
- Trigger finger

- Rotator Cuff Tear (shoulder)
- Bursitis (shoulder or knees) Bricklayer's/Pitcher's Shoulder; Housemaid's knee)
- Low Back Pain/Bulging or Herniated Spinal Discs
- Carpal Tunnel Syndrome
  - *(not associated with keyboard use)*
- Plantar Fasciitis (Foot)

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Risk Factors that can Contribute to the Development of MSDs

Primary Risk Factors that can contribute to work related MSDs

Awkward, Static & Poor Postures

+/-

Force (Lift, Push, Pull, Carry, Grip

+/-

Repetition

+

Duration (Time)

= **MSDs**

Musculoskeletal Disorders

Additional Factors:

- Contact Stress
- Vibration
- Environmental e.g., Cold/Heat/Noise/Light
- Psychosocial Factors e.g., perceived stress & low control of work environment

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The Cumulative Effect

Duration – the length of exposure to a risk factor

Can be all at one time or cumulative over the day, months or even years of exposure to ergonomic risk factors before it becomes a concern.

Affected by:

- Working through breaks
- Overtime
- Task variability

When the musculoskeletal system is exposed to a combination of these risk factors (too quickly, too often and for too long) without sufficient recovery or rest time, damage occurs

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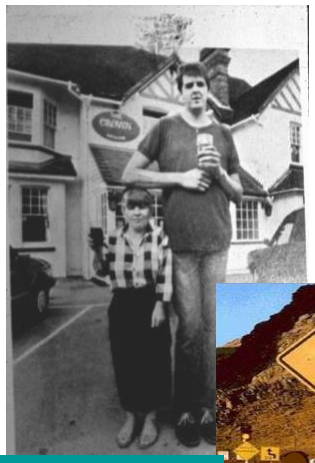
Using Ergonomics to Prevent MSDs

Designing Tasks, Equipment, Work Environments & *Systems* to be compatible with the Users' Physical & Cognitive Capabilities and Psychosocial Characteristics



Fitting the Task to the User

Preventing User Injury & Error; Improving Comfort & Efficiency/Quality

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Ergonomics Programs -Preventing MSDS Hierarchy of Controls

Most Effective

Primary Controls:

1. Eliminate the risk factor (s) through design

   Engineering of the:
   - Task
   - Tools
   - Equipment
   - Facilities

Secondary Controls:

2. Work Practice changes
3. Administrative - Reduce exposure of person to the job
4. Warnings
5. Training
6. Personal Protective equipment
7. Wellness & Fitness

Least Effective

HumanFit

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Components of Successful Ergonomics Programs – Preventing MSDs

Culture (Behavior) Change & Program Sustainability

- **Management Commitment** (visible program champion)
- **Employee Involvement** (inc. labor)
- **A Business Plan** (strategic & tactical)
- **Program Management** (program facilitator)
- **Worksite Analysis**
- **Hazard Prevention & Control** (equipment, safe work practices, proactive design)
- **Education & Training** (inc. ongoing coaching)
- **Disability Management** ('after action' review)

Multifaceted programs are more effective than any single intervention

(NIOSH, 1997; OSHA 1991 & 2003; VAH 2014)

Environmental Services (EVS)

- "Perform a variety of general cleaning tasks to maintain patient rooms, offices, hallways, and other assigned areas of the hospital."
- "Move, remove, and relocate furniture, furnishings, equipment, etc."
- "Considerable reaching, stooping, bending, kneeling, crouching, moderate to heavy physical effort (lift/carry/push up to 50 lbs.)."
- "Prolonged, extensive, or considerable standing/walking."

(Providence Health and Services, 2018)

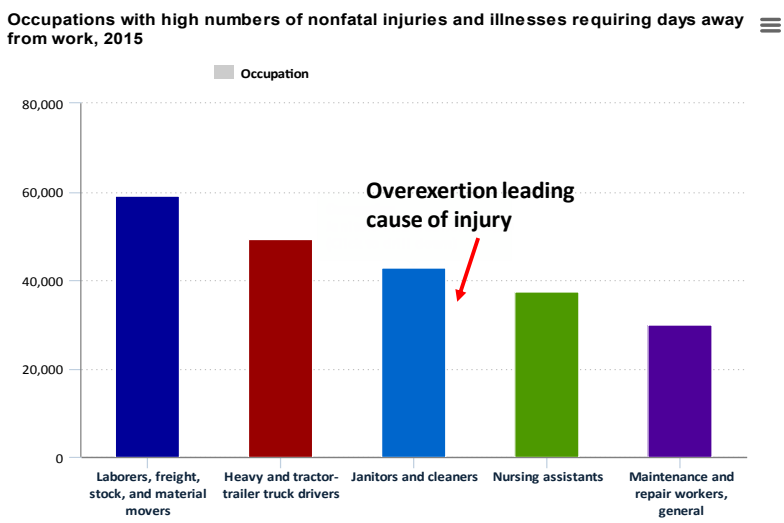
(CalOSHA, 2005)

Injury rates for Janitors and Cleaners

- Incidence rates per 10,000 FTE
- Nonfatal occupational injuries and illnesses
- Days away from work

	All occupations	Janitors and Cleaners, except Maids and Housekeeping Cleaners (code 372011)
	2016	2016
All Injuries & Illnesses	91.7	178.6
Musculoskeletal disorders	29.4	58.8
Overexertion and bodily reaction	30.9	61.2

Injuries, illnesses, and days away



Source: U.S. Bureau of Labor Statistics.

Full cost of worker injuries

Direct Costs (Largely Workers Comp)
Indirect Costs (e.g. temp and permanent staff replacement costs)

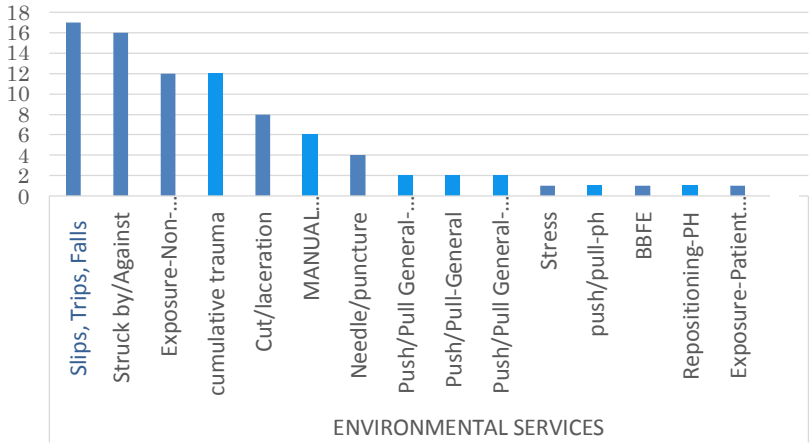
- Operational Losses
  - Staff Turnover
  - Quality of Care/Service
  - Decreased Efficiency (Impact of Fatigue, Presenteeism, etc.)
- Cost of Compensating Actions (e.g. Training)
- "Human" Error & Accidents

Typical EVS Injuries

- **Moving beds** – "Moving bed and felt lower back pain"
- **Lifting linen** – "Lifted linen bag to drop in chute and injured wrists"
- **Pushing carts** – "Pushing and pulling housekeeping cart"
- **Mopping** – "Mopping a room and heard arm pop"
- **Cleaning** – "Cleaning patient room and felt neck and shoulder pain"
- **Cumulative Trauma** – "My back is really sore", "Numbness and tingling in both hands"

(Providence Health and Services, 2018)

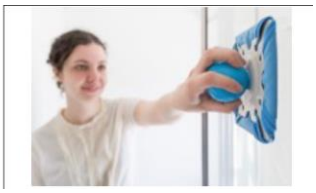
2017 EVS injuries by category



(Providence Health and Services, 2018)

Solutions

Scrubbing and dusting



Challenges

- Extreme reach (overhead)
- Awkward posture (bending, kneeling, squatting)
- Bent wrists, repetitive motions and high grip forces

Solutions

- Long-handled tools
- Angled or pivoting heads
- Adjustable handle lengths, cleaning heads as light as possible (e.g. microfiber), battery-powered scrubbers (EU-OSHA, 2009)

Vacuuming

Challenges

- Repetitive motions (hand, arm)
- Grip force
- Pushing and pulling, lifting and lowering
- Bending wrist and back
- Noise (increasing stress and muscle tension)

Solutions

- Lighter weight canister
- Adjustable "Ergonomic" handles
- Self-propelled upright vacuums
- Long hoses
- Lower noise levels (EU-OSHA, 2009)

Vacuum technology

(Janitorialstore.com, 2018)

Buffing

Source: www.unoclean.com/

Challenges

- Awkward position
- Torque when starting transfers vibration to upper extremity
- Heavy lifting
- Slip/trip/fall risk

Solutions

- Self-propelled machine with walk-behind or ride-on option
- Reduced vibration via product design, consistent maintenance and servicing (EU-OSHA, 2009)

Mopping

Challenges

- Heavy, awkward lifting
- Bending
- Squatting to lift bucket from floor
- Wringing
- Lifting and carrying wet mop

Solutions

- Adjustable, light-weight equipment
- More ergonomic location of sinks/taps
- Improved work practices and work organization (EU-OSHA, 2009)

(CalOSHA, 2005)

Handling trash and linen

Challenges

- Lifting heavy trash and linen bags from bins
- Creating vacuum in cans, which increases force to remove (trash)
- Significant push-pull forces

Solutions

- Replace large trash bins with smaller, lighter bins
- Vent sides of trash cans
- Relocate dumpsters, compactors, and bins to be accessed from above or to safe operating height (EU-OSHA, 2009)

Trash and linen risks

Moving furniture

(Aethon, 2018)

Challenges

- Lifting, carrying, pushing, and pulling furniture
- Operating furniture (e.g. patient recliners)

Solutions

- Lighter furniture
- Wheeled furniture
- User-friendly furniture controls (EU-OSHA, 2009)

Vancouver Island case study

- Partnership between 471-bed regional hospital and Provincial Workers' Comp Board
- Aimed to eliminate linen lifting injuries, reduce MSDs, injury costs, and BBFEs
- Reduced 4 time-loss claims/year to **Zero**
- 94% "good" or "excellent" on staff satisfaction survey
- $48,508 annual savings and initial $147,000 investment recouped in 4 years (Newlands et al, 2002)

Mop and bucket study

- Mop/bucket risks and challenges
- Flat-mop and backpack benefits
- Newer, lightweight application

(Brown, L., 2009)

(CalOSHA, 2005)

Mop study findings

(CalOSHA, 2005)

- Muscle contraction and heart rate monitoring
- 36% less forearm flexor effort 36% less erector spinae effort 35% less deltoid effort 23% less trapezius effort
- Overall heart output was 50% less with new system

(Brown, L., 2009)

Vacuum backpack study

- Challenges of upright vacuums
  - Only forward-back motion
  - Pushing weight of entire machine each stroke
  - Upright vacuum handles position caregiver closer to floor (Standley, S., Murray,C., & Woellner, R., 2004)

(CalOSHA, 2005)

Vacuum pack benefits

- Upright body position
- Greater range of vacuum movement/coverage
- Decreased energy output and twice the cleaning rate
- Reduced weight
  - Traditional uprights = 20-30lbs
  - New backpack technology = 10lbs.
- Neutral position – Two-handed operation, elbows locked at sides which limits extreme reach
- Custom fit

(Standley, S., Murray,C., & Woellner, R., 2004)

(Webstaurantstore.com, 2018)

Providence processes

- Collaboration among Workers' Compensation, Injury Prevention & Ergonomics, Safety, Caregiver Health, Executive Leadership, and Unit/Department Leadership
- Return-to-work/Transitional duty
- Employer-at-Injury Program (EAIP)

Worksite and risk assessments

(CalOSHA, 2005)

- Individual caregivers
- Departmental risk assessments
- Training, in-servicing

Potential Program Funding Sources

- **Employee at Injury Fund (EAIP) ($5000 per injured worker while on transitional duty- in Oregon**
- **Preferred Worker Program – to $50,000 (Oregon)**

http://wcd.oregon.gov/rtw/Pages/index.aspx

(CalOSHA, 2005)

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Questions & Discussion