Ergonomics in Collections Care

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Questions or comments, please contact: HealthandSafety@conservation-us.org
Outline

- Ergonomics
  - Definition, uses
  - 3 examples: awkward positions, lifting, prolonged sitting

- Back
  - “Neutral Position”
  - Anatomy
  - Injury causes
  - Prevention
Ergonomics

Definition: Principles related to humans and their work
“Human factors”

Greek: Ergon (relating to work, accomplishments)
Nomos (laws or principles)

Applications of ergonomics;
Uses; examples-
productivity
ease of use
safety
injury prevention
Ergonomics

Uses; examples-
- productivity
- ease of use
- safety
- injury prevention
Ergonomics - injury prevention

- Back Injuries

- Cumulative Trauma Disorders
  (aka; Repetitive Strain Injuries, Repetitive Motion Injuries)
  - Examples
    - Carpal Tunnel Syndrome
    - Tendinitis
    - Epicondylitis
    - Others
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Awkward position?
Awkward Position in Collections Care?
Ergonomics

- Awkward Postures?
  - Solution; reposition the work, equipment, tools
  - Not the body
Ergonomics

- Prolonged sitting

- Lifting
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Ergonomics

Neutral Position

- 7 Cervical vertebrae
- 12 Thoracic vertebrae
- 5 Lumbar vertebrae
- Sacrum
- Coccyx
Back - Anatomy

Muscles

- Always pull (never push)
  - Contract, can stretch
- 2 types of muscle
  - Strength type
  - Coordination type

- Injured by;
  - Stretching too far
    - E.g. sudden slip
  - Contracting too strongly
    - E.g. heavy lift
  - Stretching or Contracting too long in duration
    - E.g. awkward or prolonged positions
Lifting - Ergonomic studies

Figure 27 Warehouse Order Filling, Example 10
LINES DEPICT EQUAL LIFTING STRENGTHS (kg)

VERTICAL DISTANCE FROM FLOOR TO HANDS (cm)

HORIZONTAL DISTANCE FROM FORWARD ANKLE TO HANDS (cm)

Predicted Lifting Strength of Large/Strong Male (Chaffin, 1974).
Twisting “Isolates” muscles - Bad
Ergonomics

- **Back Injuries**: look at injury rates for tasks

- **Ergonomics**;
  - Lifting with back muscles - very high strain, high injury rate
    
    **Lift with legs**
  - Lifting from floor - worse than from table
    
    **Kneel down, bring load close to body**
  - Lifting far from body - worse than close
    
    **Bring load close to body**
  - Twisting, awkward - “isolates,” strains muscles
    
    **Move feet, carry load in front, close to body**
Wrong way to lift

Right way to lift
Ergonomics

Inflammation; ( - itis)

• Pharynx inflammation => pharyngitis

Musculoskeletal injuries examples

• Tendon => tendinitis
• Synovium => synovitis
• Muscle => myositis
Early Treatment for Simple Back Injuries

- **Rest**: the affected muscles
  - Gentle range of motion exercises
  - Maintain neutral posture

- **Ice**: helps reduce inflammation acutely
  - 1\textsuperscript{st} hours -> 24 hours
  - No frostbite
  - Heat: may help more after 24 hours
    - Repeated warming of tissues with slow cool down.

- **Medications**: anti-inflammatory (NSAIDS)
  - Side effects; GI irritation, bleeding, interactions with other meds.
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Prolonged Sitting
Posture Pro

http://www.thebrainybuyer.com/2013/07/03/angel-sales-posture-pro-lumbar-support-only-4-58-shipped/
Ergonomics – Chair adjustment
Ergonomics - Sitting

- Back/neck
- Legs/feet
- Arms/wrists

* Remember: glare
Resources

- Canadian Centre for Occupational Health and Safety
  - [http://www.ccohs.ca/oshanswers/ergonomics/](http://www.ccohs.ca/oshanswers/ergonomics/)

- Occupational Safety and Health Administration (OSHA)
  - [https://www.osha.gov/SLTC/ergonomics/controlhazards.html](https://www.osha.gov/SLTC/ergonomics/controlhazards.html)

- CDC/ NIOSH (Nat’l Inst. For Occ. Safety and Health)
  - [http://www.cdc.gov/niosh/topics/ergonomics/](http://www.cdc.gov/niosh/topics/ergonomics/)
The End!