Back Injury Prevention

WSU- TFREC
Safety Training
Back Injury Prevention

Training Outline

• Basic structures & functions of the back
• Common back injuries
• Maintaining a healthy back
• Back injury risk factors
• Manual material handling
• Proper lifting techniques
• Other back stressors
Structures of the Spine

Anatomy of the spine

Cervical Spine (Neck)

Thoracic Spine (Mid Back)

Lumbar Spine (Low Back)

Sacrum (Tail Bone)
# Functions of the Spine

## Summary of the Spine’s Functions

| Protection                  | • Spinal cord and nerve roots  
|                            | • Many internal organs          |
| Base for attachment        | • Ligaments                
|                            | • Tendons                   
|                            | • Muscles                   |
| Structural support         | • Head, shoulders, chest    
|                            | • Balance and weight distribution |
| Flexibility and mobility   | • Flexion (forward bending)  
|                            | • Extension (backward bending) |
|                            | • Side bending (left and right) |
|                            | • Rotation (left and right)   |
|                            | • Combination of the above    |
Back Injuries

• Estimated that 85 – 95% will suffer from low back pain

• Acute events vs. cumulative trauma
Back Injuries

- L5/S1 incurs the greatest stress:
  - Compression
  - Shear
  - Torsion
Back Injuries

- Muscle and tendon sprains
- Ligament strains
- Vertebrae fractures
- Disc problems
Back Injury Risk Factors

- General health
- Genetics
- Injury history
- Recreational activities
- Home activities
- Work tasks
  - Lifting, lowering, carrying, pushing and pulling
  - Awkward and static postures
Maintaining a Healthy Back

We use our backs 24/7: how we live affects our back’s health

- Reduce Stress
- Balance Diet
- Quit Smoking
- Exercise
- Strength
- Flexibility
- Endurance
Maintaining a Healthy Back

Sitting

Standing
Manual Material Handling

Manual Material Handling is the:

- lifting
- lowering
- pushing
- pulling
- and carrying...

of objects, tools, equipment and supplies.
Manual Material Handling

Methods to control back stressors when manually handling materials:

• Minimize the amount of weight handled
• Use a material handling device
• Breakdown/repackage into smaller packages
• Order smaller size packages
Manual Material Handling

So how much can you safely lift?

- It depends on a number of factors:
  - Who is doing the lifting
  - How frequent are the lifts (lifts/minute)
  - How long is the lifting task (lifts/total time)
  - Is twisting and bending part of the lift
  - Object weight, size, contents, and shape (hand holds)

Frequency, duration and intensity are the key factors
Manual Material Handling

So how much can you safely lift?

• It depends on who you ask:
  • CDC/ NIOSH = 51 lb
  • ACGIH = 70 lb
  • WA State Department of Safety & Health repealed ergonomics standard = 90 lb
Proper Lifting

Five factors to consider:

1. Object weight (heft test)
2. Object size, contents, shape – hand holds
3. Frequency of the lifts
4. Vertical distance of the lifts
5. Horizontal distance between the object and person
Proper Lifting

Two most important factors:

1. Object weight (heft test)
2. Object size, contents, shape – hand holds
3. Frequency of the lifts
4. Vertical distance of the lifts
5. Horizontal distance between the object and person
Effect of Horizontal Distance

\[(30 \text{ lb} \times 36 \text{ in}) + (85 \text{ lb} \times 12 \text{ in}) = 2,100 \text{ in-lb}\]

\[(30 \text{ lb} \times 16 \text{ in}) + (85 \text{ lb} \times 0 \text{ in}) = 480 \text{ in-lb}\]
Proper Lifting Technique

1. Plan the lift
2. Spread feet shoulder width apart
3. Maintain the curves of the spine
4. Bend at the knees
5. Head up and chin up
6. Lift slowly and evenly
7. Avoid twisting
8. Keep load close to your body!
9. Maintain clear field of view
Lifting Techniques

The Diagonal Lift

The Power Lift
Other Back Stressors

- Prolonged standing
- Prolonged sitting
- Vibration
- Using tools
- Slips, trips and falls
- Pushing and pulling
- Prolonged and frequent bending, reaching and turning