Safe Lifting is Not an Accident

Kansas State University
Division of Public Safety
Objectives for Today

• Lever Arms and Lifting
• Basic understanding of the spinal column
• Functions of the disc
• Bending – Twisting – Loading
• Keys to safe lifting
• Get a grip!!!
Injury in the making
How to Injure Yourself
Cumulative Trauma

- Daily stress to the body
- When exposed to high risk activities
- If stress > bodies ability to recover
- Result is inflammation
- Long term exposure = cumulative trauma
Cumulative Trauma Risk Factors

• Repetition
• Forceful exertion
• Awkward and/or sustained postures
• Mechanical Stress
The goal of ergonomics is to make an activity easy and safe to perform.
We need your help

- Prevention
- Early Intervention
- Training
- Implementation
- Eyes on the floor
- Feedback
Level Arms & Lifting
Low Back Pain

• Review of the anatomy
  – normal curves
  – bony columns
  – function of the disc
  – spinal cord & nerve roots
  – degenerative issues

• Maintain the balance
Normal Curves of the Spine
The Spine & Nerve Roots

Vertebra
Disk
Nerve leaving spinal canal
Sciatic nerve
Columns of Support

• Posterior column of support
  – made up of the facet column
  – very stable
  – reflects an upright posture

• Anterior column of support
  – made up of body of vertebra and the disc
  – less stable
  – reflects a flexed posture
The Disc & Never Root

- The disc is the shock absorber of the spine
- 85% water at the age of 15
- 25% water at the age of 75
Degenerative Disc
The Mechanics of Forward Bending
Forward Bending

• Too much spinal flexion
  – loads the anterior column of support
  – places the posterior wall of the disc at risk
  – has the potential for nerve root compromise
Bulging Disc

Bulging disc

Irritated nerve
Herniated Disc
The Issue of Flexion

• Avoid excessive flexion of the spine
• Flexed postures increases your risk of disc and nerve root involvement
• Maintain up-right postures - not back bends...
• Think posture
Safe Lifting

- Up-right neutral posture
- Posterior column of support
- Stable = less risk of injury
Avoid Twisting
Disc Pressure

• Lying flat: disc pressure equals 25 psi
• Standing: disc pressure equals 100 psi
• Sitting erect: disc pressure equals 100 psi
• Sitting slouched: pressure equals 150-175 psi
• Lifting 25# box from the floor in a flexed posture: disc pressure equals > 400 psi
Balance the Curves
Work Smart-Not Hard...
Test Your Loads- Seek Help
Consider Different Choices
Having a Bad Day???
Safe-Lifting is Not an Accident

- Avoid spinal flexion
- Avoid twisting
- Avoid increasing disc pressure
- Avoid reaching

- Maintain up-right neutral postures
- Hips = shoulders
- Elbows at your sides
- Keep the load close to your body
Get a Grip...
Anatomy of a Tendon
Tendonitis

- Tendon function: transmit force from muscle to bone
- Micro tears of tendon occur daily
- Typically repair themselves
- With repeated loading repair is not adequate
- Pain / Inflammation
Influences on Your Grip

• Required physical effort
  – Type of grip
  – Object weight
  – Distribution of weight
  – Object dimension
  – Required posture
  – Duration of effort
Pinch and Posting Grip
Getting a Grip in 110
DeQuervain’s Syndrome
A More Appropriate “C” Grip

Balance the Load
So, How Strong are you?
We’ve Been Here Before

- Prevention is the key
- Early intervention
- Keep it simple ….. We will get to difficult
- Think neutral postures
- Decrease heights
- Shorten “lever arms”
In Closing... Where do we go?
Slow Down
Stop and assess the situation
Don’t be afraid to get some help
Listen and pay attention