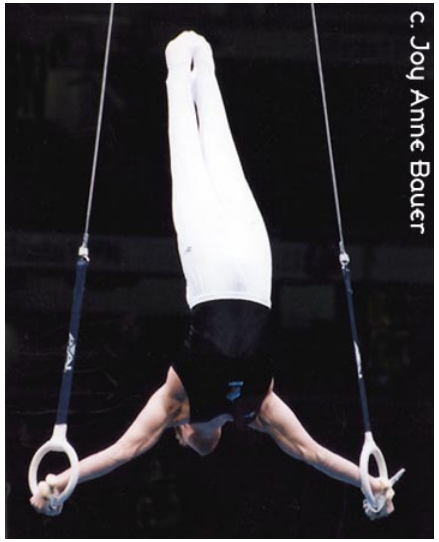
Safe Lifting is Not an Accident

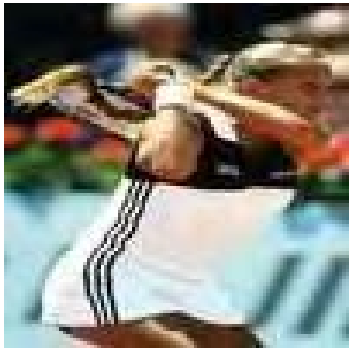
Kansas State University
Division of Public Safety

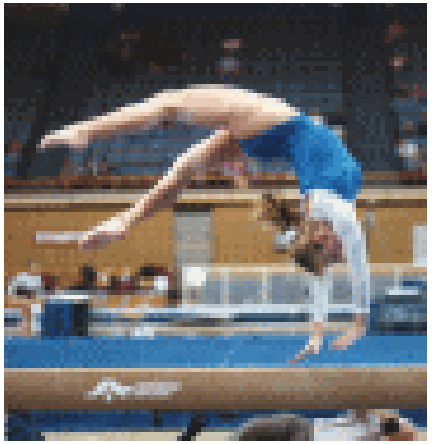
Objectives for Today

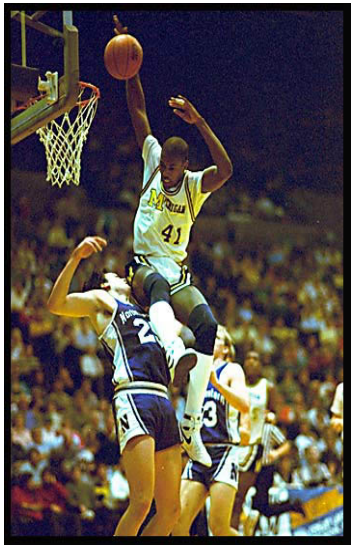
- Lever Arms and Lifting
- Basic understanding of the spinal column
- Functions of the disc
- Bending – Twisting – Loading
- Keys to safe lifting
- Get a grip!!!

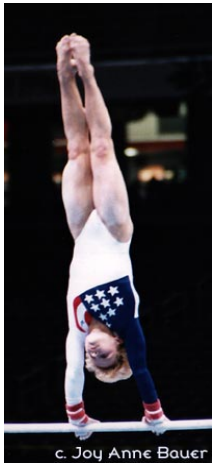
Injury in the making











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 Bottom Line

The goal of ergonomics is to make an activity easy and safe to perform.

We need your help

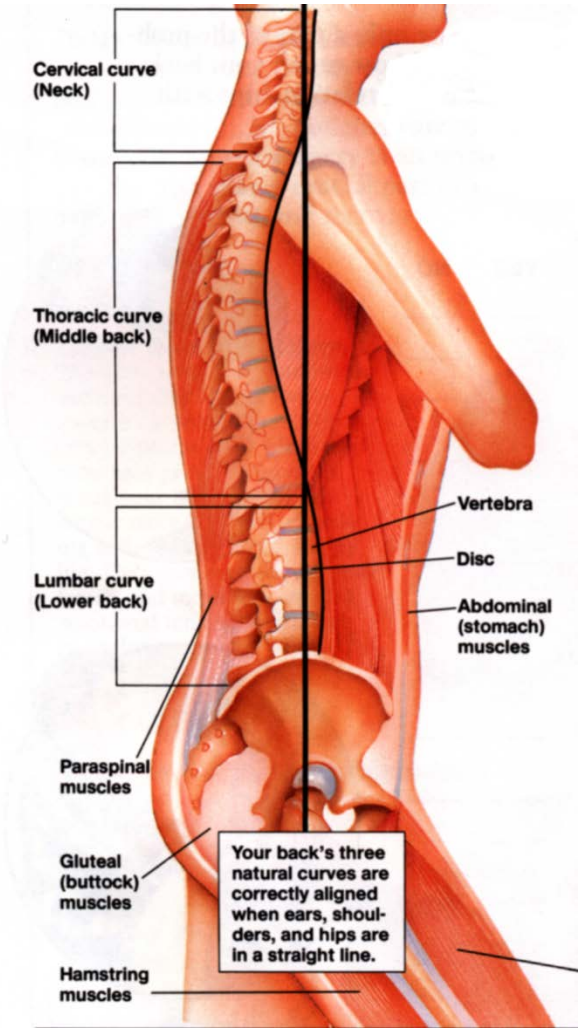
- Prevention
- Early Intervention
- Training
- Implementation
- Eyes on the floor
- Feedback

Level Arms & Lifting

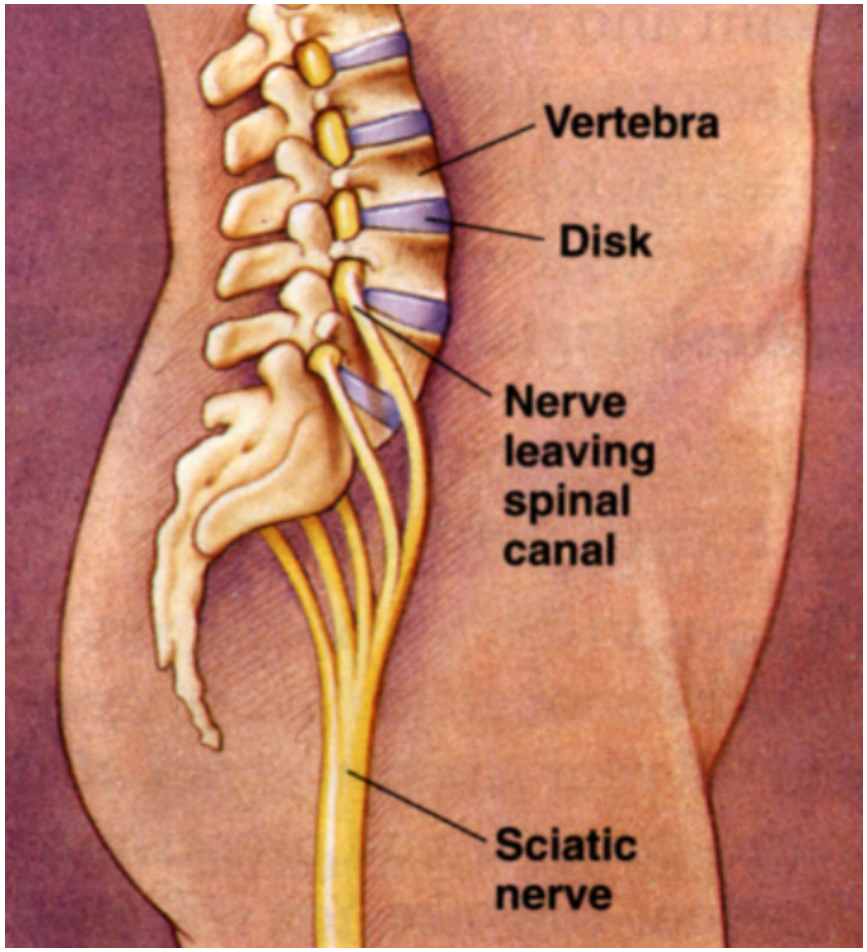
Low Back Pain

- 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

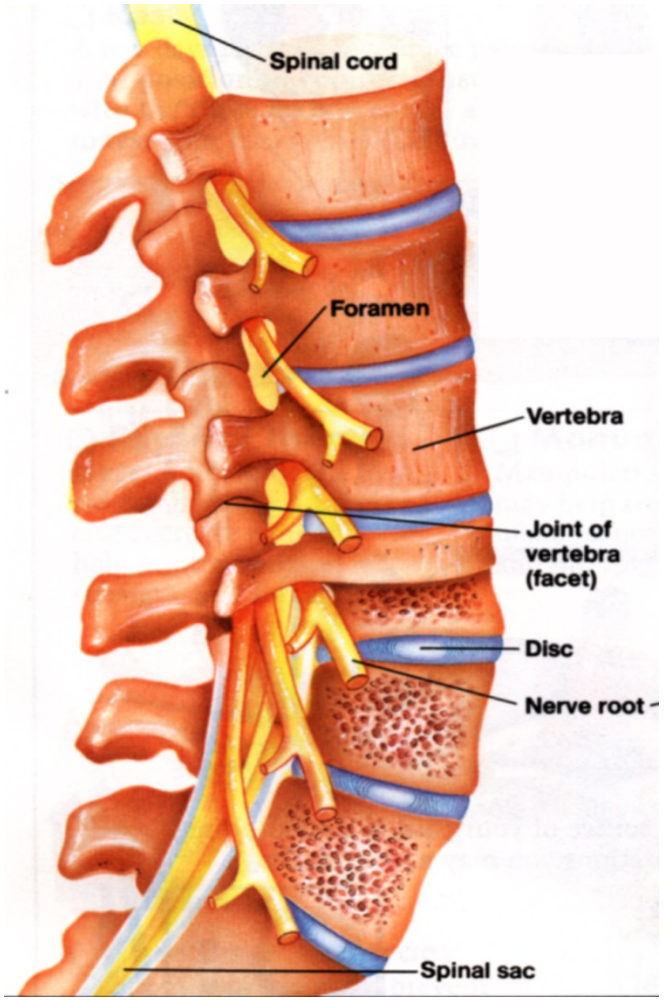


Columns of Support

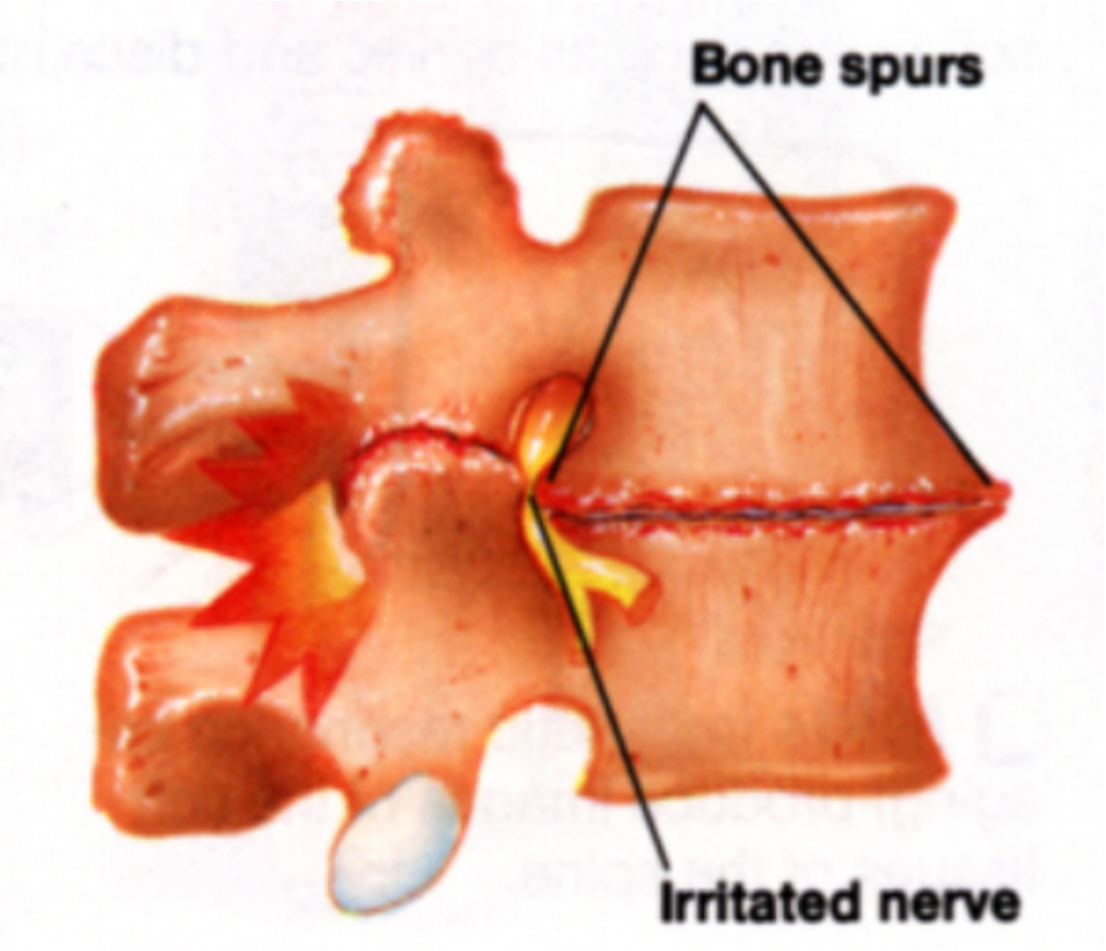
- Posterior column of support
  - made up of the facet column
  - very stable
  - reflects an upright posture
- Anterior column of support
  - made up of body of vertebra and the disc
  - less stable
  - reflects a flexed posture

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



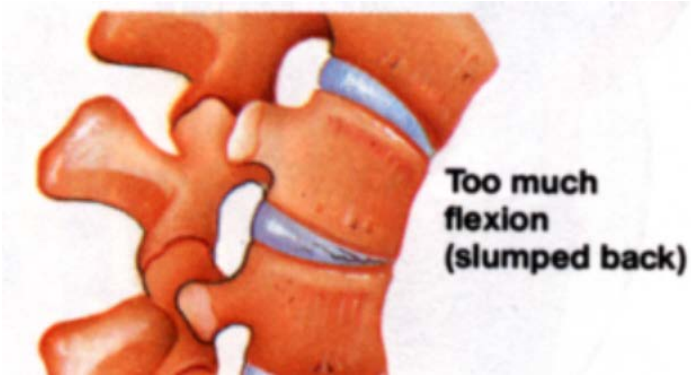
Degenerative Disc



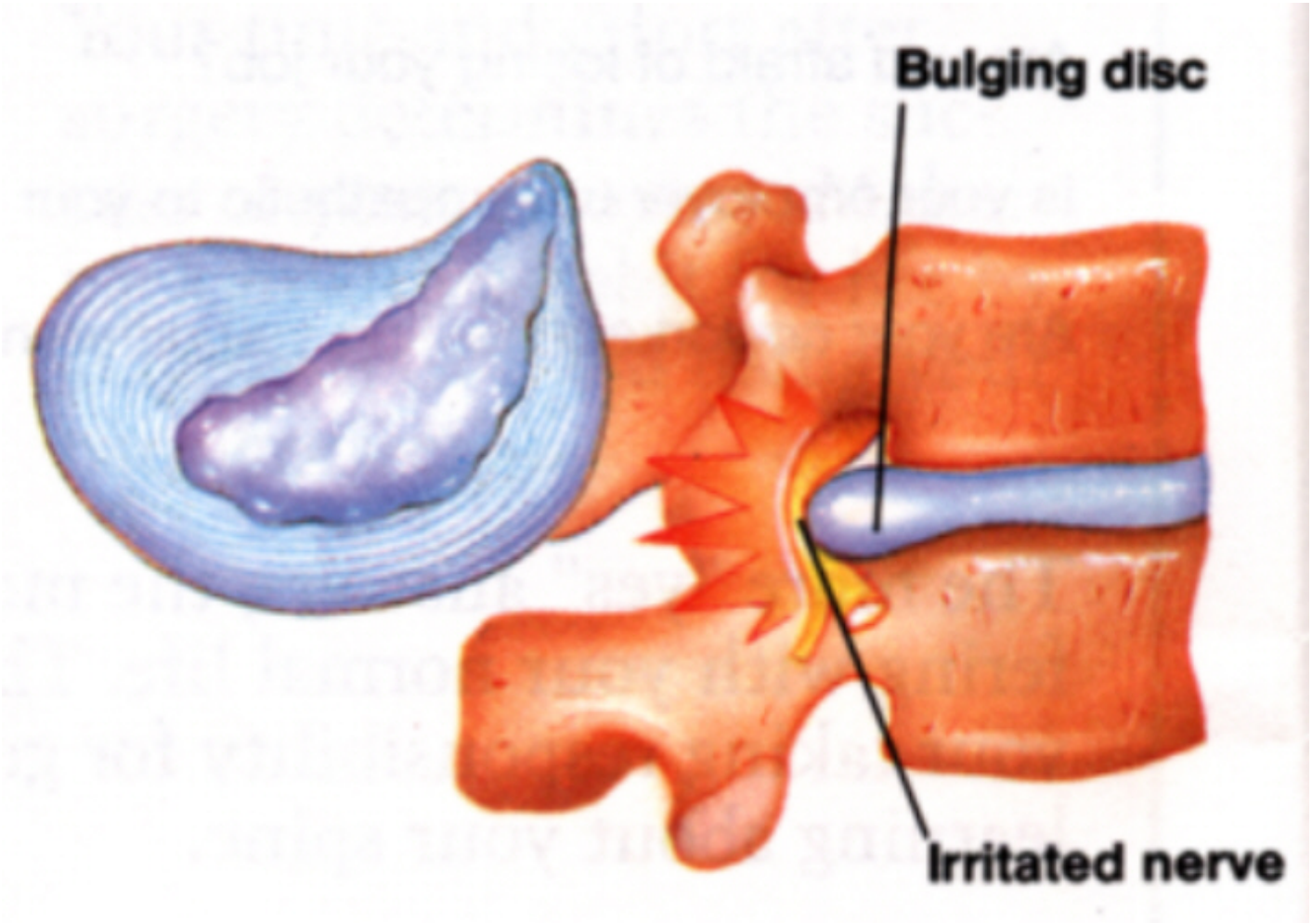
The Mechanics of Forward Bending

Forward Bending

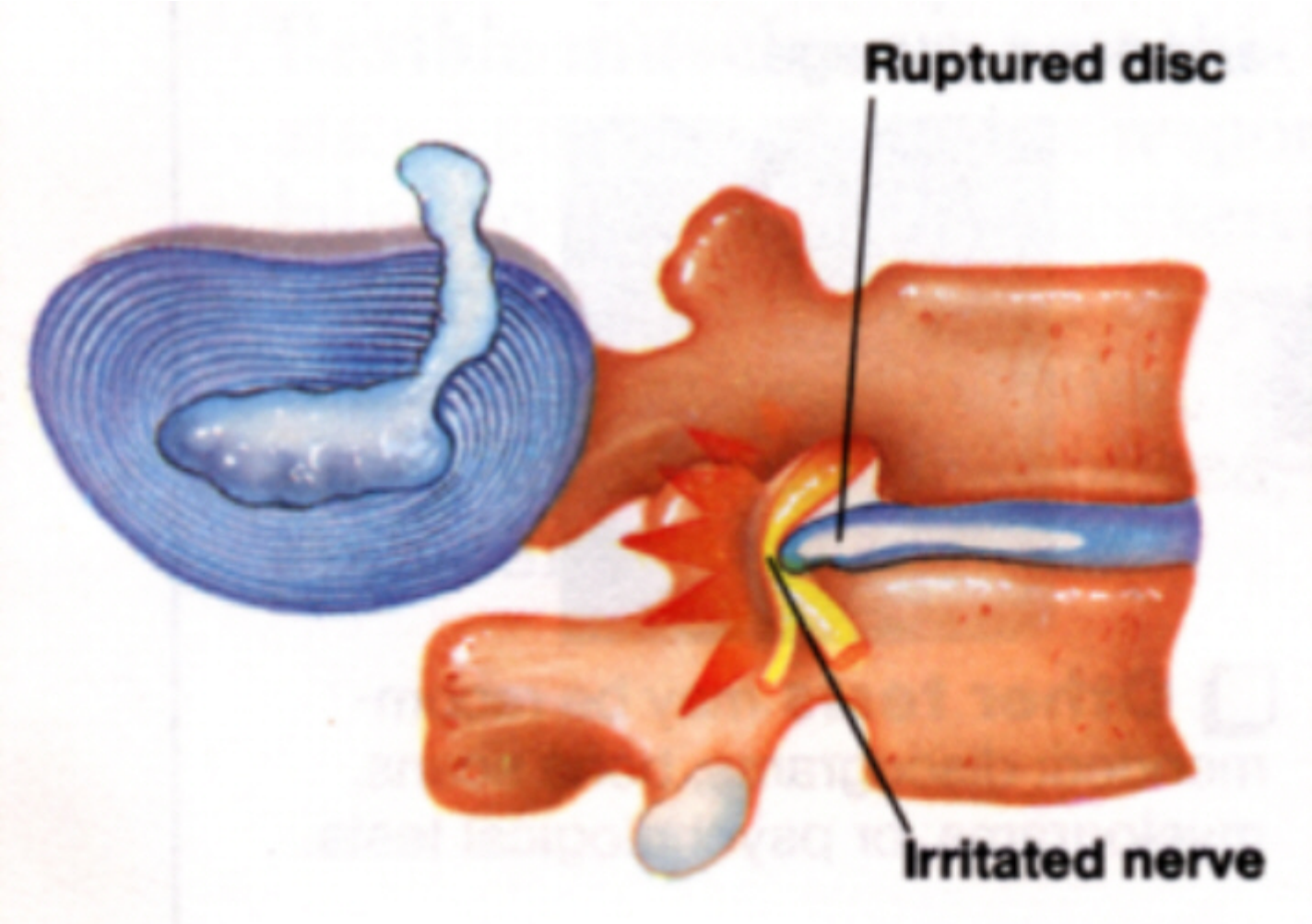
- Too much spinal flexion
  - loads the anterior column of support
  - places the posterior wall of the disc at risk
  - has the potential for nerve root compromise



Bulging Disc



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

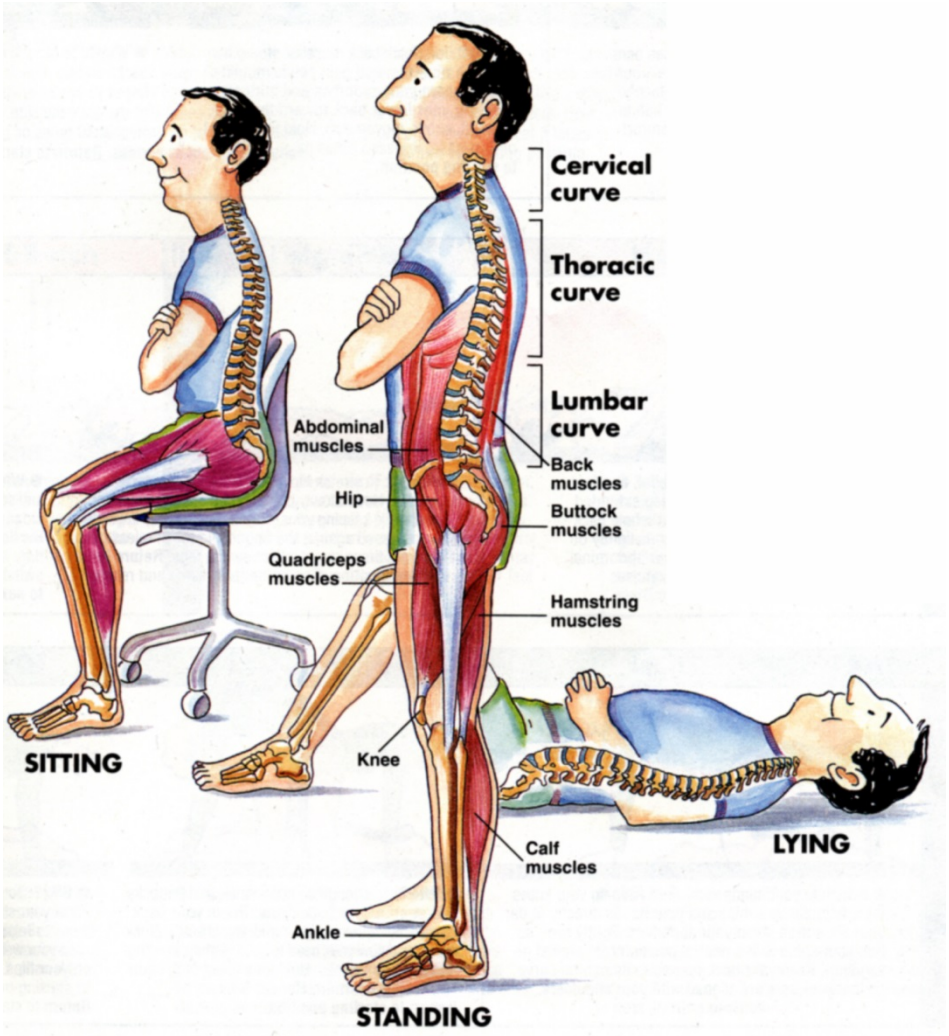
- Up-right neutral posture
- Posterior column of support
- Stable = less risk of injury

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

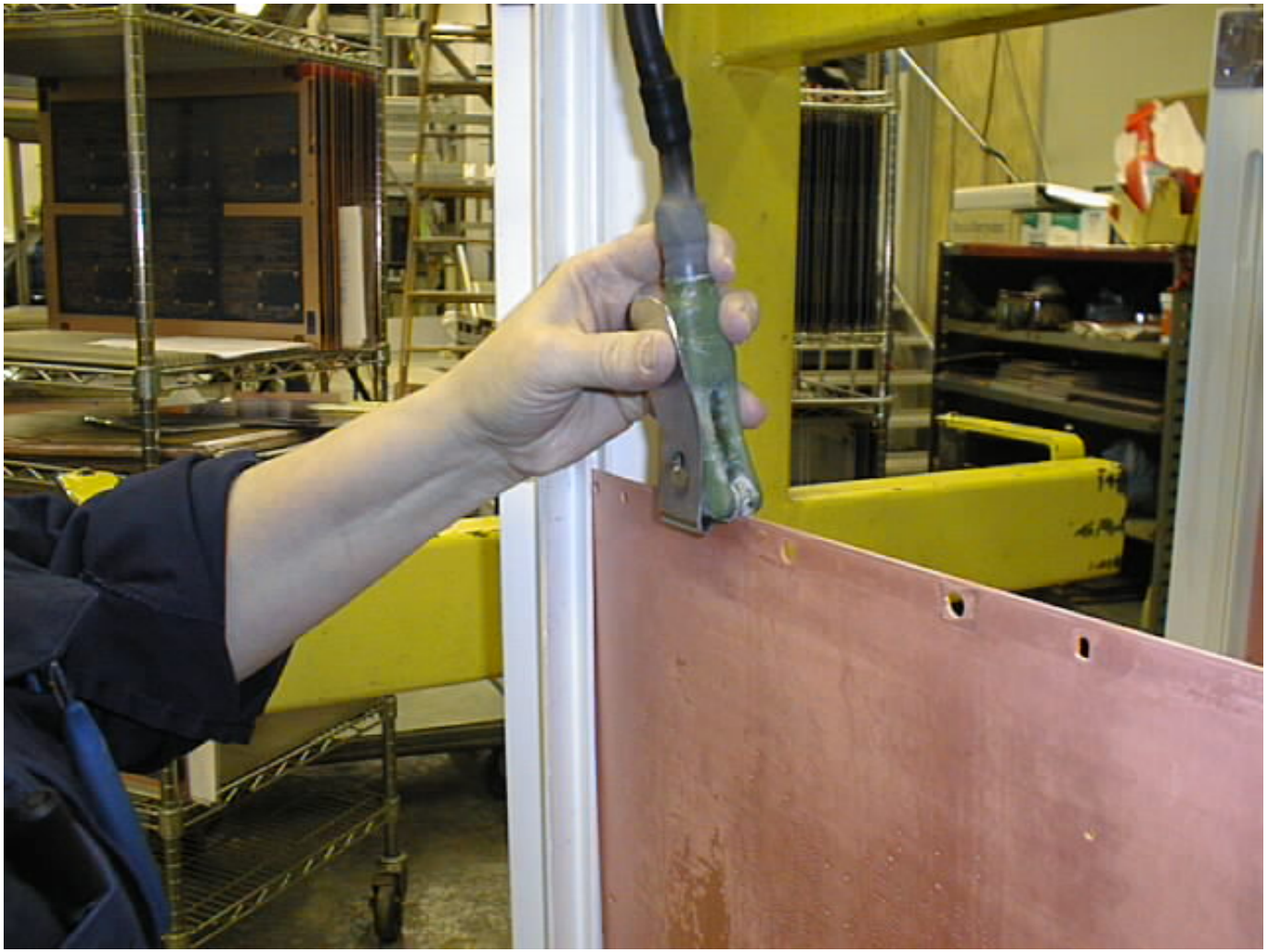
Having a Bad Day???

Safe-Lifting is Not an Accident

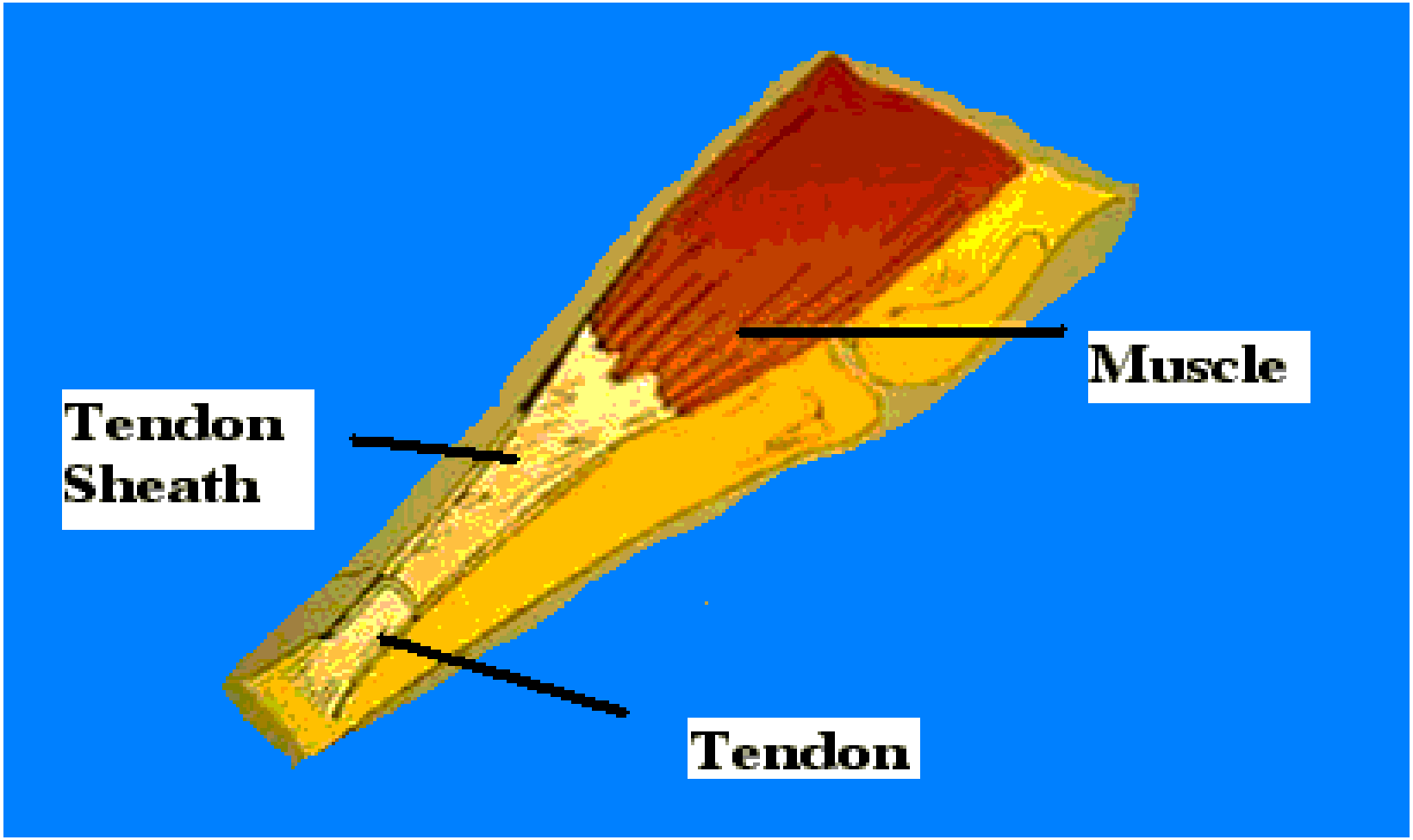
- Avoid spinal flexion
- Avoid twisting
- Avoid increasing disc pressure
- Avoid reaching

- 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

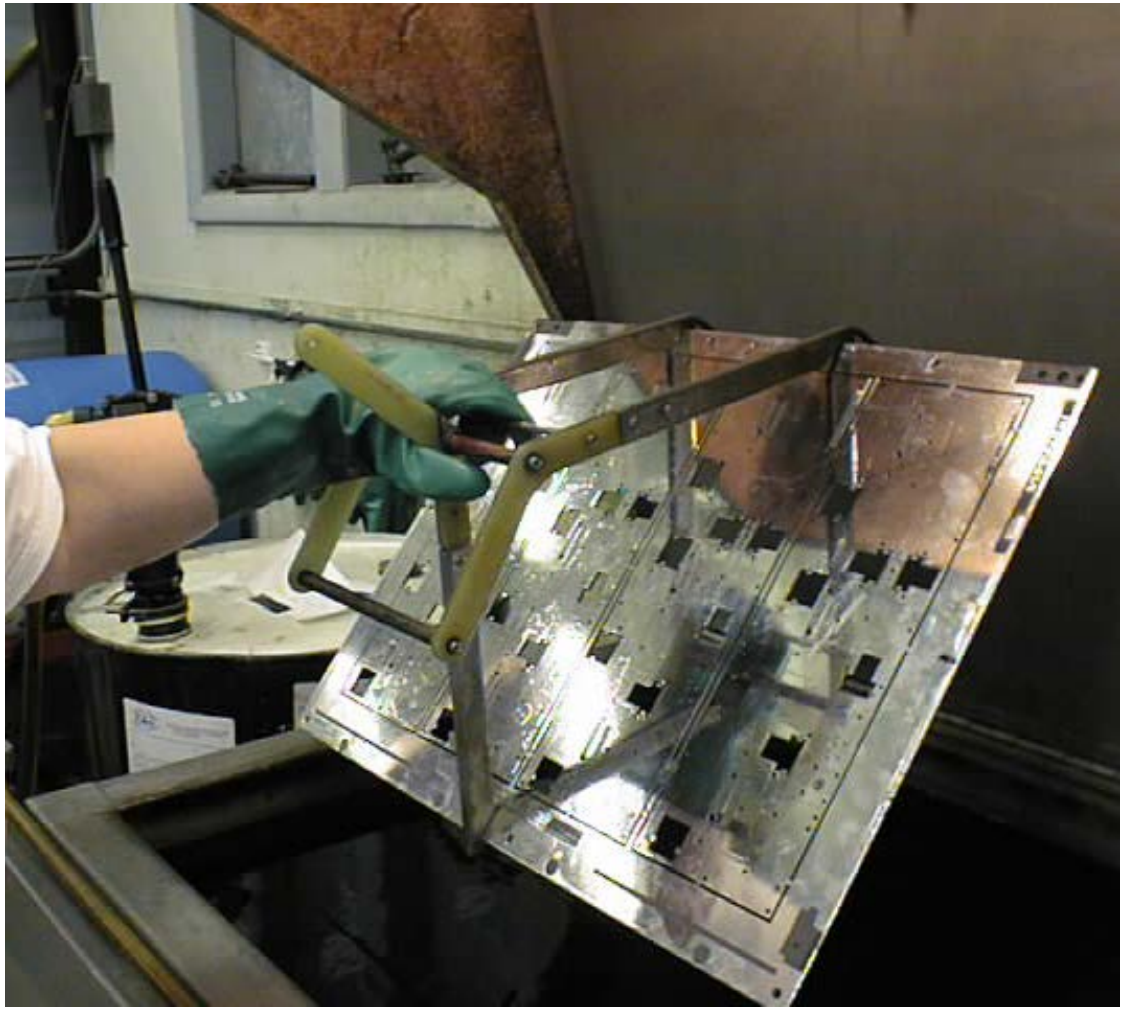
- Tendon function: transmit force from muscle to bone
- Micro tears of tendon occur daily
- Typically repair themselves
- With repeated loading repair is not adequate
- Pain / Inflammation

Influences on Your Grip

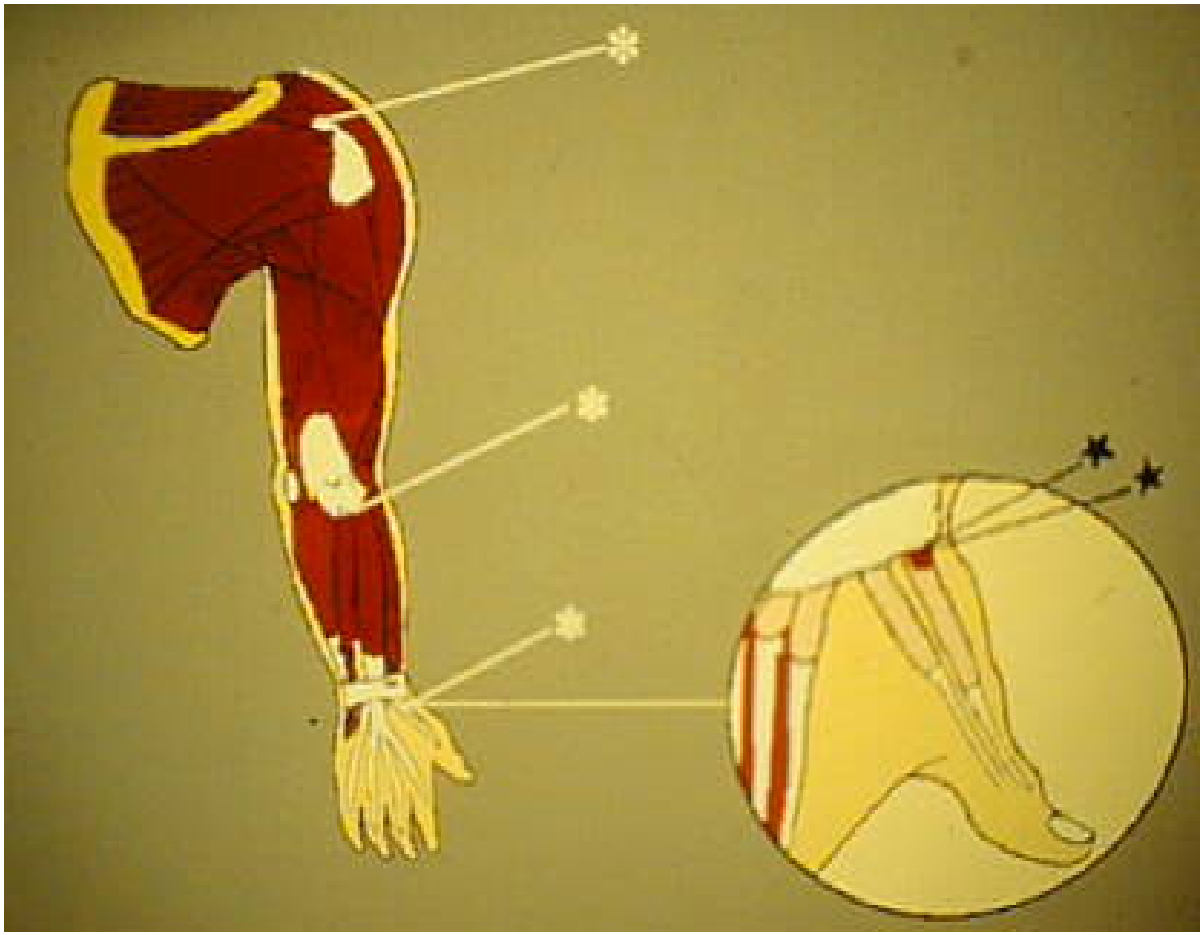
- Required physical effort
  - Type of grip
  - Object weight
  - Distribution of weight
  - Object dimension
  - Required posture
  - Duration of effort

Pinch and Posting Grip

Getting a Grip in 110



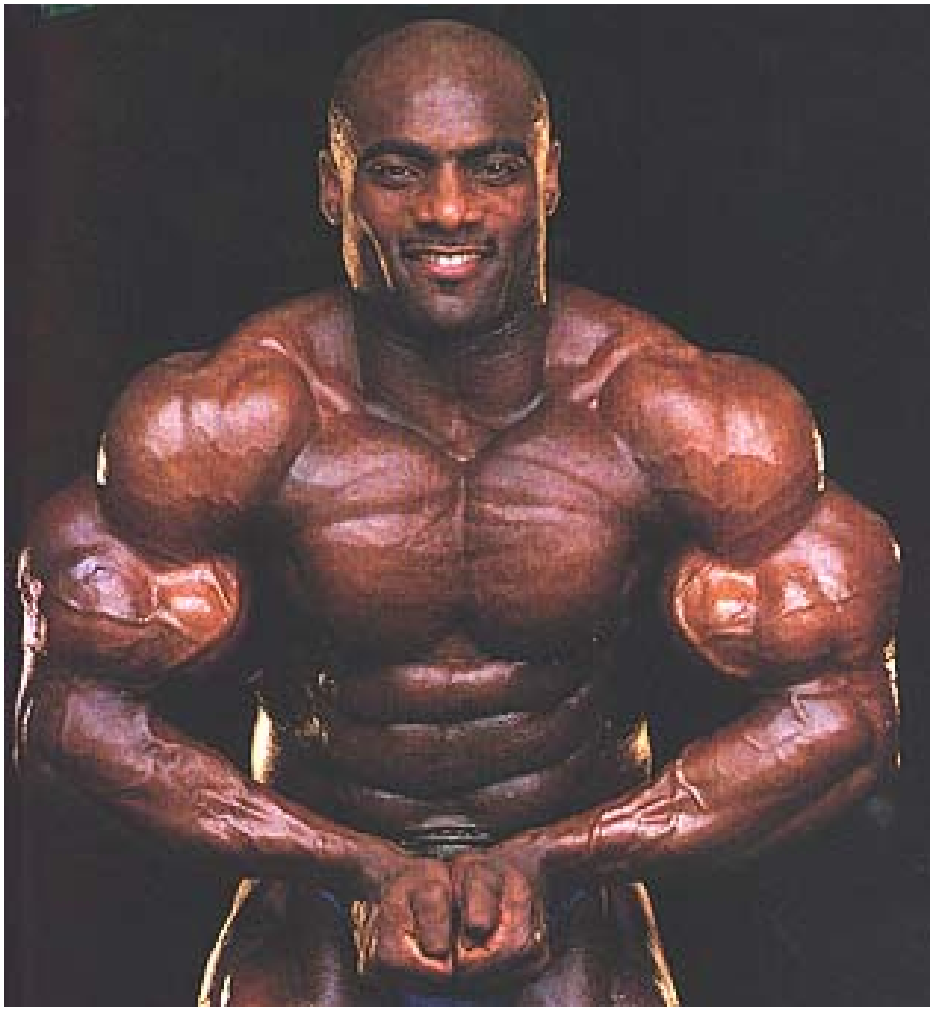
DeQuervain's Syndrome



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