



IN THE NAME OF GOD



# ***Work-related Musculoskeletal Disorders***



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# What Does Ergonomics Mean?

- ◆ **“Make the work fit the person,  
not the person fit the work”**

**WORK-RELATED  
MUSCULOSKELETAL  
DISORDERS**

**WMSDs are sometimes referred to using other unfamiliar terms such as :**

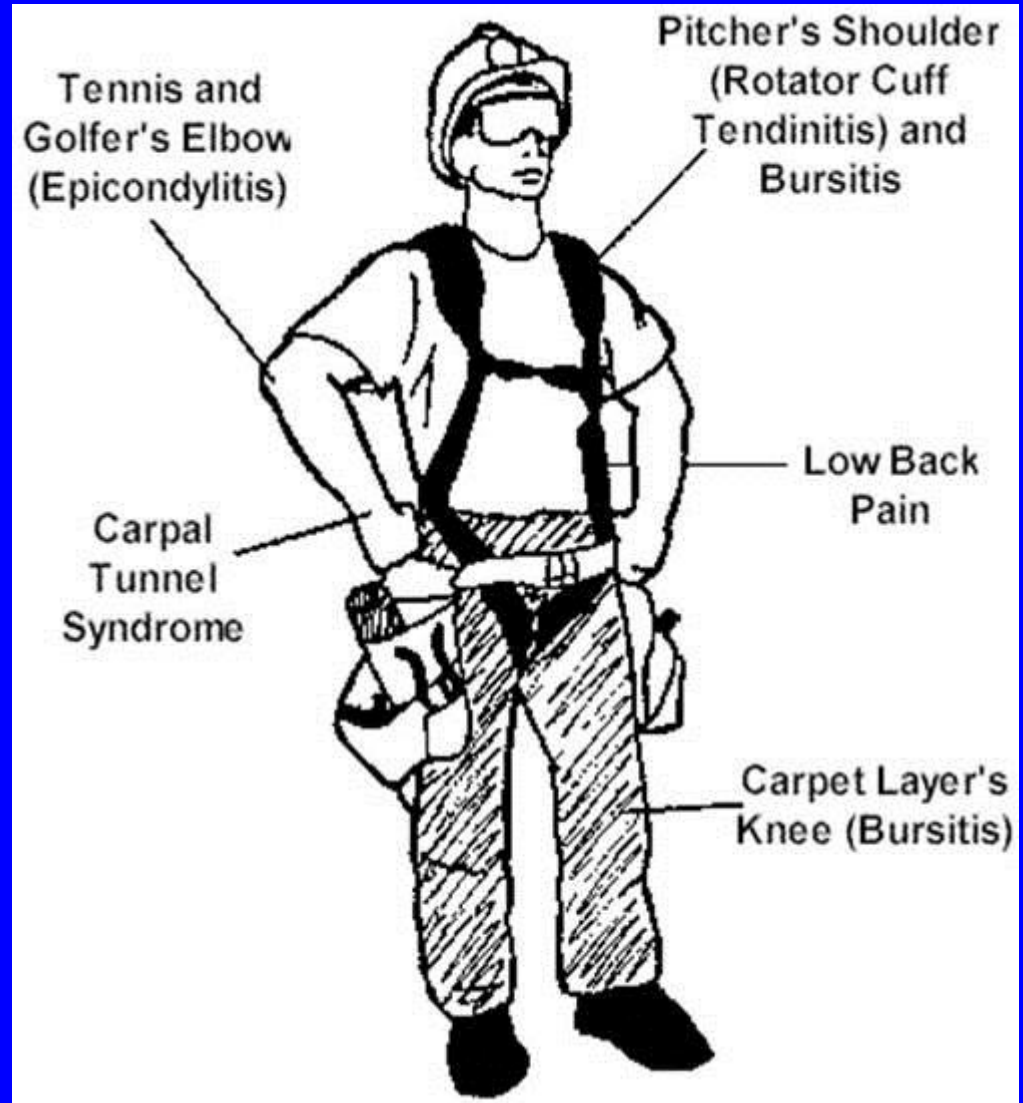
- 1. Cumulative Trauma Disorders – CTD**
- 2. Repetitive Trauma Disorders – RTD**
- 3. Repetitive Strain Injuries – RSI**
- 4. Repeated Motion Disorders – RMD**
- 5. Overuse Syndromes**

# Signs or Symptoms of WMSDs

- ◆ Painful joints
- ◆ Pain in wrists, shoulders, forearms, knees, etc.
- ◆ Pain, tingling or numbness in hands or feet
- ◆ Fingers or toes turning white
- ◆ Shooting or stabbing pains in arms or legs
- ◆ Back or neck pain
- ◆ Swelling or inflammation
- ◆ Stiffness
- ◆ Burning sensations
- ◆ Weakness or clumsiness in hands; dropping things

# ERGONOMICS

**Work-Related Musculoskeletal Disorders (WMSDs)** are occupational disorders that involve soft tissues such as **muscles, tendons, ligaments, joints, blood vessels and nerves**



# **Ergonomical (Job) Risk Factors**

- ***Sustained or Repeated Application of Force***
- ***Sustained Awkward Postures***
- ***Rapid, Repeated Motion***
- ***Vibration***
- ***Mechanical Contact Stress***
- ***Cold Temperatures***
- ***Static Postures***



# **What is The Musculoskeletal System?**

**The Musculoskeletal System includes the following:**

- 1. Bones – The load-bearing structure of the body**
- 2. Muscles- Tissue that contract to create movement**
- 3. Tendons – Tissues that connect muscles to bones**
- 4. Ligaments – Tissues that connect bones to bones**
- 5. Cartilage – Tissue that provides cushioning and reduces friction between bones**
- 6. Nerves – Communication system that links muscles, tendons and other tissue with the brain**
- 7. Blood Vessels – Tubes that circulate nutrients throughout the body**

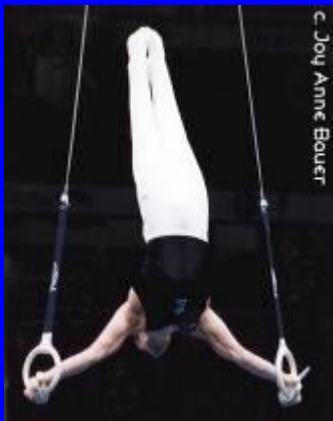
# What Are Examples of WMSDs?

1. **Sprain** – Overstretching or overexertion of a ligament that results in a tear or rupture of the ligament
2. **Strain** – Overstretching or overexertion of a muscle or tendon
3. **Tendonitis** – Inflammation of the tendon inside the sheath
4. **Tenosynovitis** – Inflammation of the sheath around the tendon
5. **Carpal Tunnel Syndrome** – Compression of the median nerve as it passes through the carpal tunnel in the heel of the hand

# What are Examples of WMSDs?

6. **Tennis elbow or Golfer's elbow** – Medical term is **Epicondylitis** – inflammation of the tendons at the elbow.
7. **Trigger Finger** – Common term for tendonitis or tenosynovitis that causes painful locking of the finger(s) while flexing
8. **Pitcher's Shoulder** – Rotator cuff tendonitis – inflammation of one or more tendons at the shoulder
9. **White Finger** – Medical term is **Reynaud's Phenomenon** – constriction of the blood vessels in the hands and fingers
10. **Digital Neuritis** – Compression of the nerves along the sides of the fingers or thumbs

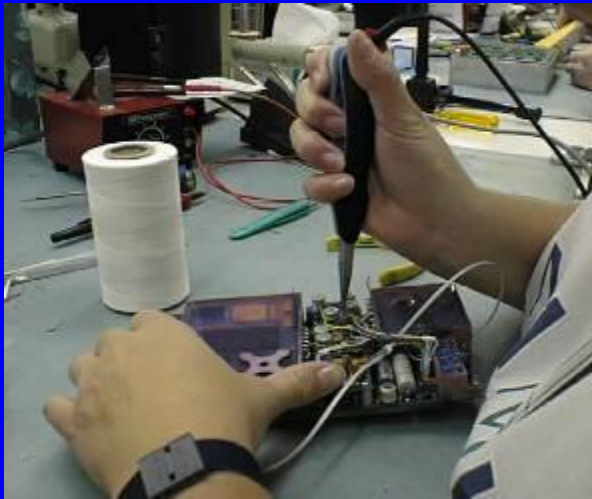
# Injury in the Sport



c. Joy Anne Bauer

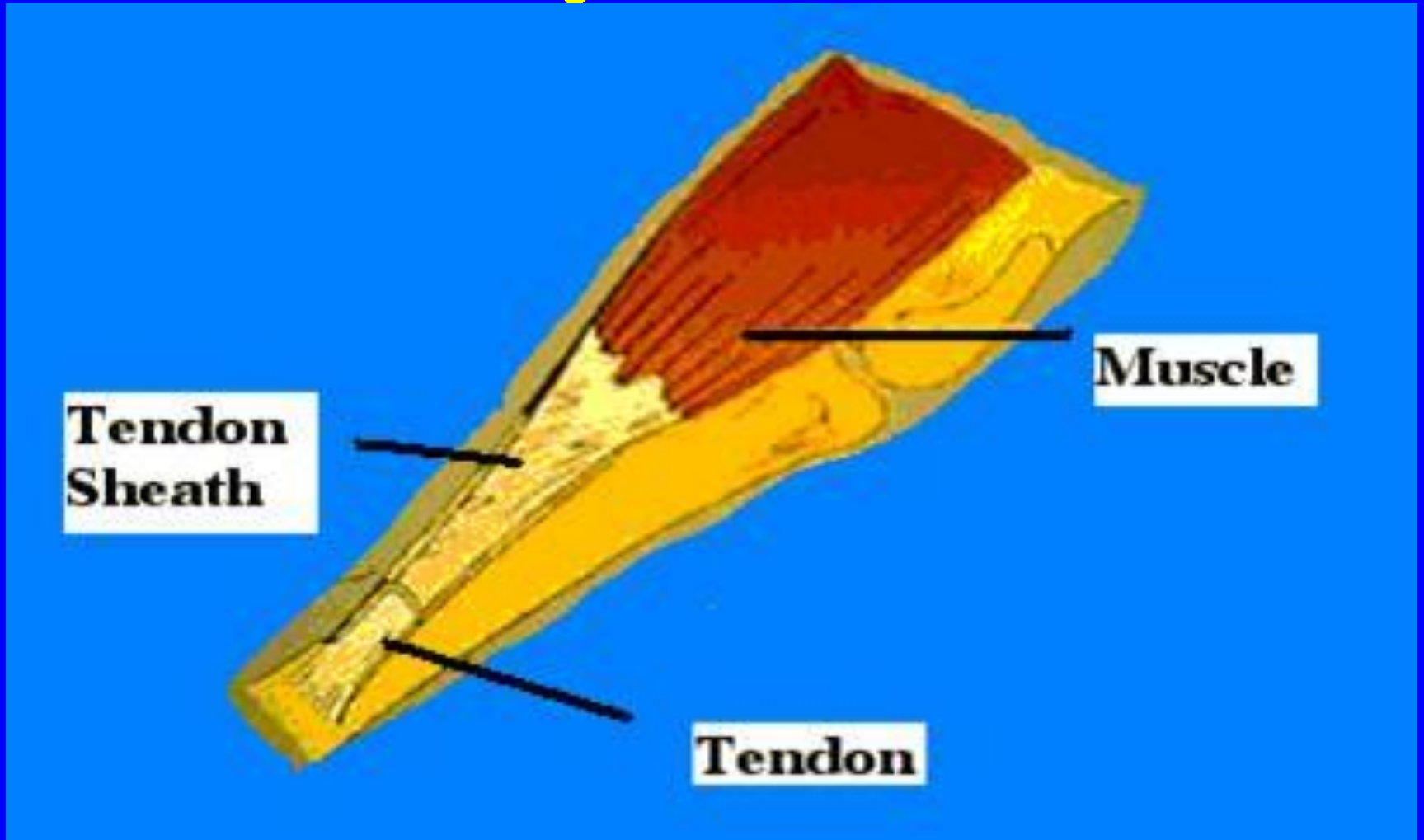


# Examples of work





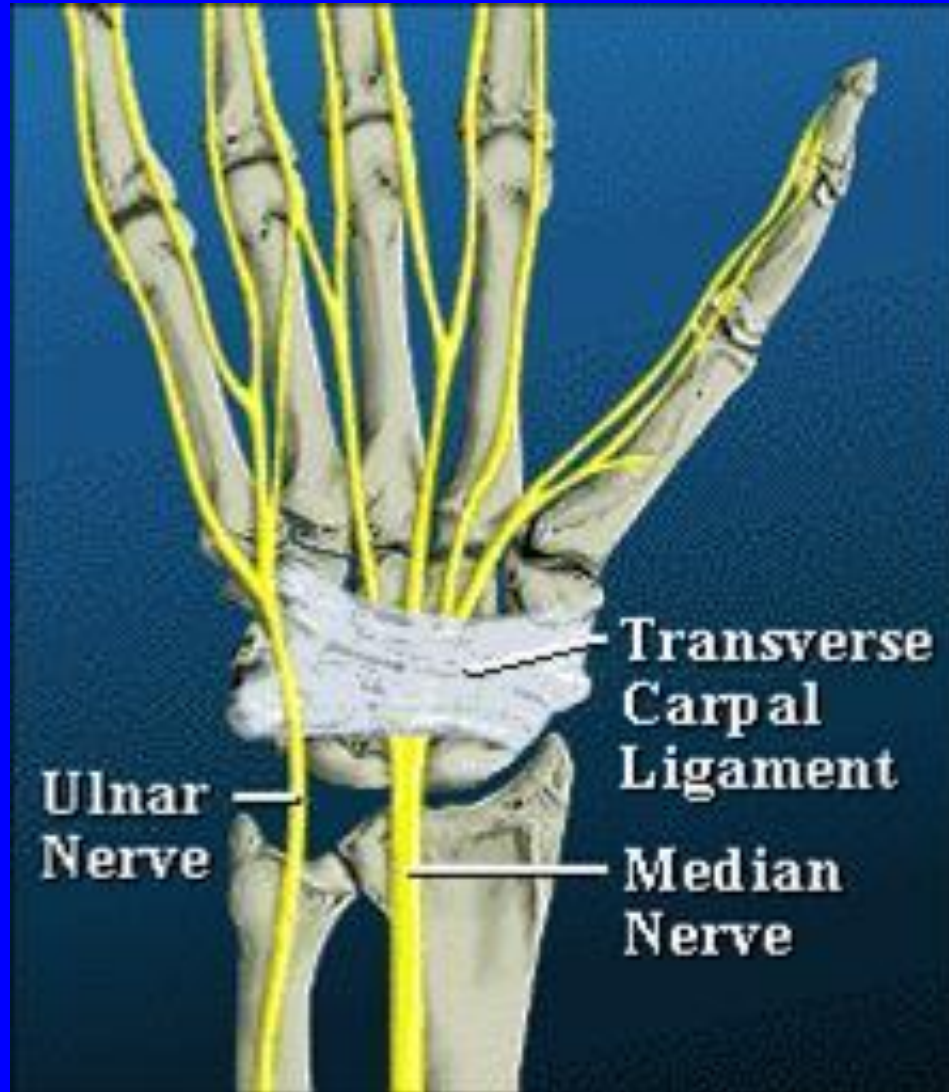
# Anatomy of a Tendon



# 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**

# Carpal Tunnel

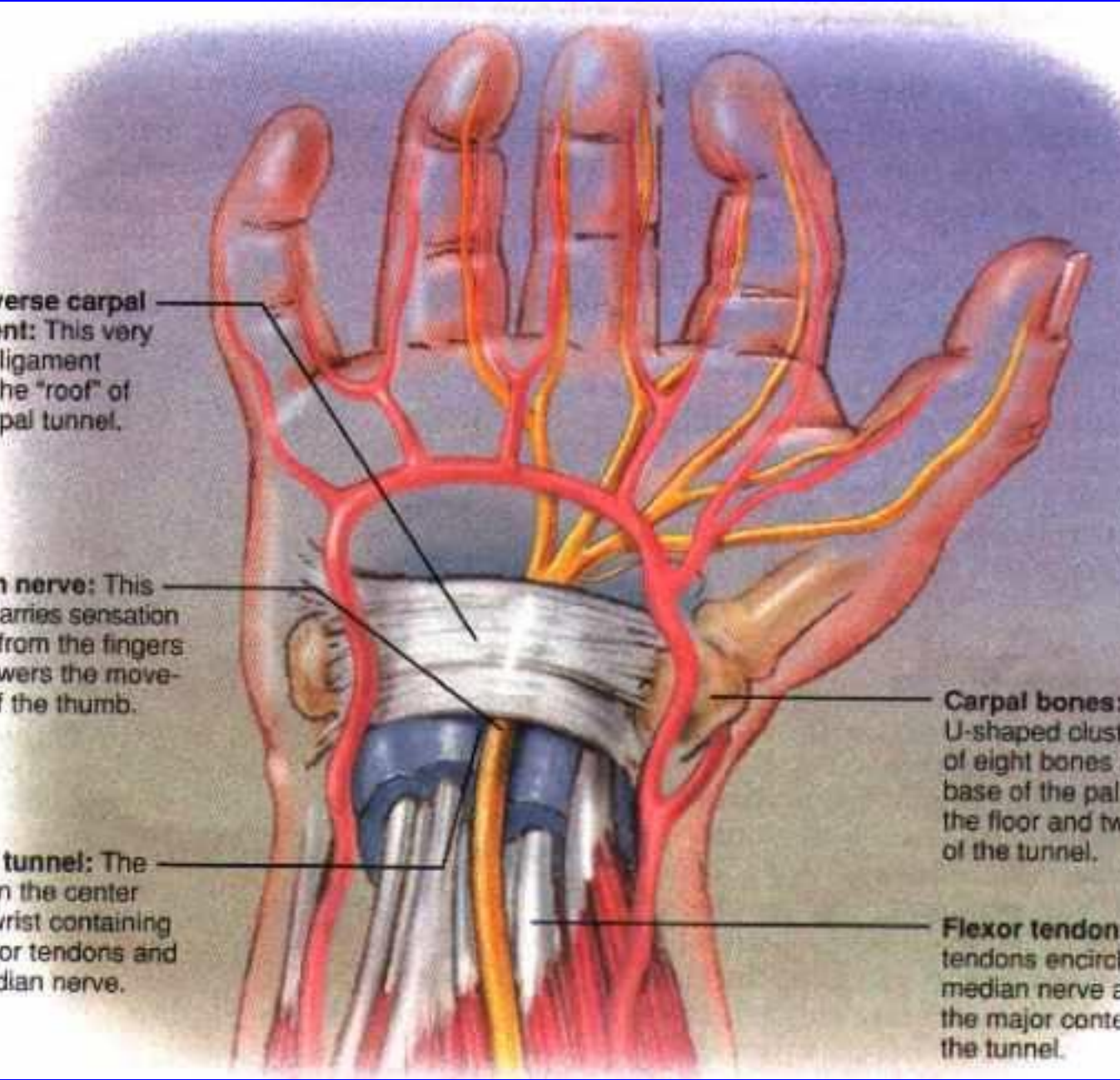


# Carpal Tunnel

- **Best known MSD**
- **Compression of the median nerve at the wrist**
- **Tunnel made up of nine flexor tendons and one peripheral nerve**
- **Numbness and tingling on the thumb side of the hand**







**Transverse carpal ligament:** This very strong ligament forms the "roof" of the carpal tunnel.

**Median nerve:** This nerve carries sensation to and from the fingers and powers the movement of the thumb.

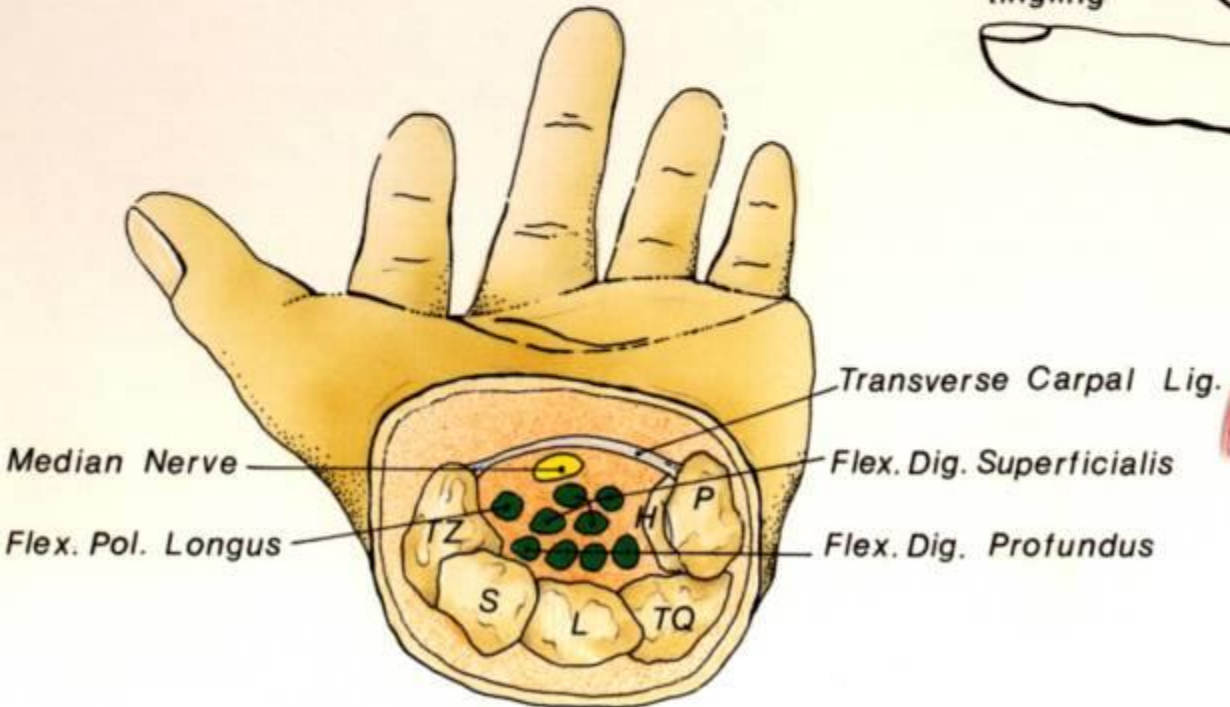
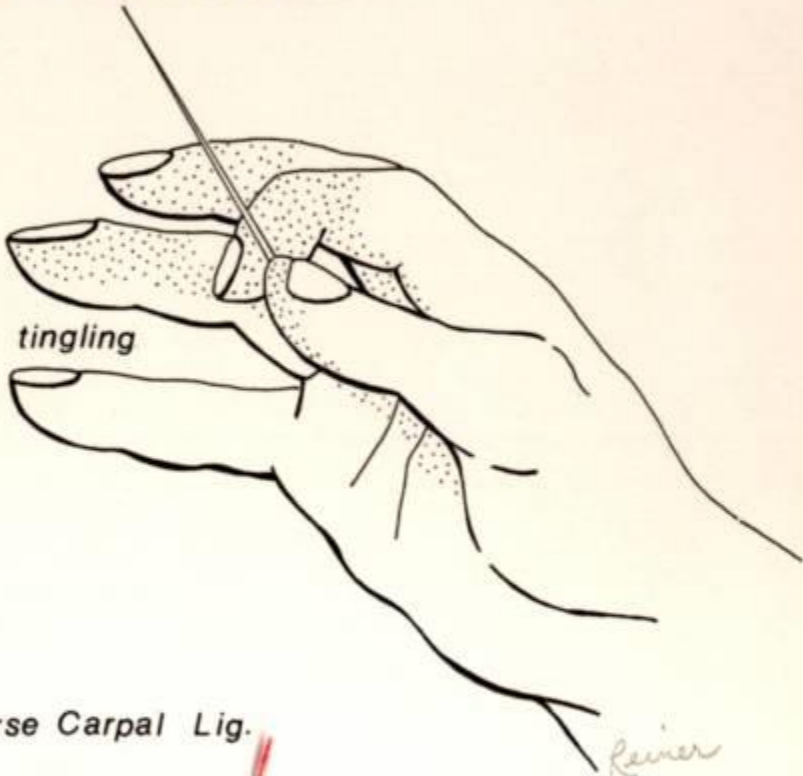
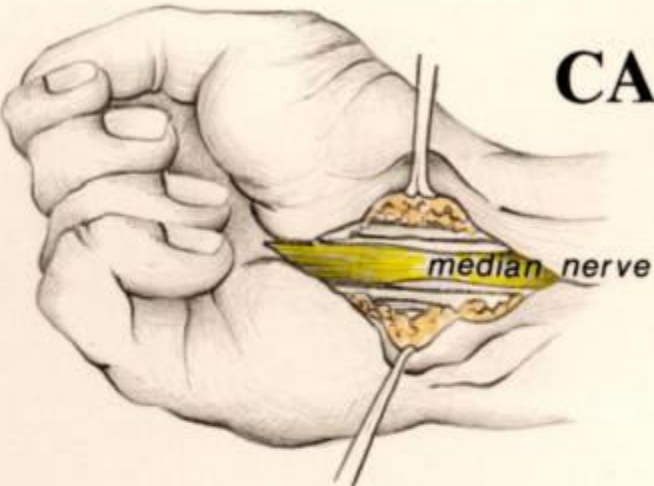
**Carpal tunnel:** The space in the center of the wrist containing the flexor tendons and the median nerve.

**Carpal bones:** A U-shaped cluster of eight bones at the base of the palm forms the floor and two sides of the tunnel.

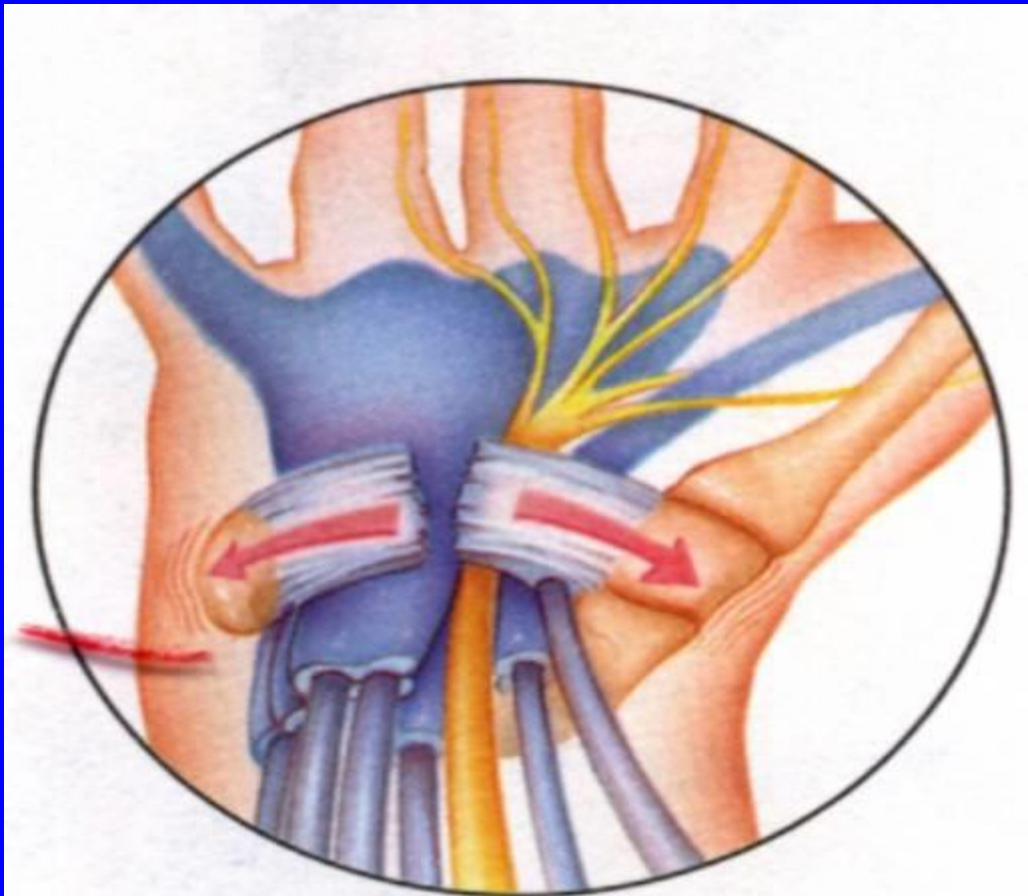
**Flexor tendons:** These tendons encircle the median nerve and form the major contents of the tunnel.



# CARPAL TUNNEL SYNDROME



# Surgical Release of Tunnel

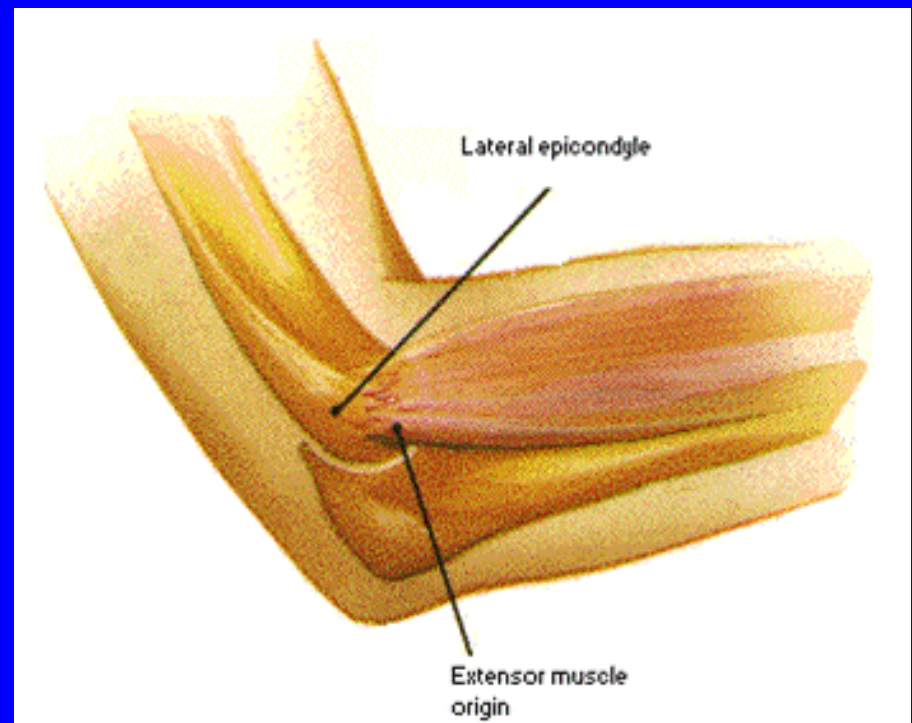


The ligament is released and the tunnel springs open, easing pressure on the nerve.

# Tennis Elbow Syndrome



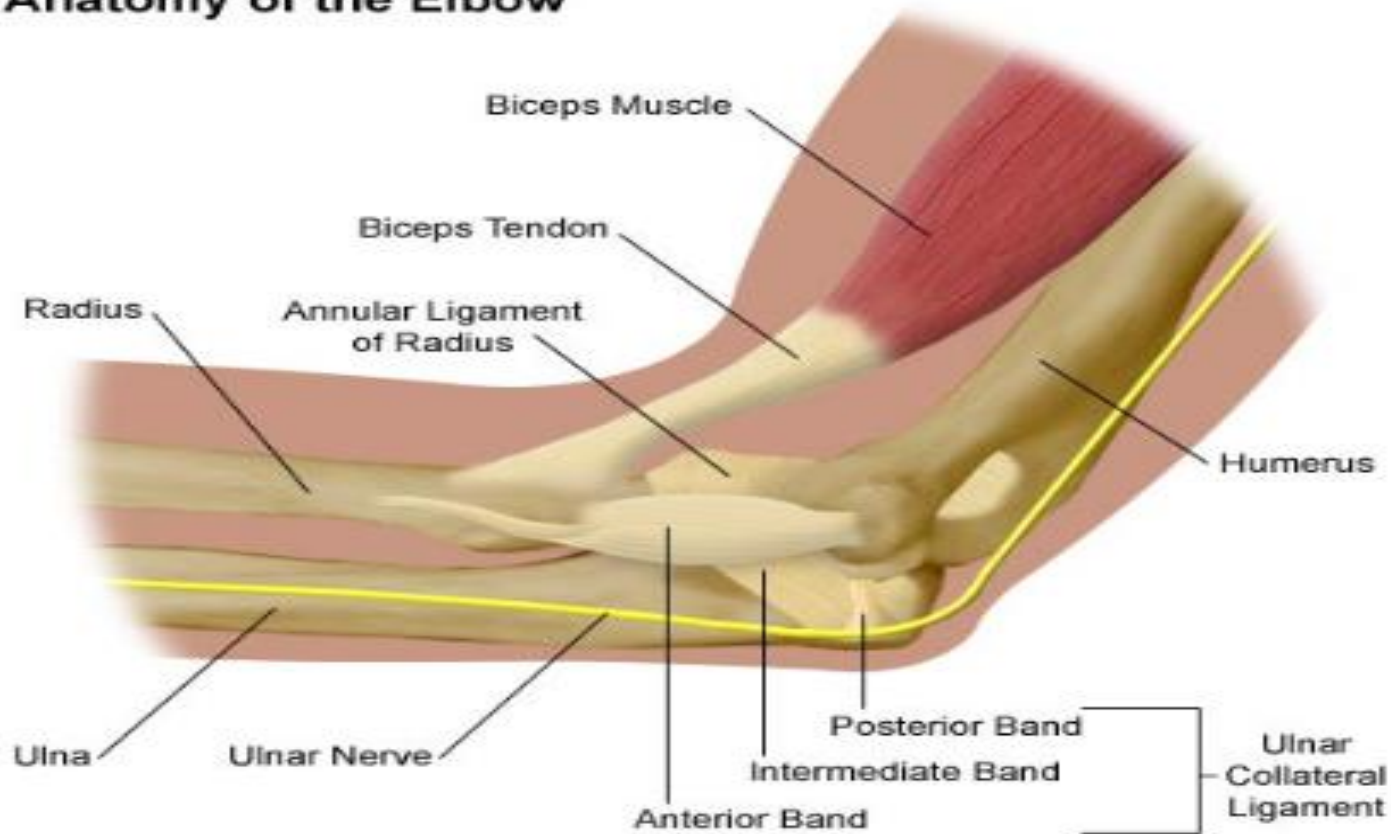
# Micro-tearing at the Elbow





# Cubital Tunnel Syndrome

## Anatomy of the Elbow

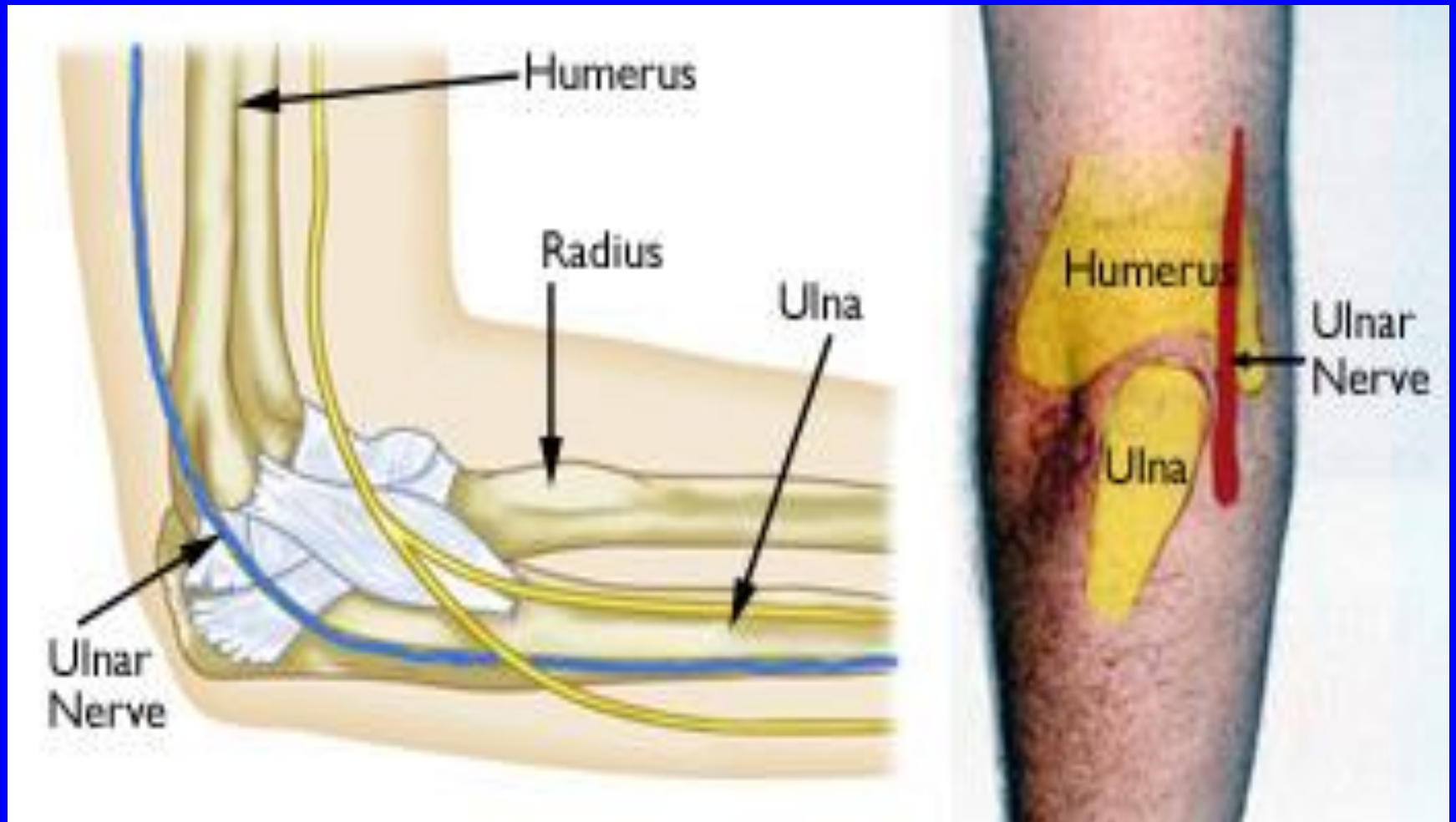




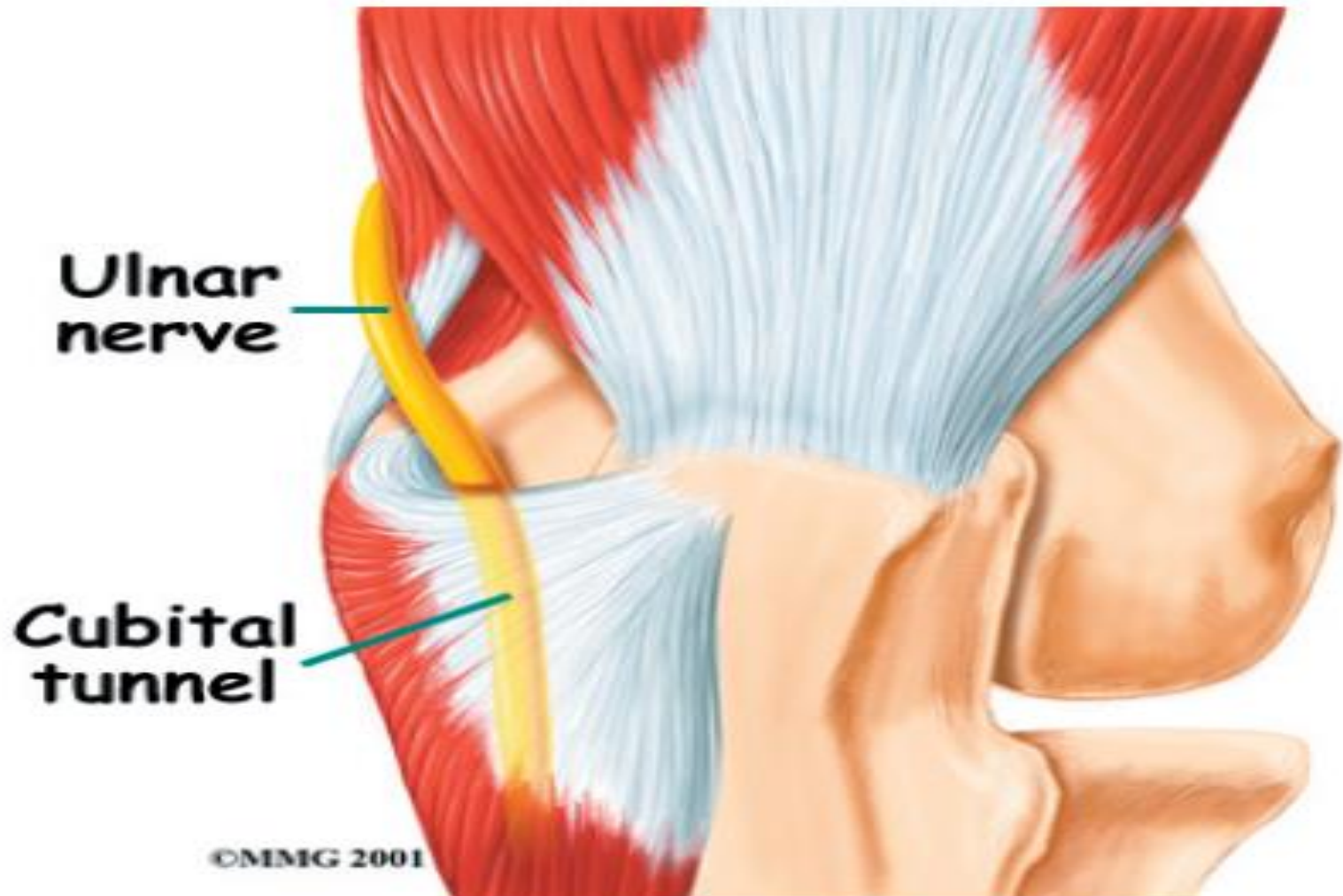
# Cubital Tunnel Syndrome



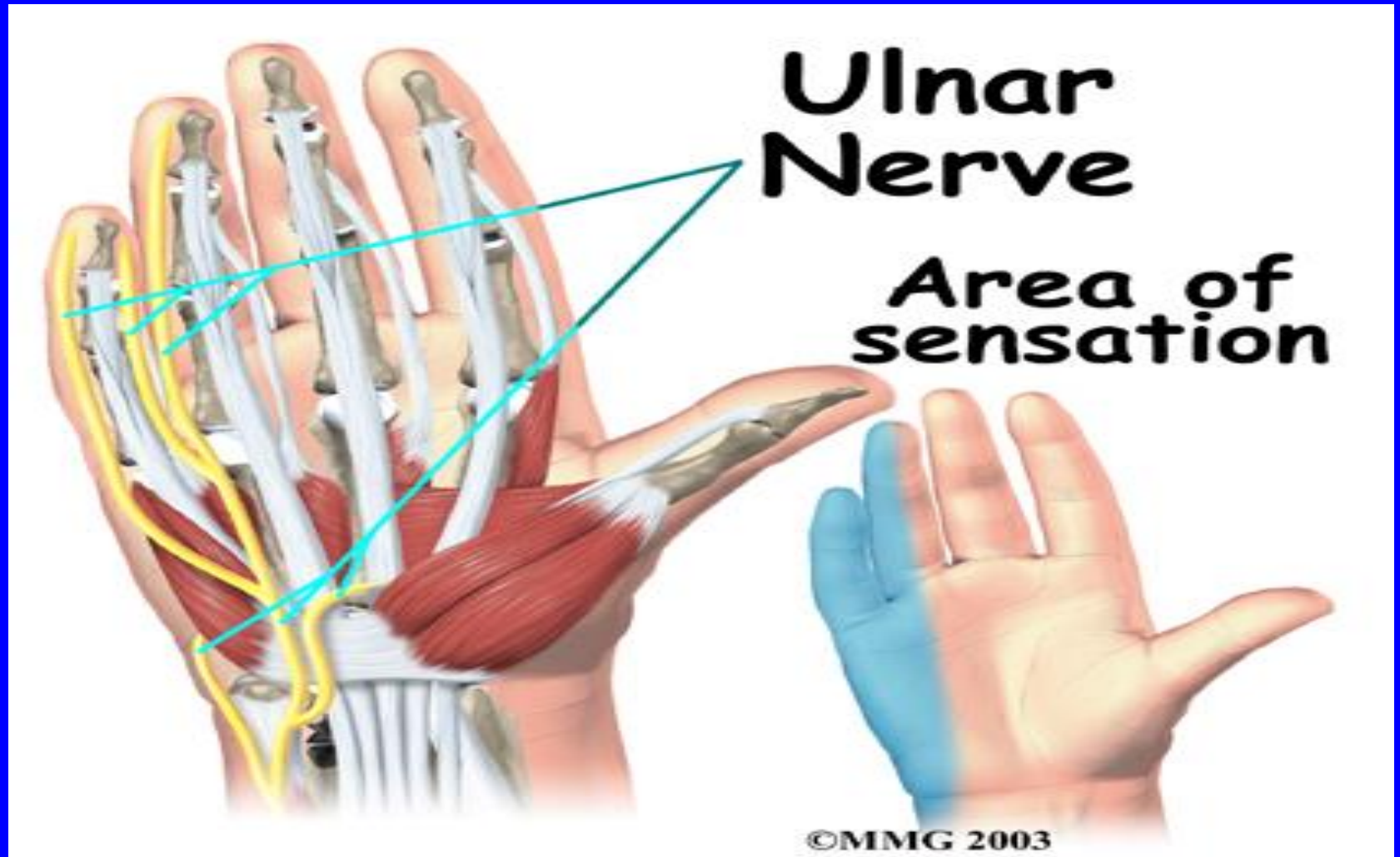
# Cubital Tunnel Syndrome



# Cubital Tunnel Syndrome

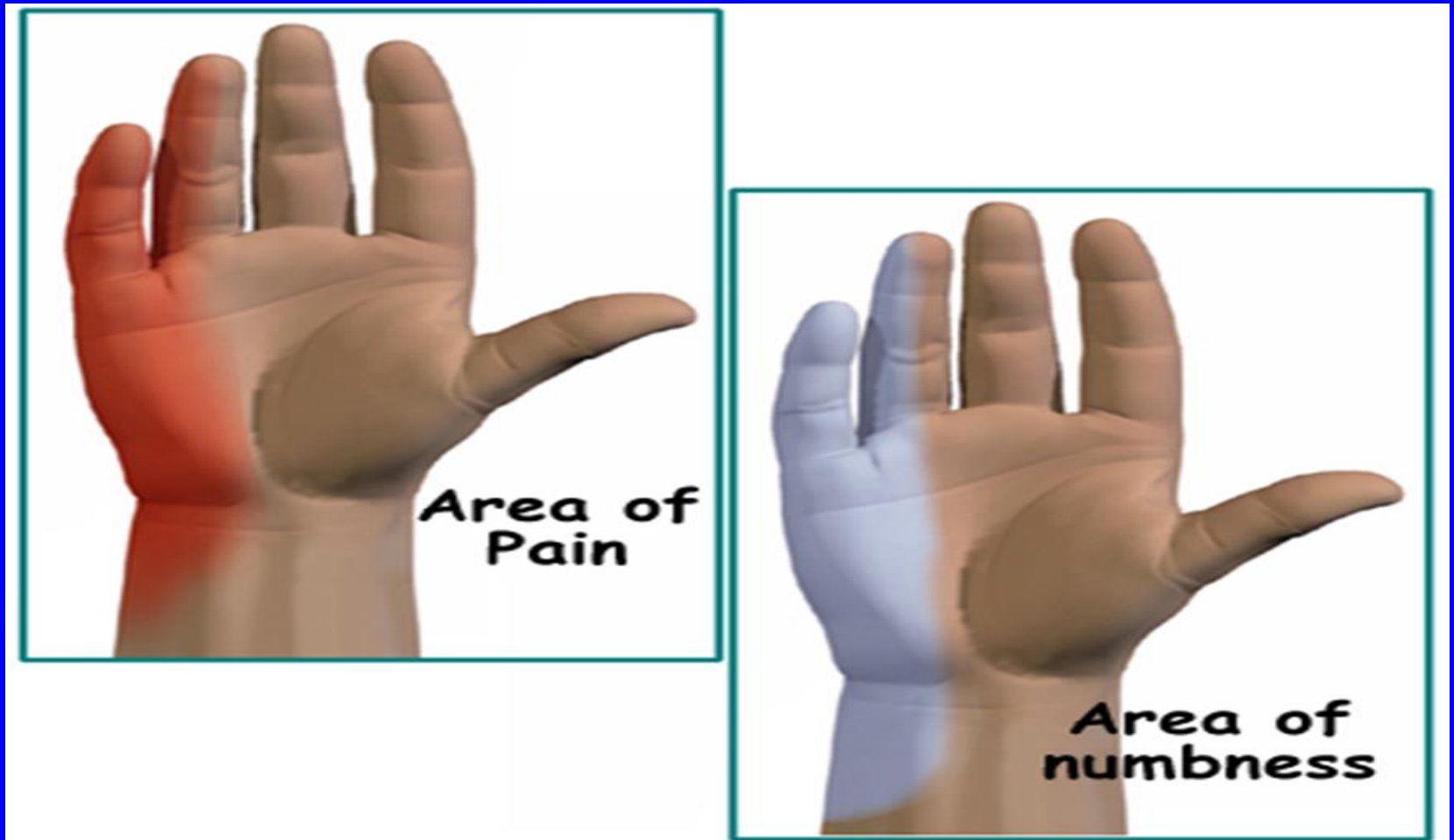


# Ulnar Nerve





# Cubital Tunnel Syndrome Symptoms





# Reynaud's Phenomenon or “White Finger”

- Caused by operating vibrating machinery – especially in cold, damp weather





# Hand-Arm Vibration



**"Hazard"**



# What are the Symptoms?



# Who is at Risk?



- Those with a disease that reduces blood flow
- **Workers in cold and damp conditions**



# Who is at Risk?



**Workers using  
vibrating tools**

**Workers in  
contact with cold  
tools**

# Prevention

**Low vibration tools**

**Use the right tool for the job**

**Tool maintenance**

**Reduce amount of time using the tool**

**Keep hands & handles warm**

**New approach to your job**

**Anti-vibration gloves**

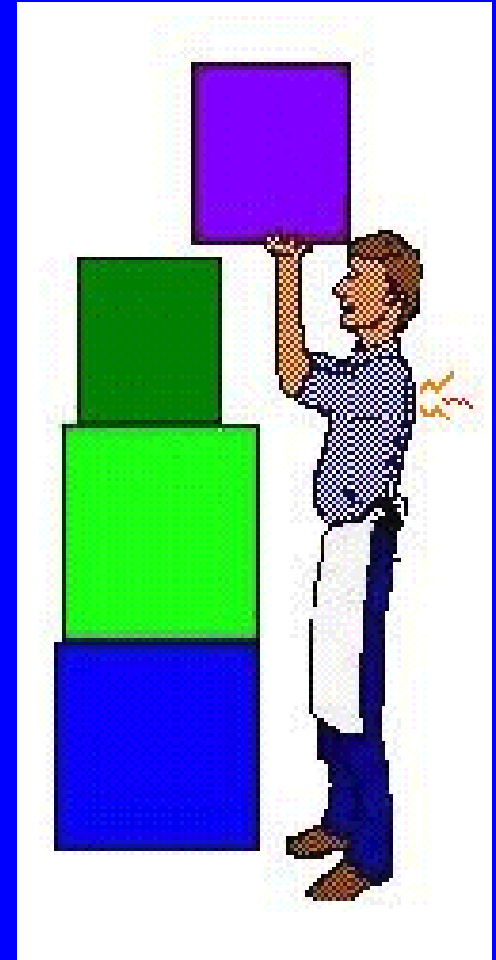
# Common Causes of Back Injuries

Twisting at the waist while lifting or holding a heavy load . . . this frequently happens when using a shovel



# Common Causes of Back Injuries

Reaching and lifting . . .  
over your head, across  
a table, or out the back  
of a truck . . . .



# Common Causes of Back Injuries

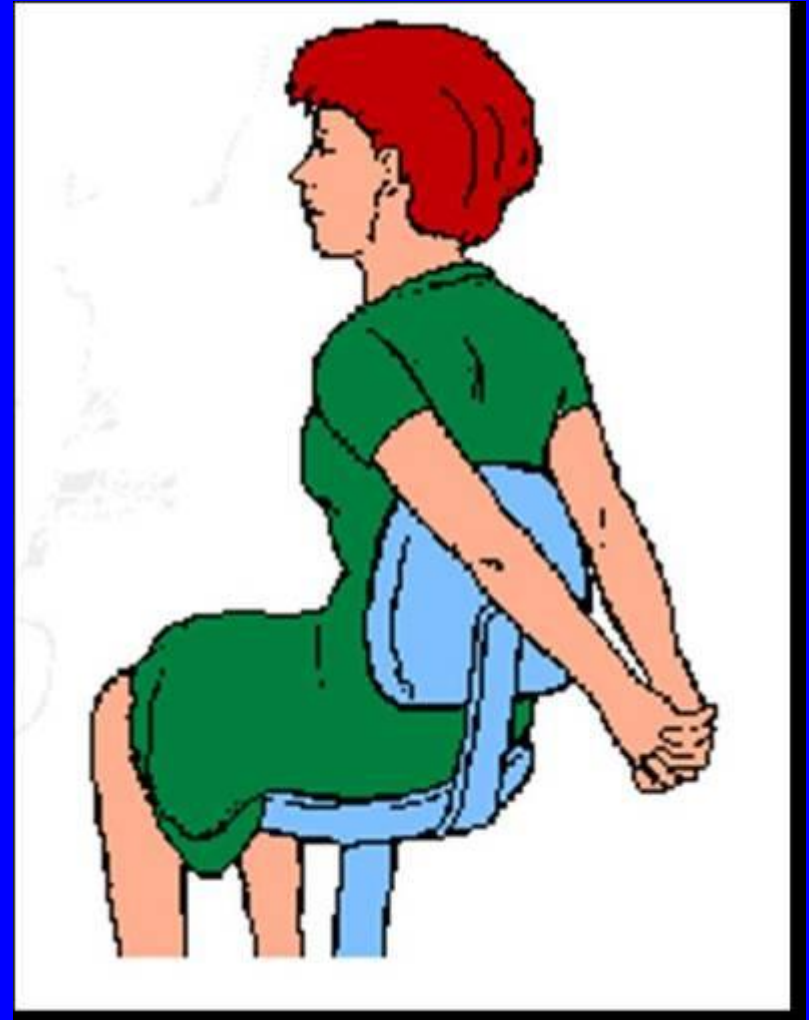
Working in awkward,  
uncomfortable positions . . .





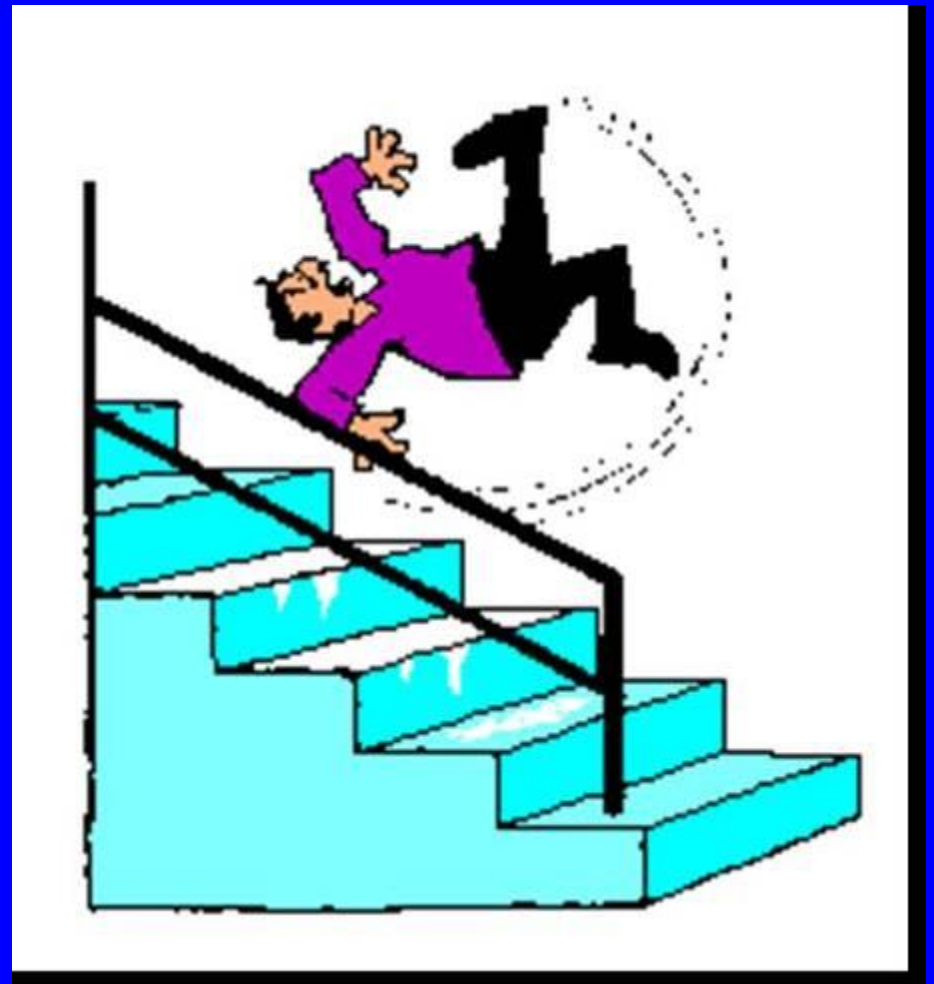
# Common Causes of Back Injuries

**Sitting or standing too long in one position . . . sitting can be very hard on the lower back . . . .**



# Common Causes of Back Injuries

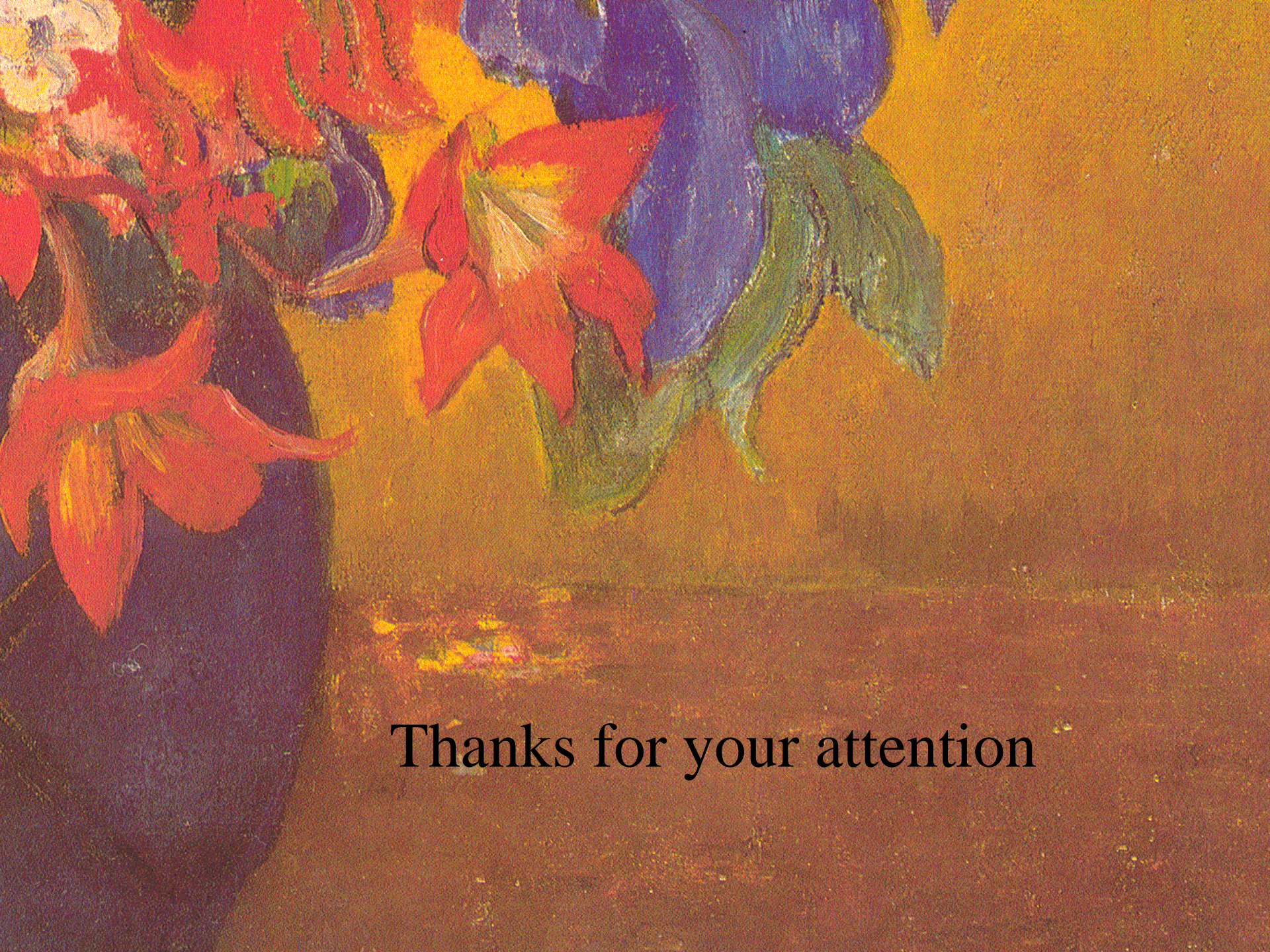
It is also possible to injure your back slipping on a wet floor or ice . . .



# Prevent Back Injuries

- Avoid lifting and bending whenever you can
- **Place objects up off the floor**
- Raise/lower shelves.
- **Use carts and dollies**
- Use cranes, hoists, lift tables, and other lift-assist devices whenever you can
- **Test the weight of an object before lifting by picking up a corner**
- Get help if it's too heavy for you to lift it alone





Thanks for your attention