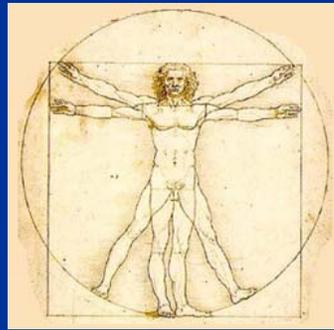


# Office Ergonomics: Preventing Office-Related Injuries



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# Overview

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- **Background on ergonomics**
  - Definition
  - Statistics
  - Regulatory Agencies & Laws
  - Types of work-related injuries
- **Common Anatomical & Associated Risk Factors**
- **6-Steps to Prevention work-related injuries**
- **Steps to take-if you experience work-related injury**

# At the conclusion of today's training you will be able to:

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- Identify at least **3 risk factors** that contribute to work related injuries.
- Perform a **self evaluation** of your own work environment.
- Describe at least 1 **change or modification** that you intend to make to your workstation, job or work habits.



# What is Ergonomics?

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- **ERGO** = Work
- **NOMICS** = “rules” or “laws”
- **Ergonomics**: Means “the laws of work”

# What is Ergonomics?

- The science of “**designing the job to fit the worker**, rather than forcing the worker to fit the job” (OSHA)
- Ergonomic principles are used to **improve the “fit”** between the worker and the workplace.
- A practical approach to Ergonomics considers the **match between the person, the equipment they use, the work processes, and the work environment.**

# Outcome of Ergonomics

## Overall, Ergonomic Interventions:

- Makes the job safer by preventing injury and illness
- Makes the job easier by adjusting the job to the worker
- Makes the job more pleasant by reducing physical and mental stress
- Saves \$\$\$\$

# Occupational Injury Statistics

Ergonomic injuries account for one-third of all workplace-related injuries



- 600,000 office workers each year miss at least one day of work due to ergonomic injuries (U.S. Department of Labor (2005))
- Cost of ergonomic injuries to employees, employers, and society as a whole: **\$50 billion annually** (National Research Council/Institute of Medicine, 2001)

# Regulatory Agencies

## Work-Related Injury & Prevention

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### Occupational Safety and Health Act of 1970

National Institute for Occupational Safety and Health (NIOSH) - U.S. Department of Health and Human Services



- Responsible for conducting research and making recommendations for the prevention of work-related injury and illness.

Occupational Safety and Health Administration (OSHA) in the U.S.  
Department of Labor



- Responsible for developing and enforcing workplace safety and health regulations.

# Regulatory Agencies

## Work -Related Injury & Prevention

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The State of California Division of Occupational Safety and Health (DOSH) - referred to as Cal/OSHA



- Responsible for enforcing California laws and regulations pertaining to workplace safety and health and for providing assistance to employers and workers about workplace safety and health issues.

# Ergonomic Laws (National)

## OSHA Act of 1970, Section 5 (a) (1)

- An **employer** “...shall furnish a place of employment which is **free from recognized hazards** that are likely to cause death or serious physical harm to employees.”

# Ergonomic Laws (California)

## California Code of Regulations, Section 5110 (Repetitive Motion Injuries, 1997)

- **Employers shall establish a program to reduce RMI's**
  - **Worksite evaluation**
  - **Control of exposures that cause RMI's through engineering and administrative controls.**
  - **Employee training**
    - **RMI exposure**
    - **Symptoms and consequences**
    - **Reporting procedures**
    - **Methods to reduce RMI's**

# Ergonomic-Related Injuries

## May be called:

- CTD's (cumulative trauma disorders)
- RSI's (repetitive stress injuries)
- RMI's (repetitive motion injuries)

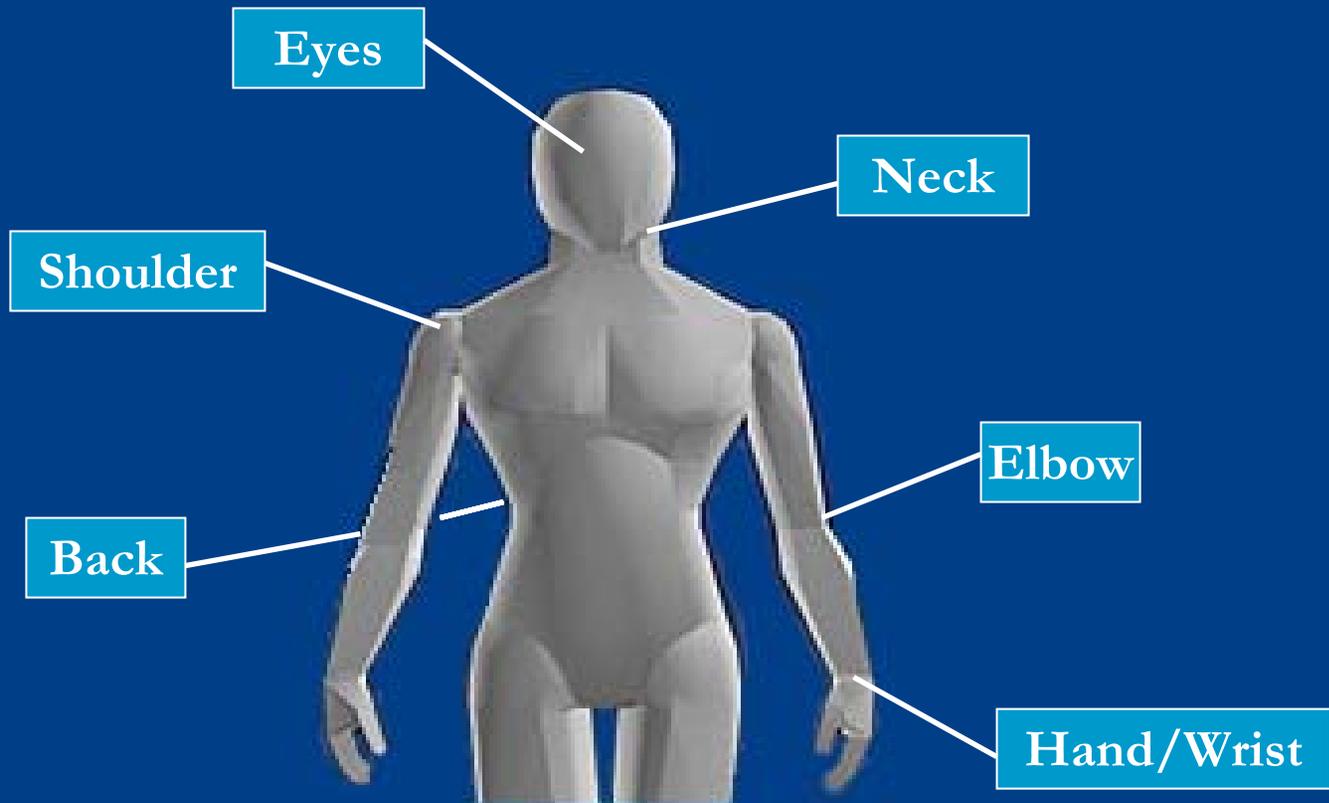
## Which are all considered

- MSD's (musculoskeletal disorders)
- MSD's can affect muscles, tendons, nerves, joints and spinal disks.

# Risk Factors and Causes of MSD's

- **Repetitive, frequent movements**
- **Excessive force** (pinch-grip of hands and fingers)
- **Awkward Posture** - deviation from the “neutral” body position
- **Static Posture** - posture occurs when one position is held for a prolonged period of time. The muscles will become fatigued from a lack of blood flow during a static posture
- **Contact Stress** - Caused by repetitive motion that created localized pressure point such as on finger tip or thumb. This irritates local tissues and interfere with circulation and nerve function.
- **Psycho Social** - Stress, boredom, clutter, job dissatisfaction and anxiety can contribute to the possibility of developing a MSD. This stress also creates increased muscle tension and reduce a person's awareness of work technique.

# Common Anatomical Risks of MSD's



# Back-Related MSD's

## Symptoms

- Muscular tension
- Low back pain
- Reduced range of motion



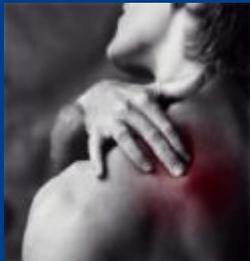
## Risks

- Awkward sitting position
- Static position
- Prolonged sitting
- Lumbar not supported
- Chair backrest not used
- Twisting of torso
- Feet dangling-not flat on floor

# Shoulder-Related MSD's

## Symptoms

- Muscular tension
- Stiffness
- Reduced range of motion



## Risks

- Prolonged Shoulder Abduction (elbows rested outward on arm rest)
- Elbows hanging (not using arm rest)
- Prolong Raised Shoulder Flexion (elbows forward)
- Prolong Shoulder Hunched position (shoulders up around ears)
- Static position

# Eye-Related MSD's

## Symptoms

- Sore, tired, itchy, dry, or burning eyes
- Headaches
- Difficulty focusing between monitor and documents
- Increased sensitivity to light
- Color fringes/after images



## Risks

- Improper viewing, height, angle, and distance
- Improper lighting
- Glare
- Uninterrupted focus on the screen
- Hard copy document location
- Dirty screen
- Type of reading glasses
- Screen contrast between screen and hard copy document

# Neck-Related MSD's

## Symptoms

- Muscular tension
- Stiffness
- Reduced range of motion



## Risks

- Twisting head from side to side to read hard copy documents
- Head tilted slightly back
- Neck severely flexed downward

# Elbow-Related MSD's

## Symptoms

- Pain
- Swelling
- Stiffness
- Reduced grip strength in hand



## Risks

- Elbow or forearm resting for long periods on hard or sharp work surface, chair armrests, etc.
- Elbow flexed for long period while using mouse or keyboard
- Forceful Repetitive movements of wrist and arm
- Forceful Repetitive hand grip

# Hand/wrist-Related MSD's

## Symptoms

- Pain
- Swelling in joints
- Stiffness in joints
- Numbness or burning sensation in the hand or fingers
- Reduced grip strength in hand



## Risks

- Rapid, sustained, or prolonged keying
- Forceful key strokes or exertions
- Prolonged mouse use
- Wrists bent back (extended) or forward (flexed) for prolonged periods

*Continued...*

# Hand/wrist-Related, continued



## Risks

- Wrists angled to the side when using side keys
- Wrists or palms resting for long periods on hard surface
- Keyboard and mouse not positioned correctly

# Types of Musculoskeletal Disorders (MSD's)

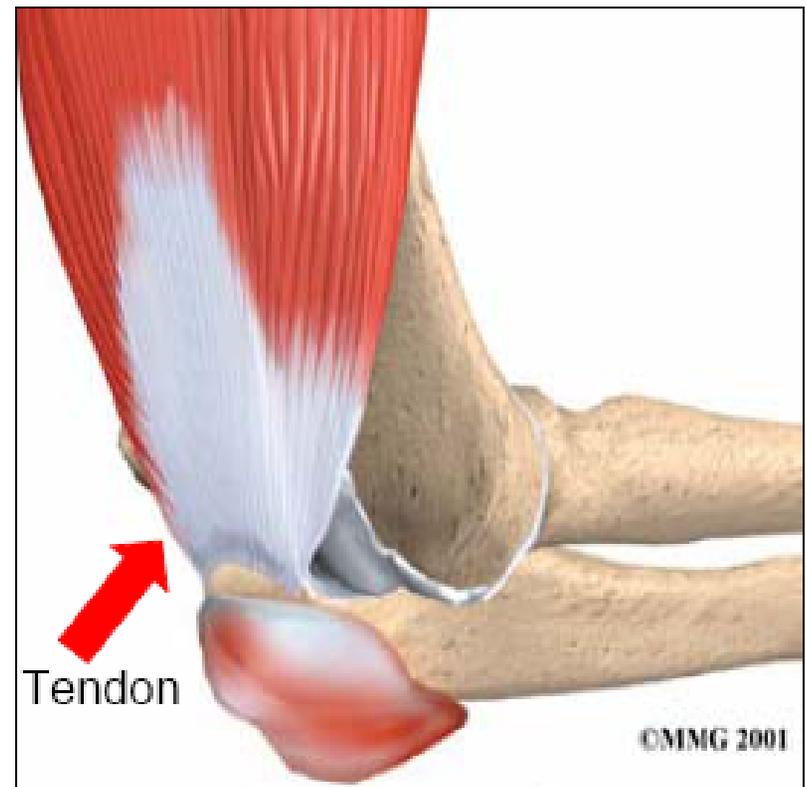
- Tendonitis
- Bursitis
- Tennis Elbow
- Trigger finger
- Thoracic Outlet Syndrome
- *Carpal Tunnel Syndrome*
- Other Types:
  - Sprains & Strains
  - Neck & Back Injuries

# Tendonitis

- Inflammation of tendon-thick cord that attaches bone to muscle
- Common Office Related Anatomical Location: **Elbow & Shoulder**
- Cause: **Repetitive motion**

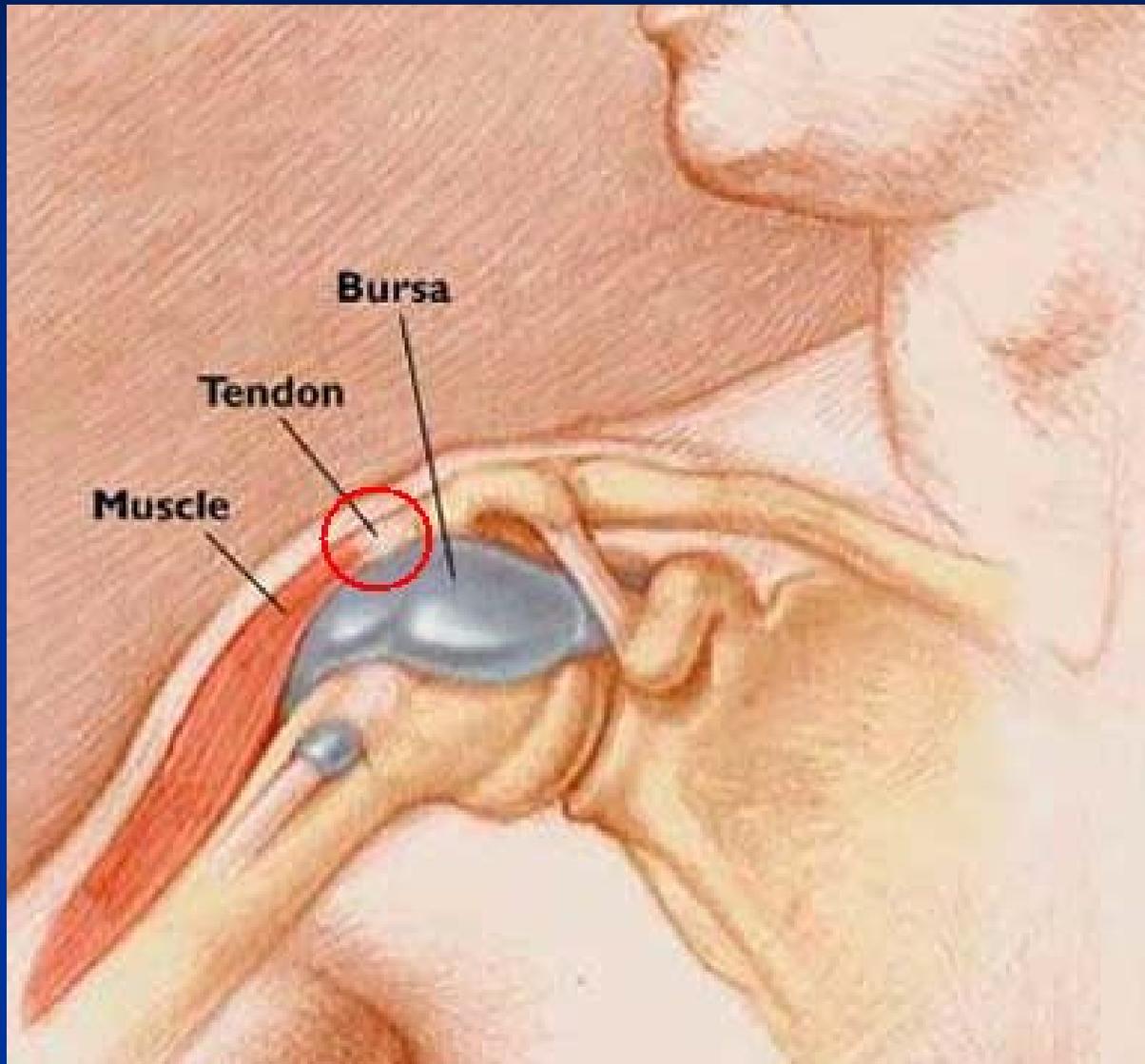


Normal



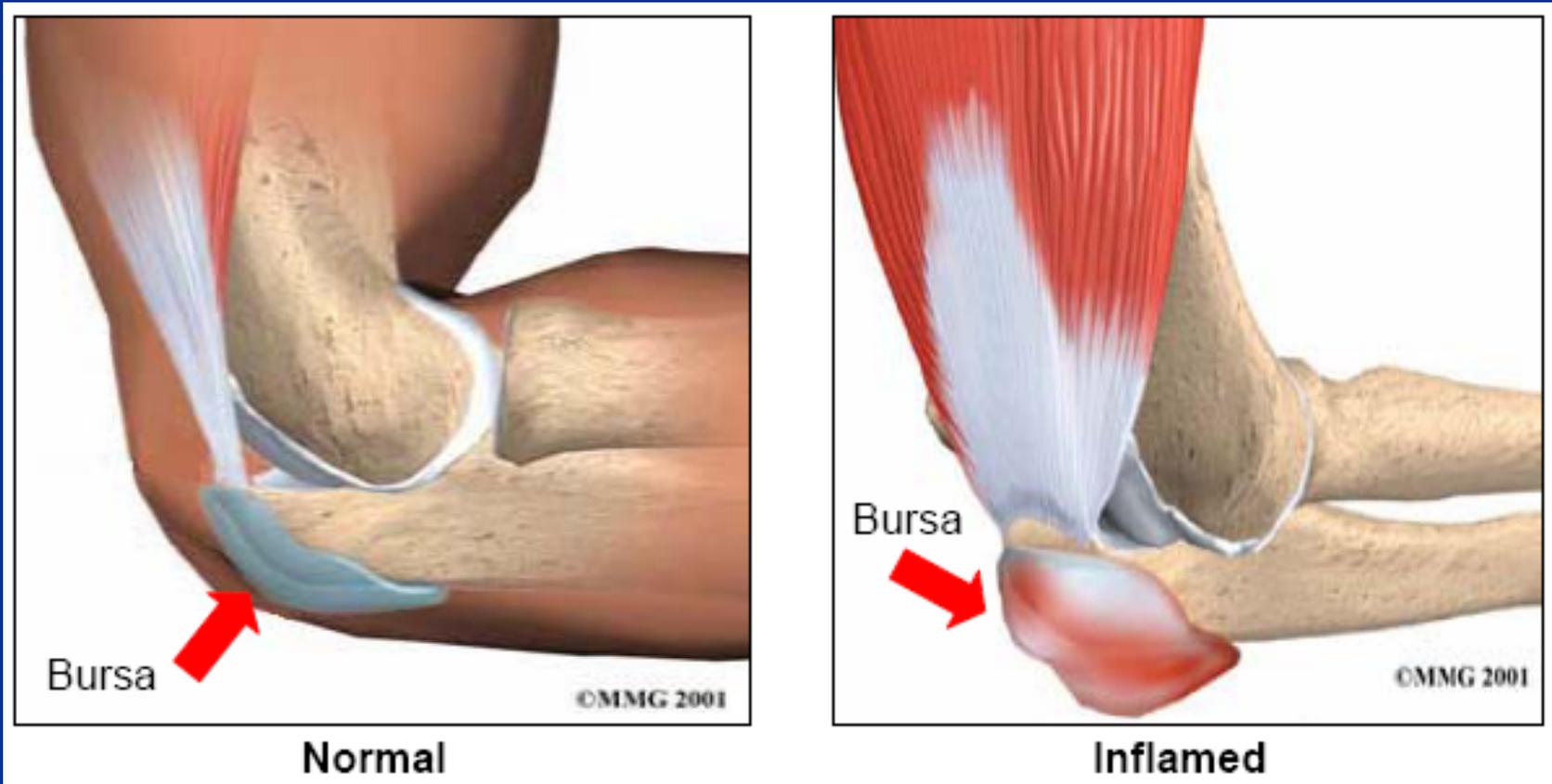
Inflamed

# Tendonitis-Shoulder

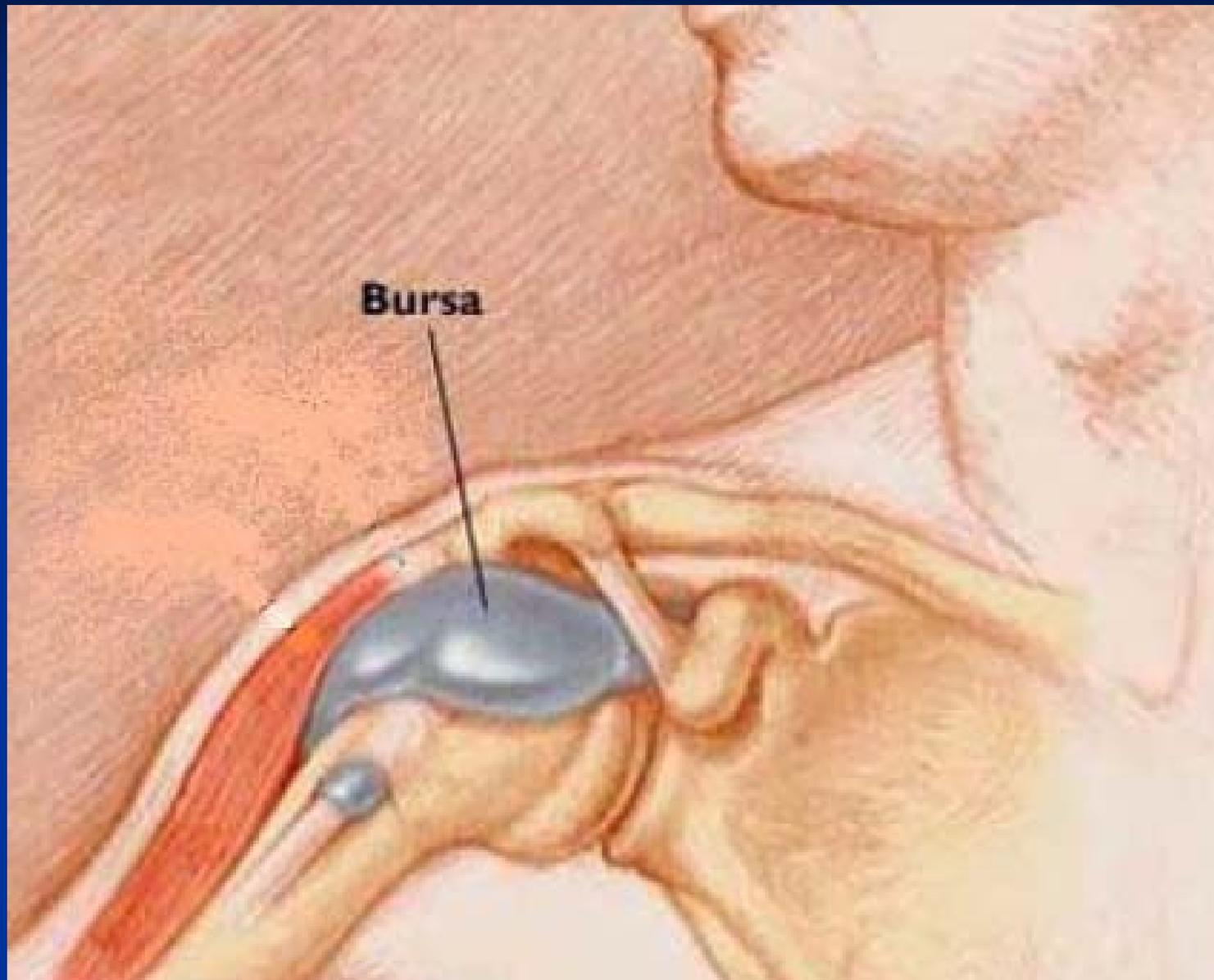


# Bursitis

- Inflammation of one of bursa sacks (fluid filled sack-like structures diminish friction between two moving structures)
- Common Office Related Anatomical Location: **Elbow & Shoulder**
- Cause: **Repetitive motion & overuse**

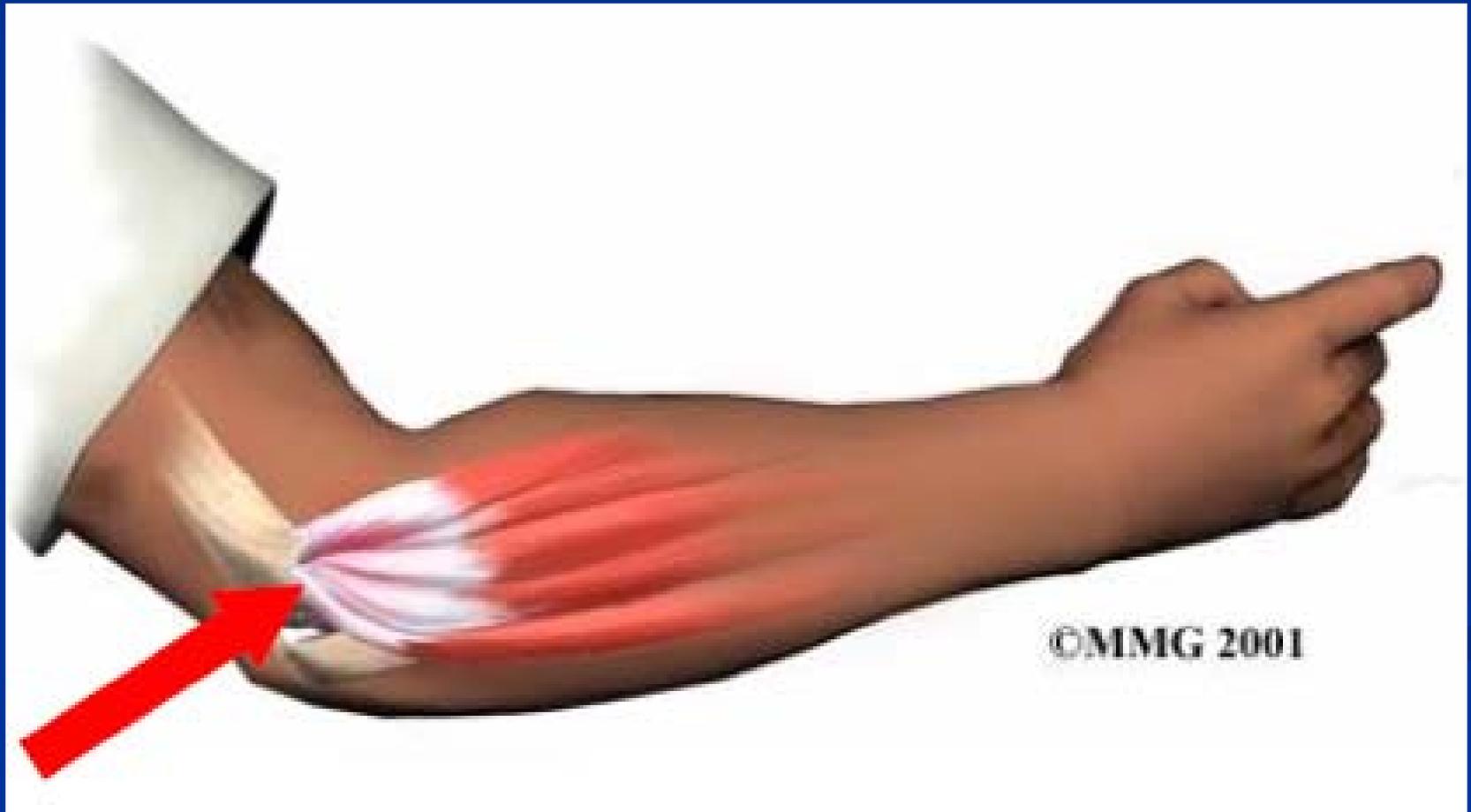


# Bursitis-Shoulder



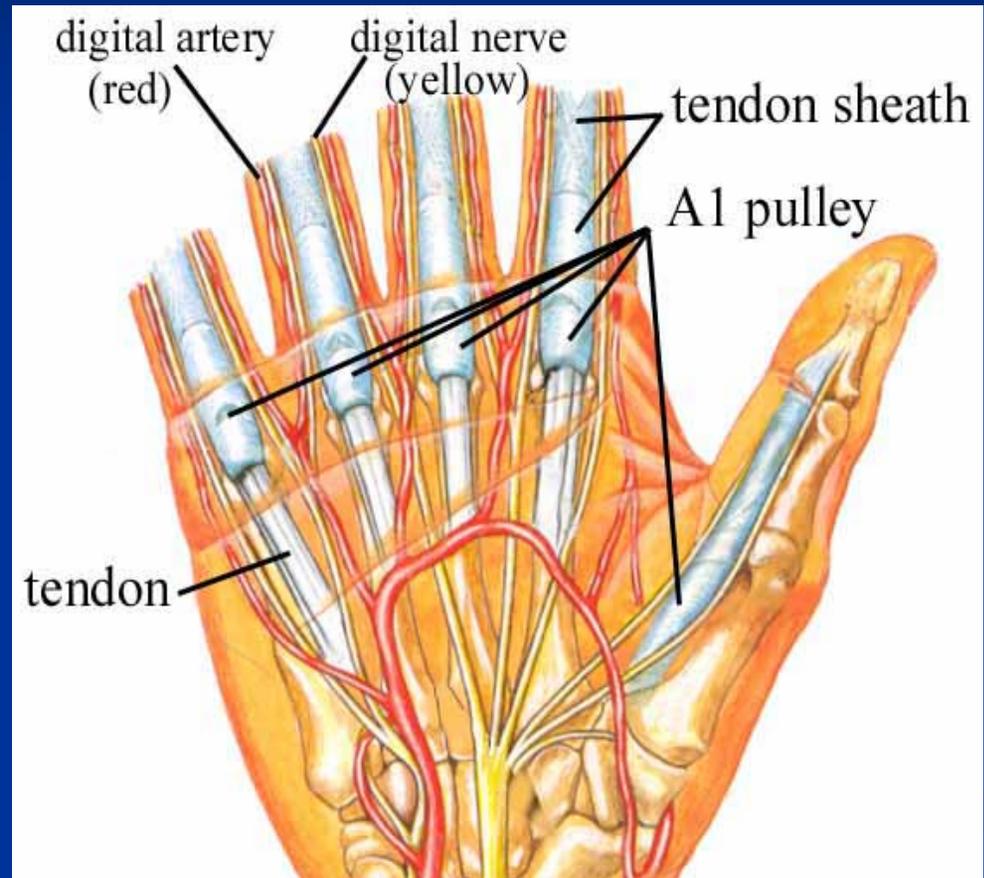
# Tennis Elbow (lateral epicondylitis)

- Inflammation of the tendons outside (lateral side) of the elbow
- Cause: Repetitive motion of wrists or repetitive gripping

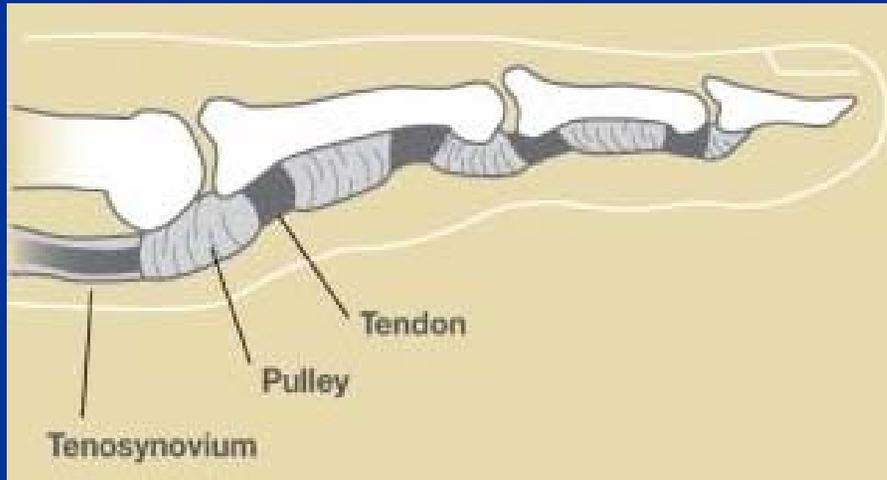


# Trigger Finger (Stenosing Flexor Tenosynovitis)

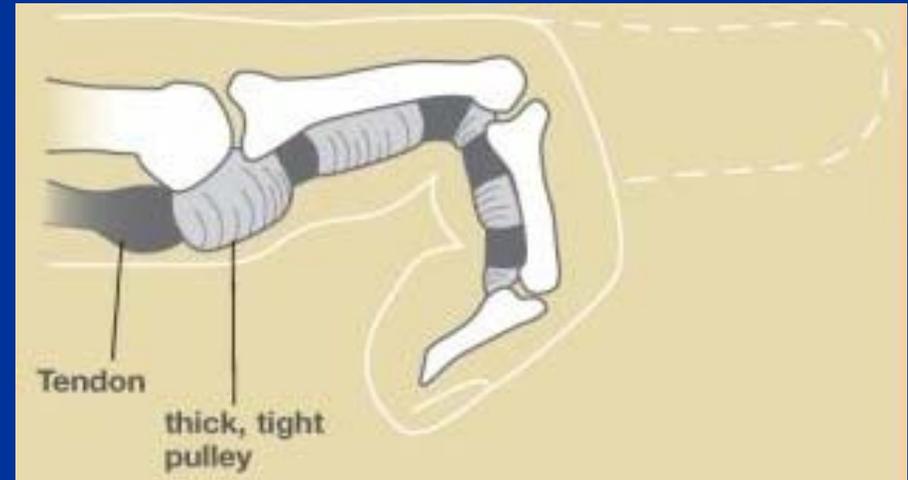
- Inflammation of A1 pulley
- Cause: Repetitive, forceful, and frequent squeezing or gripping



# Trigger Finger (Stenosing Flexor Tenosynovitis) Cont'd



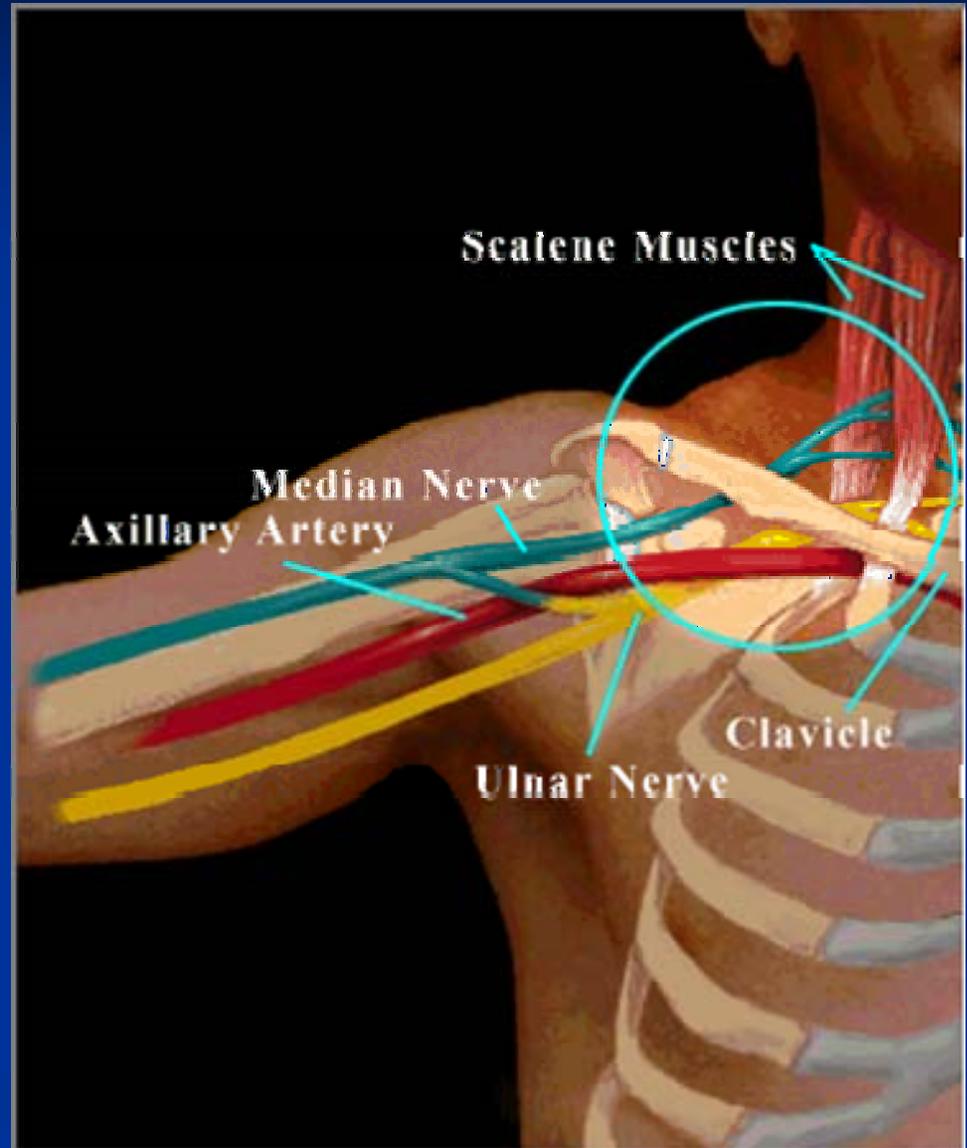
**NORMAL ANATOMY**



**ABNORMAL ANATOMY**

# Thoracic Outlet Syndrome

- Compression of the nerves and blood vessels in the thoracic outlet (space between clavicle and first rib).
- Symptoms:
  - Pain in shoulders and neck
  - Numbness in fingers
- Cause: Repetitive motion & poor posture



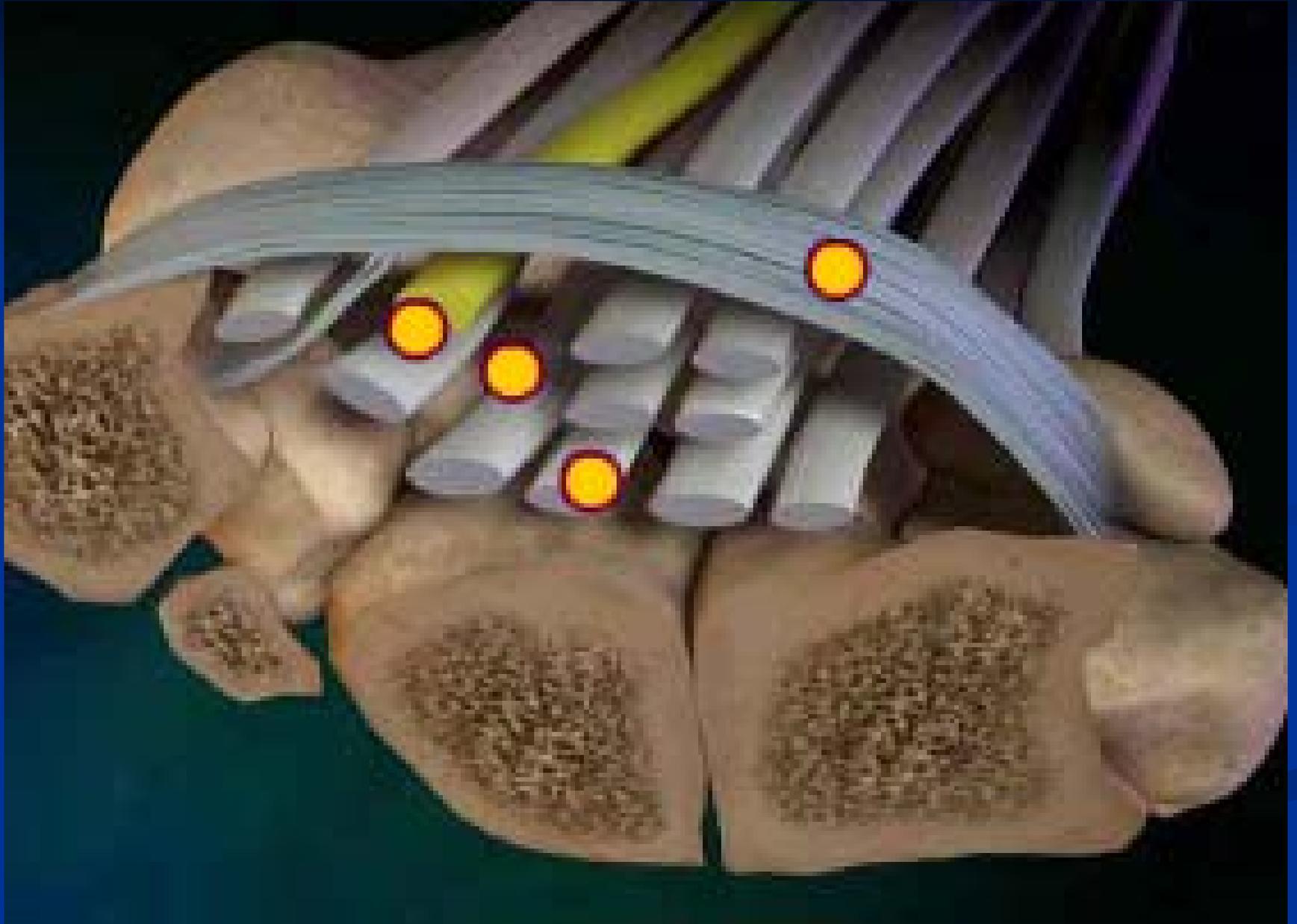
# Carpal Tunnel Syndrome

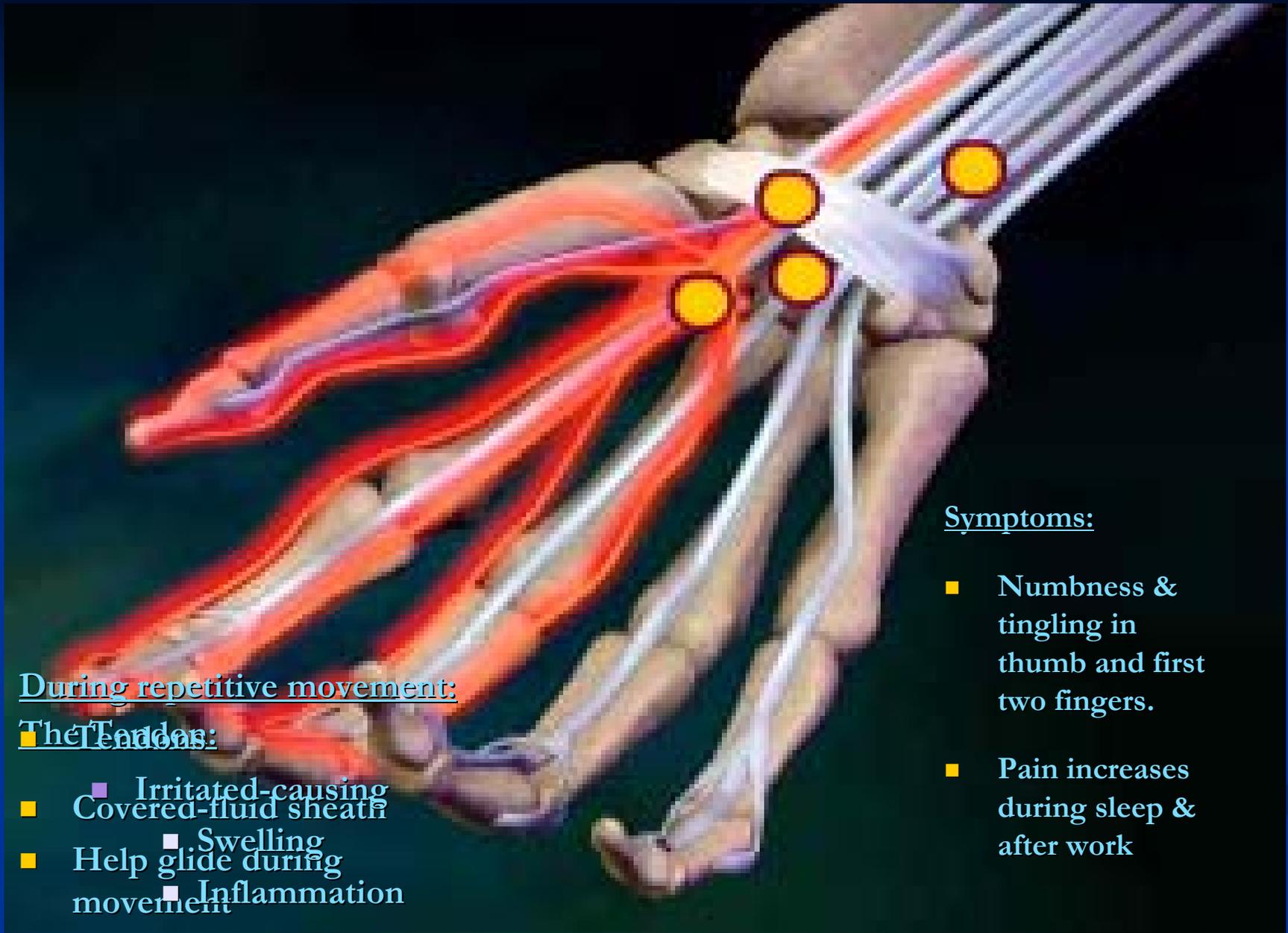




### Carpal Tunnel:

- **Narrow, C-shaped passageway**
- **Made of tiny bones and ligaments**
- **Tendon and nerves**
  - Control movement to fingers
  - Pass through the carpal tunnel





During repetitive movement:

The Tendons:

- Irritated-causing
- Covered-fluid sheath
- Swelling
- Help glide during
- Inflammation
- movement

Symptoms:

- Numbness & tingling in thumb and first two fingers.
- Pain increases during sleep & after work

# Preventing MSD's

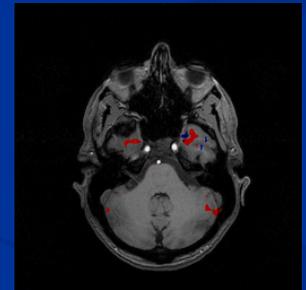
By applying ergonomic principles to the office setting:

- **Risk factors** are minimized
- **Productivity** is increased and
- **Workplace quality** is improved

# Preventing MSD's

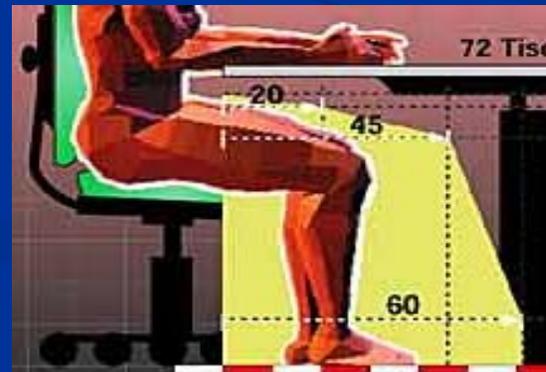
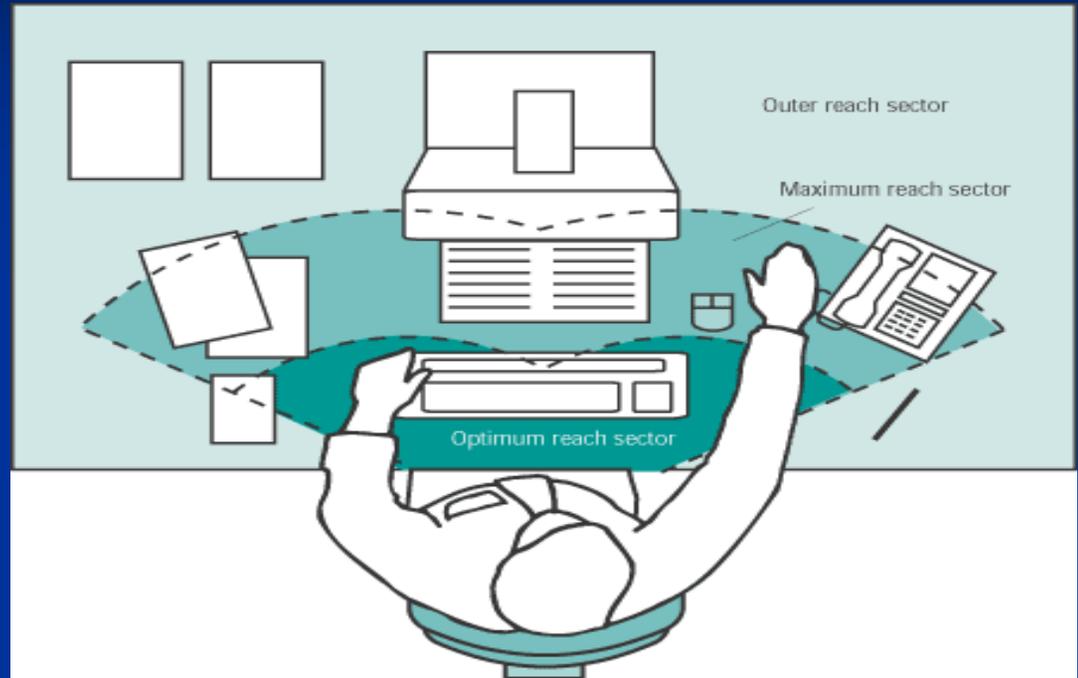
## Ergonomic principles: 6-Steps to Preventing MSD's:

- Adjust workstation to promote a neutral position that fits you and makes you feel most comfortable.
- When adjusting your workstation-remember-All of the equipment interacts with your body and actions-making one adjustment may alter another. *Remember:*
  - **THINK**-type of adjustment to be made
  - **ADJUST**-make adjustment
  - **FEEL**-your body/if no improvement, then **RE-ADJUST**



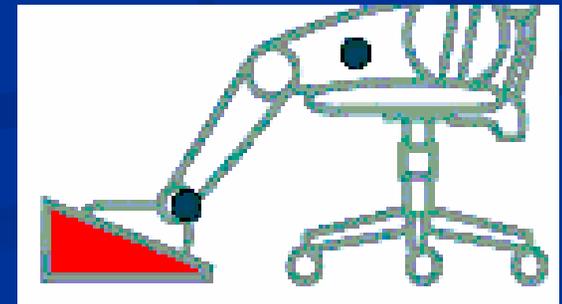
# STEP 1. Workstation Area

- **Organize Desktop** - to keep frequently used items within easy, limited reach
- **Clear any clutter** - to have space when working
- **Area under desk** – clear of clutter to accommodate legs & allow for stretching



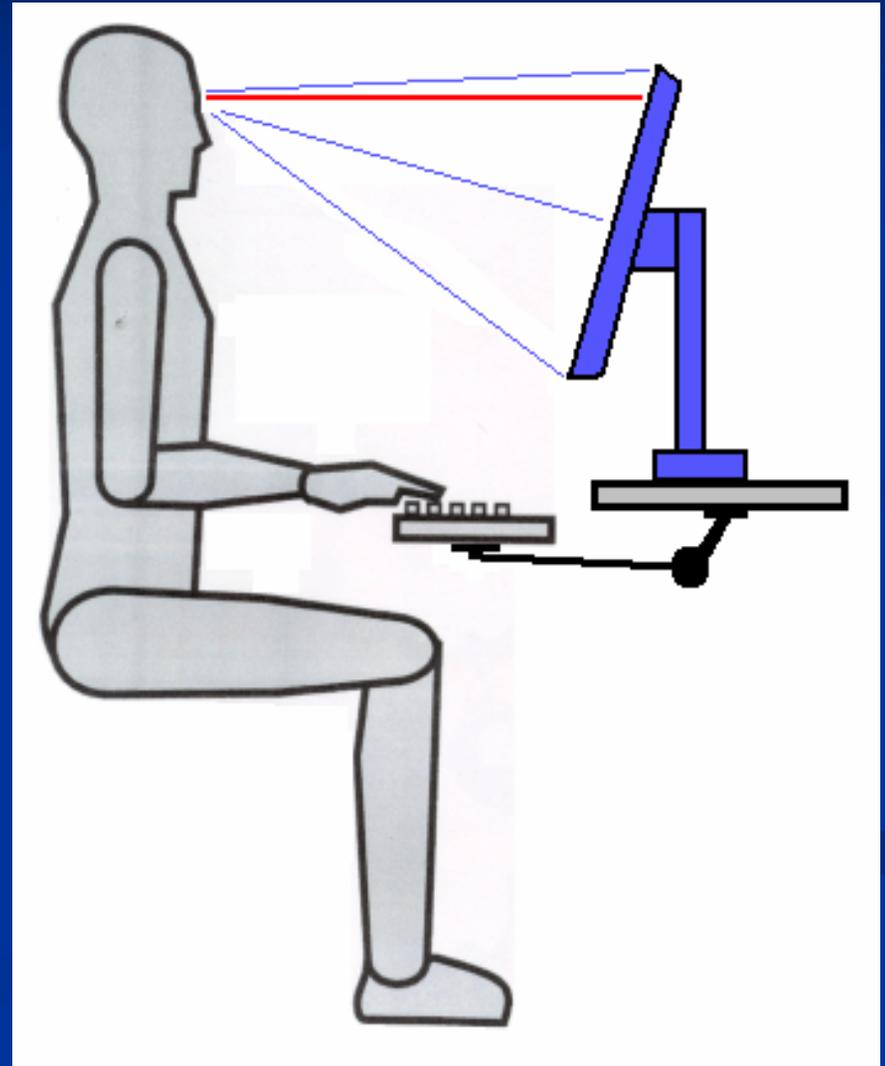
# STEP 2. Chair Adjustment-Posture

- Hands, wrists, and forearms are straight, in-line, parallel to the floor.
- Head is level, or bent slightly forward, forward facing, and balanced. Generally it is in-line with the **torso**.
- Shoulders are relaxed, **upper arms** hang normally at the side of the body.
- Elbows stay in close to the body and bent between 90 and 120 degrees, resting on armrest.
- Back is fully supported with lumbar when sitting vertical or leaning back.
- Thighs and hips are supported by well-padded seat, parallel to the floor.
- Knees are about the same height as the hips with **feet** slightly forward.
- Feet are fully supported by floor or footrest.



# STEP 3. Monitor Adjustment

- Your eyes should be level with the top of monitor
- Distance between the eyes and monitor - not less than 20-inches away or not less than arm length
- The monitor should be tilted upward slightly
- Reduce glare from lights or windows
- Have document holder next to computer monitor



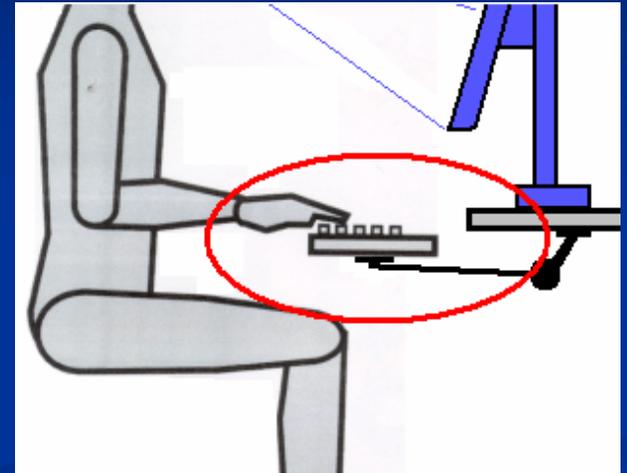
# STEP 4. Keyboard/Mouse

## KEYBOARD

- The keyboard should be directly in front of you.
- Your shoulders should be relaxed and your elbows close to your body.
- Your wrists should be straight and in-line with your forearms

## MOUSE

- Keep mouse close to keyboard
- Alternate hands with which you operate the mouse
- Learn to use keyboard short cuts to reduce extended use



# STEP 5. Workstation Environment

Be aware of, and try to limit:

- Glare from overhead lights, desk lamps, and windows
- Poor air circulation
- Air conditioning vents that "dump" air right on top of you

Consider Ergonomic Products to help fit the work environment to you

# Ergonomically Designed Office Equipment



# Ergonomically Designed Household Tools and Products



# STEP 6. Consider New Ergonomic-Friendly Work Habits

- When working for long periods of time on the computer, every 20-30 minutes take a short 1-minute routine break:
  - Remove eyes from screen (see handout in folder)
  - Stretch hands, arms, and back (see handouts in folder)
- Get regular exercise outside the office. Increase physical activities (walking, biking, social club) to help reduce stress

# Ergonomic Assessment & MSD Symptoms?

What to do if you need an ergonomic assessment or begin to experience MSD symptoms:

## ■ Ergonomic Self-Assessment

- <http://ergo.human.cornell.edu/cuergotipsintro.html>

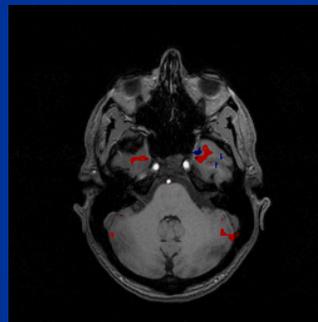
## ■ MSD Symptoms

- [http://www.lapublichealth.org/ivpp/injury\\_topics/OccupationalInjury/OfficeInjury.htm](http://www.lapublichealth.org/ivpp/injury_topics/OccupationalInjury/OfficeInjury.htm)
- **See your Doctor**
- **Request formal ergonomic assessment (contact IVPP)**
  - Give “Ergonomic Assessment Request” to your supervisor
  - Submit to IVPP

# Summary

*Remember:*

- THINK - type of adjustment to be made
- ADJUST - make adjustment
- FEEL - your body/if no improvement, then RE-ADJUST



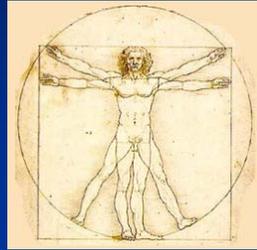
# Summary

## 6-Steps to Preventing MSD's

1. Keep frequently used items in easy reach & clear clutter
2. Adjust chair for neutral posture-feet flat on floor, appropriate height, arm rests adjusted, lumbar support
3. Adjust top of monitor to eye level and not closer than arms reach
4. Ensure keyboard is in front of you, located so shoulders are relaxed and elbows close to body, and wrists straight in-line with forearms. Ensure mouse is next to keyboard
5. Reduce glare & ensure proper lighting
6. Take routine 1-minute eye and stretch breaks every 20-30 minutes of computer work and increase physical activity to help reduce job stress

# Contact Information

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**Ergonomic Resource:**

<http://www.lapublichealth.org/ivpp>

**Email:**

[jdecarli@ladhs.org](mailto:jdecarli@ladhs.org)

**Phone:**

**(213) 351-7888**