

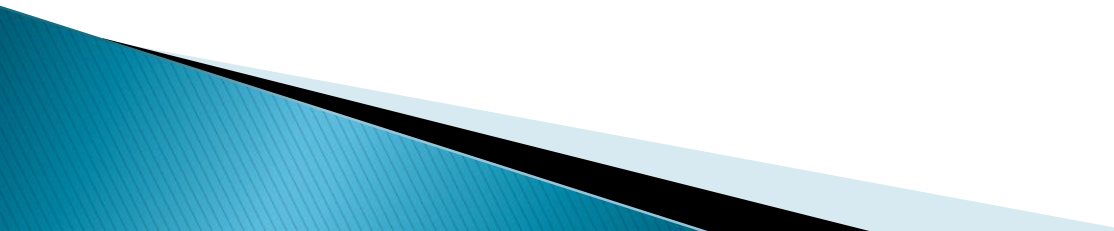
CTD

بیماری های اسکلتی عضلانی

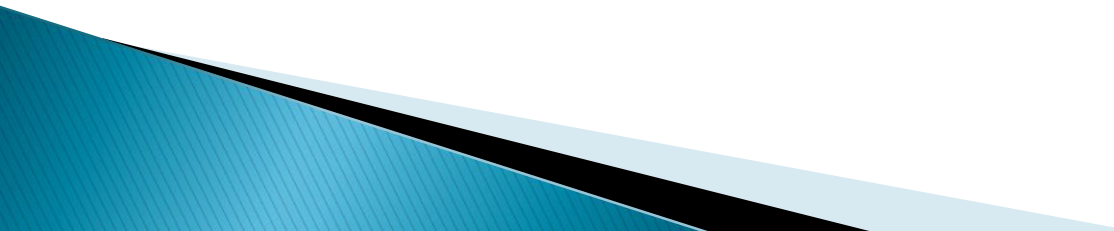


دکتر نوروژا قدیری اصلی
متخصص طب کار و بیماری های شغلی

GENERAL APPROACH TO MUSCULOSKELETAL INJURIES

- ▶ History is most important in diagnosing musculoskeletal problems.
 - ▶ The mechanism of injury can explain the pathology and symptoms
 - ▶ Determine whether the injury is traumatic or atraumatic, acute or chronic, high or low velocity (greater velocity suggests more structural damage), or whether any movement aggravates or relieves pain associated with the injury.
- 

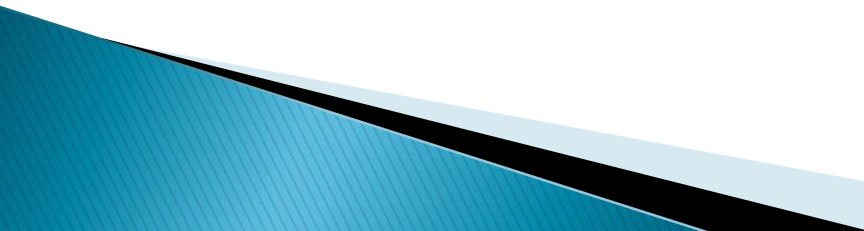
General Considerations

- ▶ Musculoskeletal problems account for about 10–20% of outpatient primary care clinical visits.
 - ▶ Fifty–three percent of adults older than 65 years complain of bothersome pain each month usually with multiple sites of pain and decreased physical function.
- 

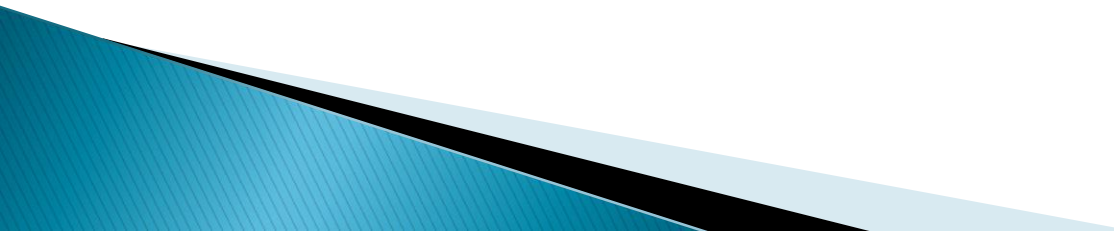
General Considerations

- ▶ Orthopedic problems can be classified as :
 - traumatic (ie, injury-related)
 - atraumatic (ie, degenerative or overuse syndromes)
 - acute
 - chronic.
- ▶ The history and physical examination are sufficient in most cases to establish the working diagnosis
- ▶ the mechanism of injury is usually the most helpful part of the history in determining the diagnosis.


General Considerations

- ▶ The onset of symptoms should be elicited.
 - ▶ With acute traumatic injuries, patients typically seek medical attention within 6 weeks of onset.
 - ▶ The patient should describe the exact location of symptoms, which helps determine anatomic structures that may be damaged.
 - ▶ If the patient is vague, the clinician can ask the patient to point with one finger only to the point of maximal tenderness
- 

Symptoms and Signs

- ▶ The chief musculoskeletal complaints :
 - pain (most common)
 - Instability
 - dysfunction around the joints
 - ▶ Since symptoms and signs are often nonspecific, recognizing the expected combination of symptoms and physical examination signs can help facilitate the clinical diagnosis.
- 

Symptoms and Signs

- ▶ "locking" or "catching" → internal derangement in joints.
 - ▶ "instability" or "giving way" → ligamentous injury (may also be due to pain causing muscular inhibition)
 - ▶ Constitutional symptoms of fever or weight loss, swelling with no injury, or systemic illness → medical conditions (such as infection, cancer, or rheumatologic disease).
- 

physical examination

- ▶ components of the physical examination:
 - Inspection
 - Palpation
 - assessment of range of motion
 - assessment of neurovascular status.
- ▶ Inspection includes observation of swelling, erythema, atrophy, deformity, and (surgical) scars (mnemonic, "SEADS.).
- ▶ The patient should be asked to move joints of concern. If motion is asymmetric, the clinician should assess the passive range of motion for any physical limitation.

special tests

- ▶ There are special tests to assess each joint.
 - **provocative tests** recreate the mechanism of injury with the goal to reproduce the patient's pain.
 - **Stress tests** apply load to ligaments of concern. Typically, 10–15 lb of force should be applied when performing stress tests.
 - **Functional test**, including simple tasks performed during activities of daily living, is useful to assess injury severity.

Imaging

- ▶ **MRI** → the best imaging test for many orthopedic diagnoses
- ▶ standard radiographs → Bony characteristic soft tissue findings.
- ▶ **CT scans** → bony pathology, including morphology of fractures
- ▶ **Nuclear bone scans** → identifying stress injuries, infection, malignancy, or multisite pathology.
- ▶ **Positron emission tomography (PET) scans** → identifying metastatic malignant lesions
- ▶ **MRI** → excellent visualization of ligaments, cartilage, and soft tissues.
- ▶ **High-field 3.0 Tesla MRI** → higher image resolution and decreased examination times compared to the more common standard 1.5 Tesla machines.
- ▶ **MRI arthrogram with Gadolinium contrast** → increase sensitivity of detecting certain internal derangements in joints such as labral injuries.
- ▶ **Musculoskeletal ultrasound** → identifying superficial tissue problems, including tendinopathies and synovial problems.

Repetition
Force

Awkward Position

No Rest

Cumulative Trauma Disorders (CTD)

Occupations associated with CTD

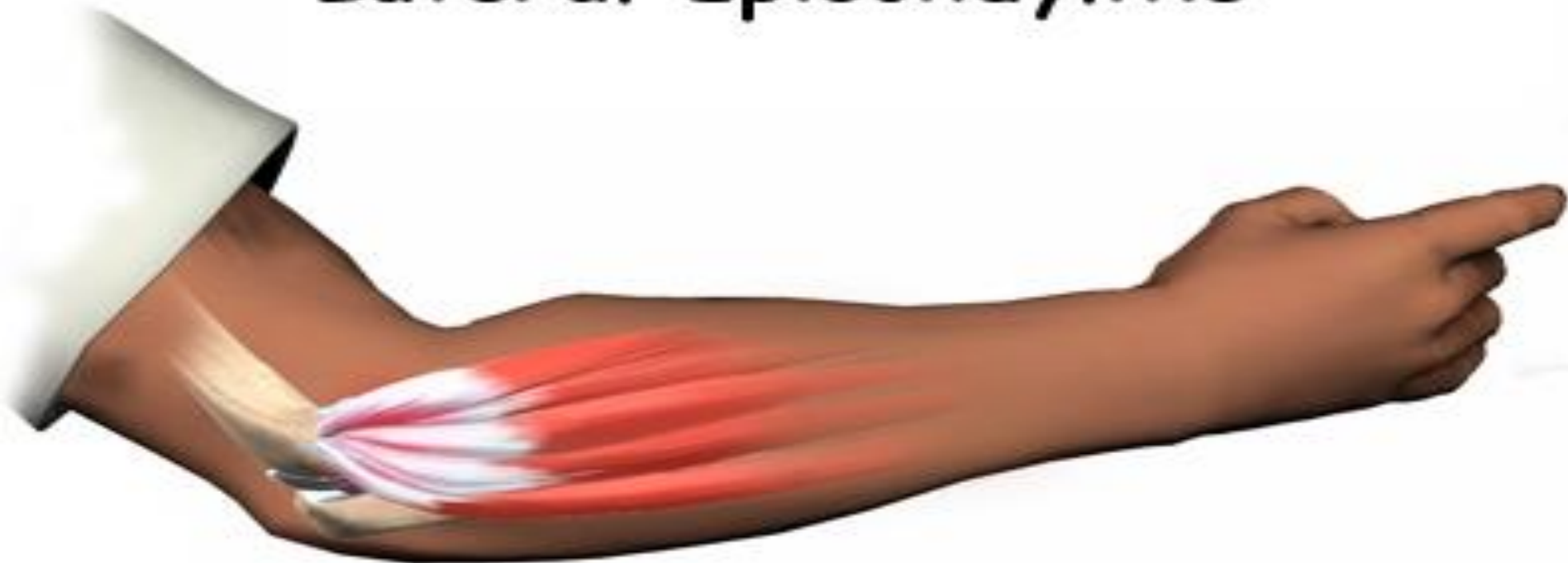
- Aircraft and automotive assembly workers
- Miners, buffers, butchers, drivers, typists
- Vibratory tool users, food preparers
- Electronics assembly workers
- Textile workers, postal workers
- Secretaries, musicians,...

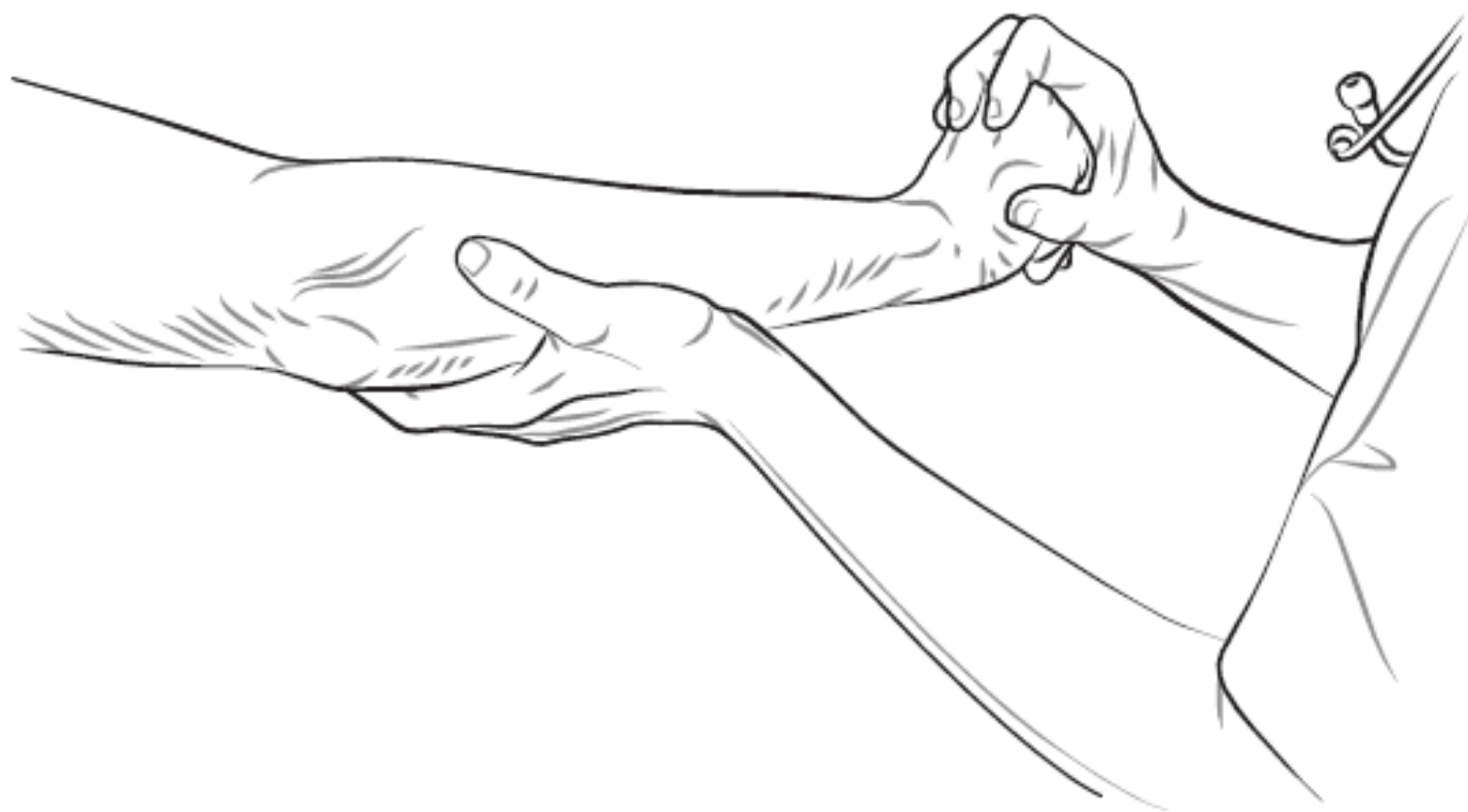
Examples of diagnosis
commonly considered
as work-related CTD

Tendon-related disorders

- Tendinitis / peritendinitis/ tenosynovitis
- Epicondylitis
- De Quervain`s
- Trigger finger
- Ganglion cyst

Lateral Epicondylitis



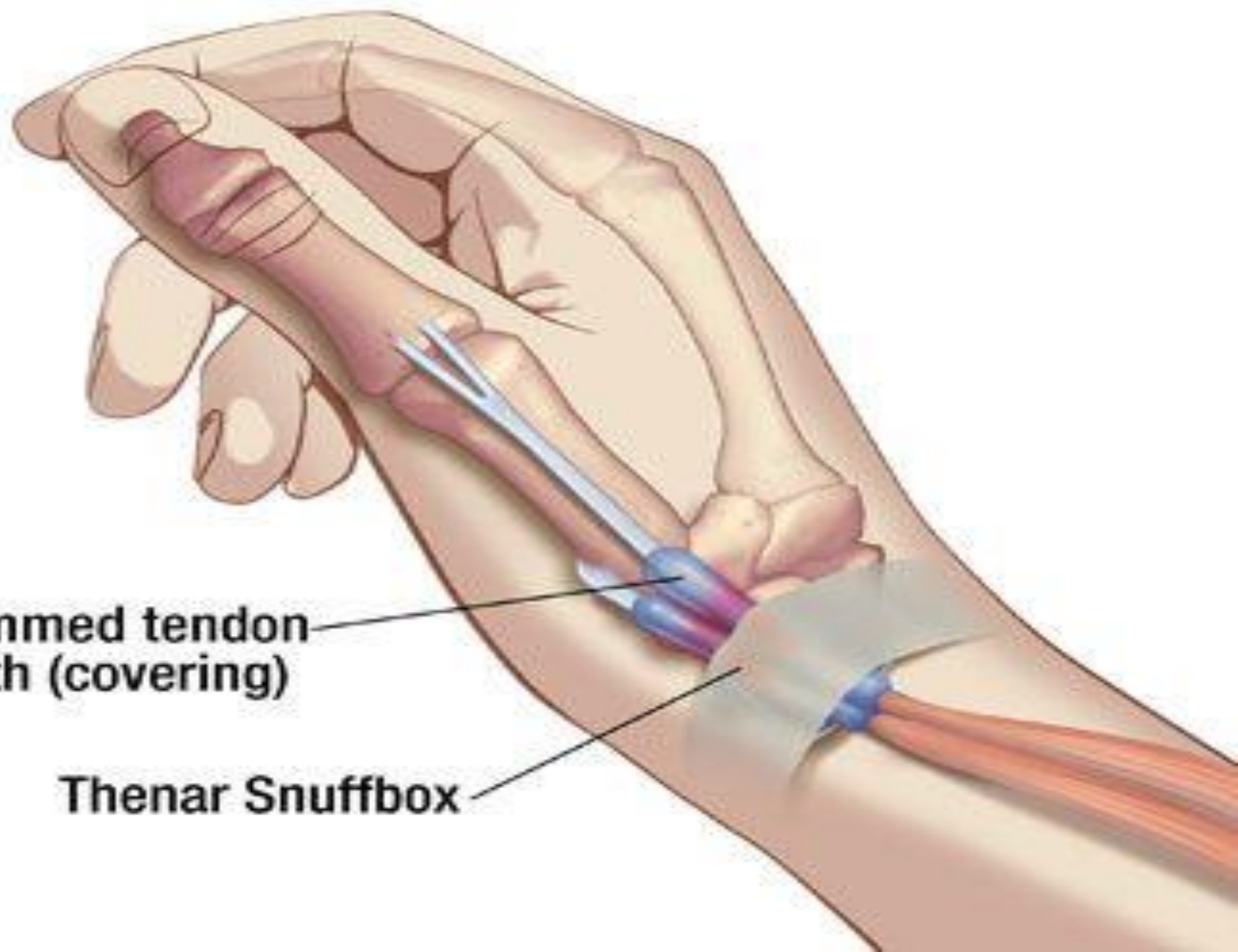


▲ **Figure 8–3. Cozen test:** Physician testing dorsiflexion of a patient's wrist against resistance. Resulting lateral humeral epicondylar pain suggests tennis elbow.

Medial Epicondylitis



De Quervain's Tenosynovitis



Inflamed tendon
sheath (covering)

Thenar Snuffbox





In severe cases when the finger is stuck in a bent position, it should be released surgically to prevent permanent stiffness.

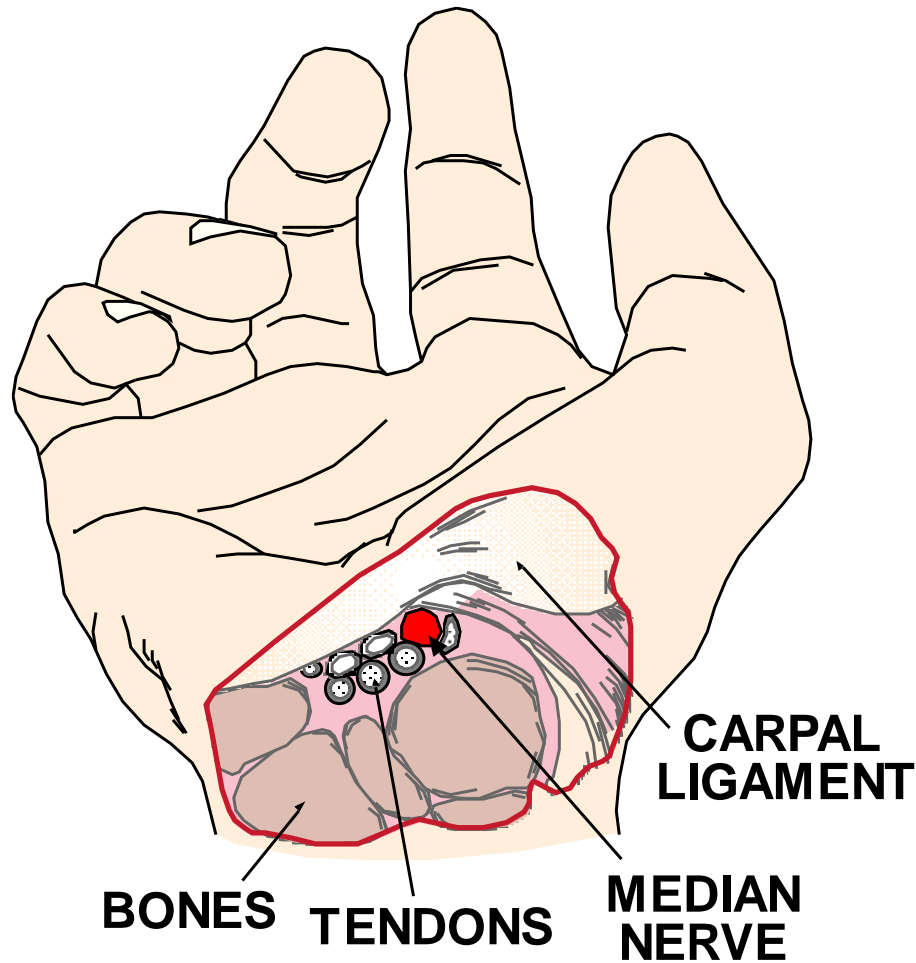
Ganglion Cyst



Nerve-related disorders

- Carpal tunnel syndrome
- Cubital tunnel syndrome
- Guyon canal syndrome
- Pronator teres syndrome
- Radial tunnel syndrome
- Thoracic outlet syndrome
- Cervical syndrome(radiculopathy)
- Digital neuritis

Carpal Tunnel Syndrome



فاکتورهای مهم شغلی جهت ایجاد CTS

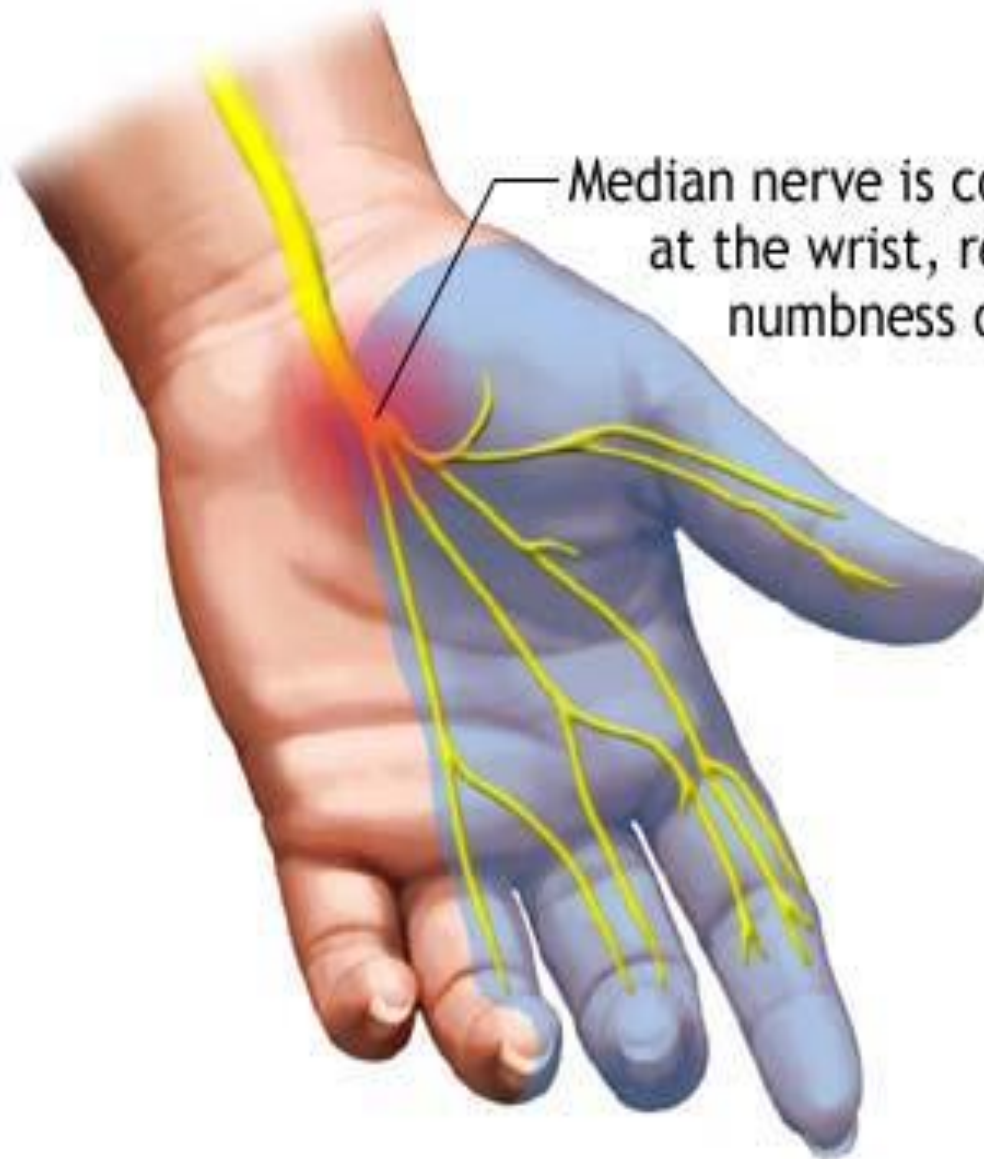
- حرکات تکراری مچ
- انقباض forceful تاندونهای کانال
- FLX یا EXT شدید مچ
- وضعیت غیر ماهرانه
- Pinch
- استرس مکانیکی به عصب مدین
- ارتعاش
- دستکشیهای غیر مناسب
- سرمای محیطی

ریسک فاکتورهای غیر شغلی CTS

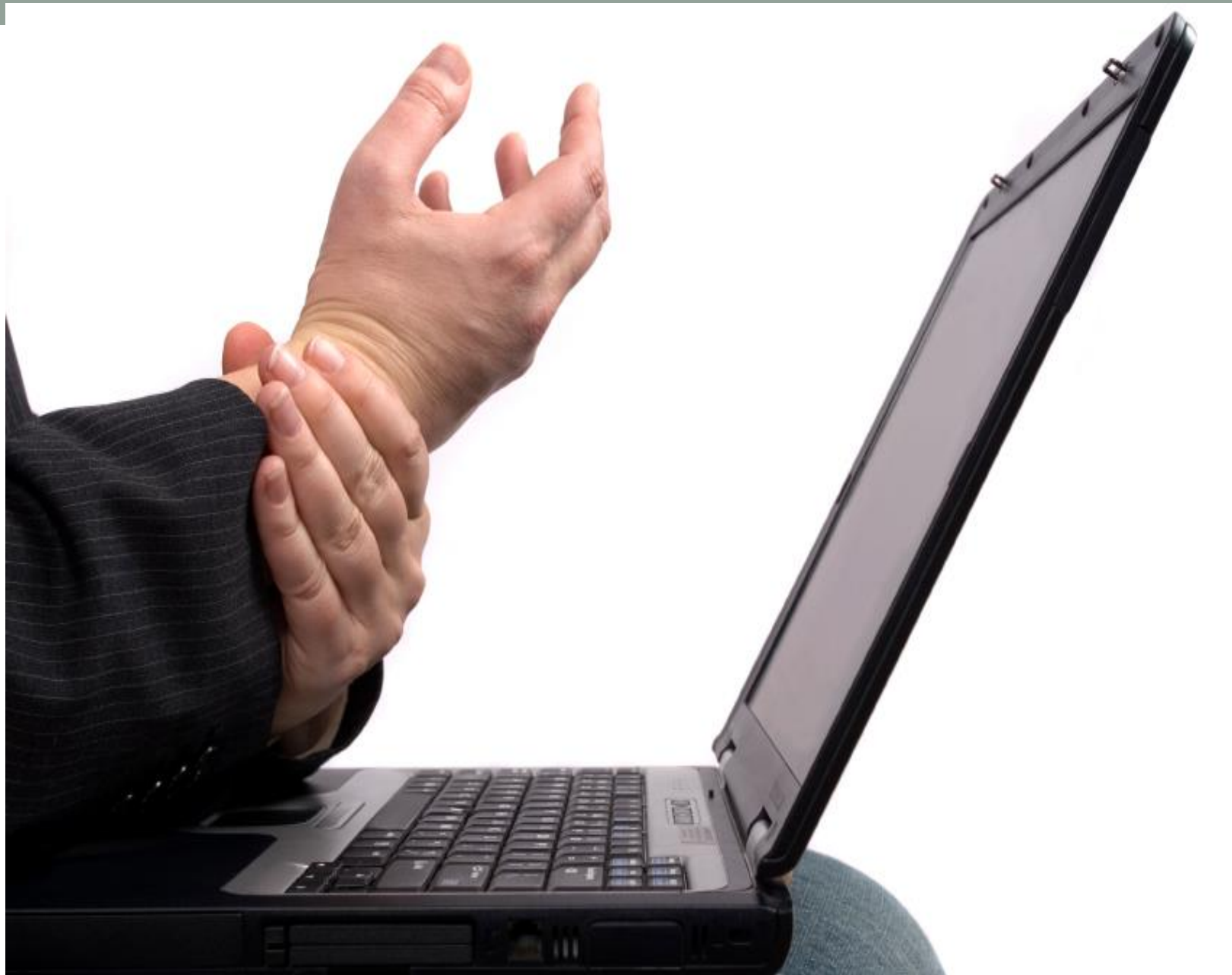
- جنس مونث
- RA
- ادم در هر حالت
- دیابت
- اورمی
- میکسدم
- چاقی
- اکرومگالی
- استئوآرتریت
- حاملگی و منوپوز
- ترومای حاد و شکستگی مچ
- نقرس
- بیحرکتی مچ
- آمیلوئیدوز و مولتیپل میلوما
- کانال کوچک مادرزادی
- رینود

تظاهرات کلینیکی CTS

- پارسیزی متناوب، هیپوستزی یا هیپرسیزی (ابتدا دست غالب و گاهی فقط انگشت میانی)
- درد و کرختی که در ۱۵٪ موارد به بازو و شانه منتشر
- علائم بیشتر شبها بروز و گاهی فرد را از خواب بیدار
- درد با تکان دادن یا ماساژ یا قرار دادن در آب گرم یا سرد تسکین
- احساس تورم
- کاهش مهارت دست
- ناتوانی در تشخیص حس گرما یا سرما
- دیس فانکشن اتونومیک و کاهش تعریق



Median nerve is compressed
at the wrist, resulting in
numbness or pain



مشاغل در معرض CTD

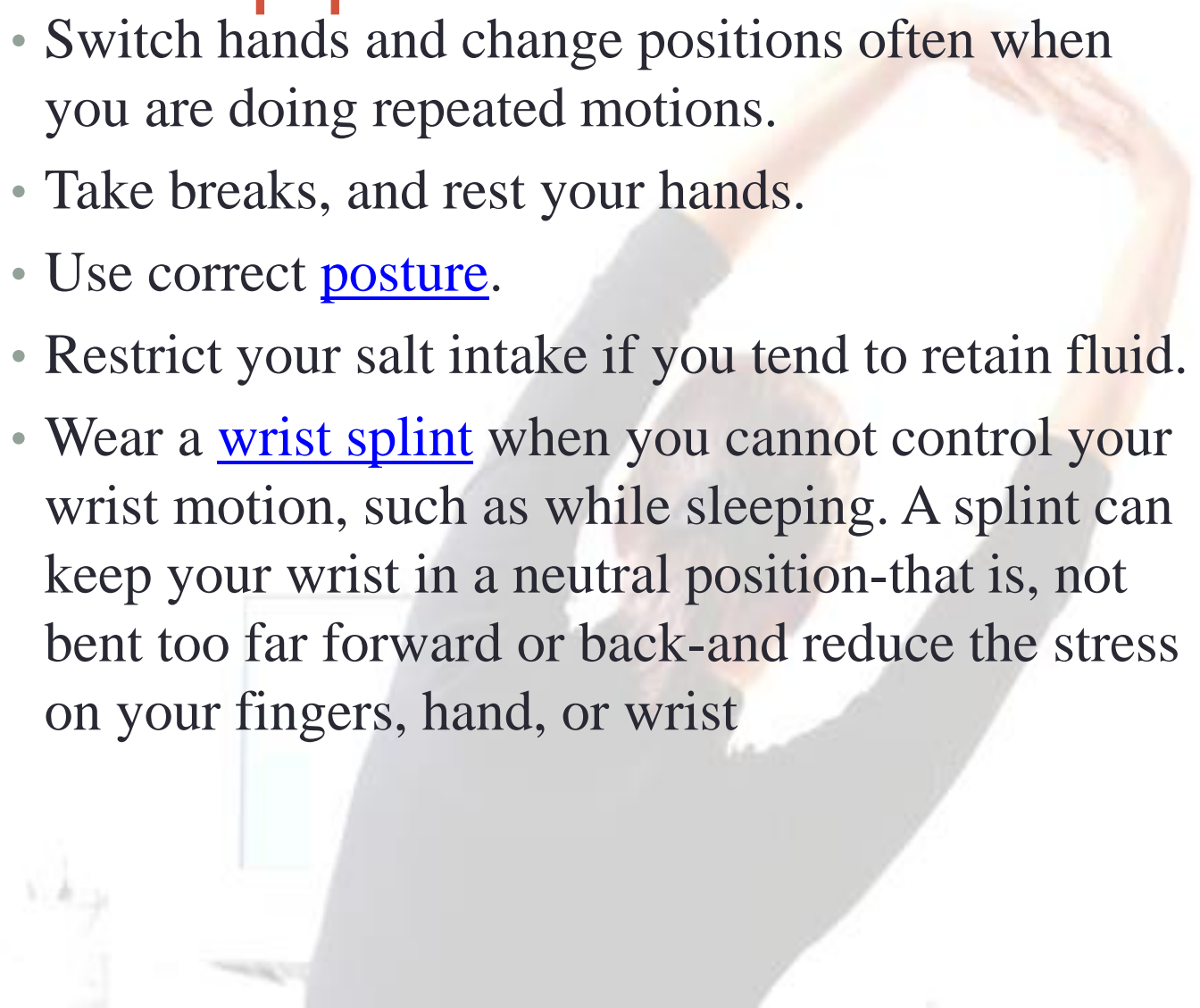
- بیشترین در meat packing (بسته بندی گوشت)
- کارگران مرغداری و کشتارگاه
- مونتاژکاران
- سنباده کاری
- صندوقدار
- معدنچی
- VDT users
- کارگران نساجی

To help prevent CTS

- Take good care of your general health:
 - staying at a healthy weight, not smoking, and getting regular exercise.
- Keep your arm, hand, and finger muscles strong and flexible.
- Stop any activity that you think may be causing finger, hand, or wrist numbness or pain.
- Use hand and wrist movements that spread the pressure and motion evenly throughout your hand and wrist. For example, keep your wrists straight or only slightly bent. Avoid activities that bend or twist the wrists for long periods of time.

To help prevent CTS

- Switch hands and change positions often when you are doing repeated motions.
- Take breaks, and rest your hands.
- Use correct [posture](#).
- Restrict your salt intake if you tend to retain fluid.
- Wear a [wrist splint](#) when you cannot control your wrist motion, such as while sleeping. A splint can keep your wrist in a neutral position-that is, not bent too far forward or back-and reduce the stress on your fingers, hand, or wrist



Home treatment for CTS

- Can ease pain and prevent further or permanent damage to your median nerve.
- May completely relieve your symptoms if you start treatment when symptoms first occur.

Home treatment for CTS

If you have mild symptoms, such as occasional tingling, numbness, weakness, or pain in your fingers or hand, follow these steps to reduce inflammation:

1. Rest your fingers, hand, and wrist. Stop activities that you think may be causing numbness and pain. When your symptoms improve, resume the activity gradually. As you do, keep your wrists straight or only slightly bent.
2. Ice your wrist for 10 to 15 minutes at a time, once or twice an hour.
3. Consider taking (NSAIDs) to relieve pain and reduce swelling. Studies haven't shown NSAIDs to be effective for carpal tunnel syndrome, but they may help relieve your symptoms.
4. Wear a wrist splint at night to keep your wrist in a neutral position and relieve pressure on your median nerve.



درمان CTS

- درمان کنسرواتيو(علائم خفيف ومتناوب کوتاه مدت
عدم وجود آتروفي)

- درمان جراحی



درمان کنسرواتیو CTS



• NSAID

• Splint موقت و شبانه

• Splint دائمی

• تغییر شغل

استراتژی کاهش CTS

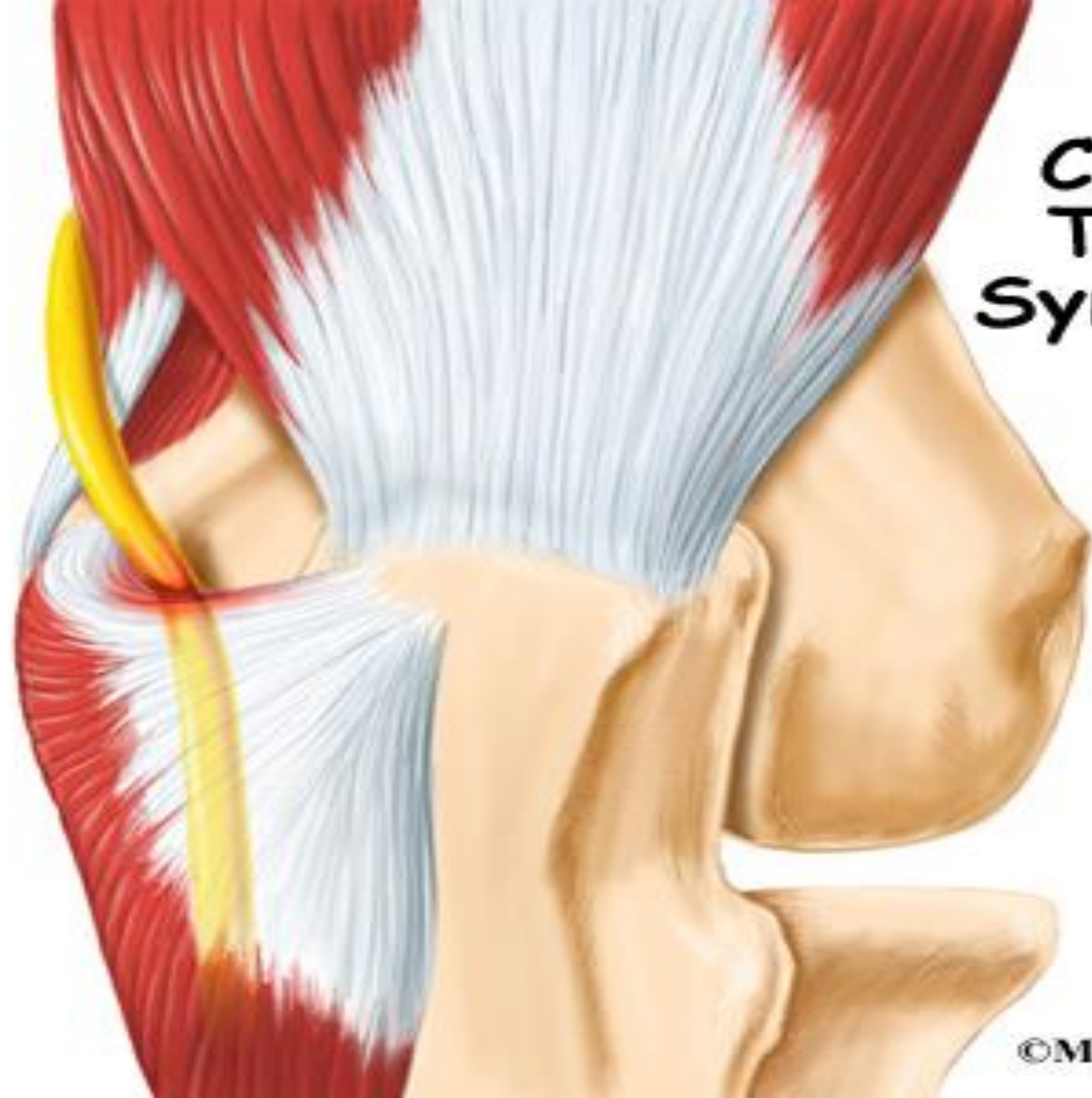
- کنترل حرکات تکراری
اتوماتیک کردن
آنالیز مشاغل و حذف حرکات بیهوده
کاهش اضافه کاری
کاهش کنترات کاری
- کنترل نیرو
انتخاب ابزار صحیح با سطح تماس کافی
استفاده از ابزارهای با دسته های دو تایی
انتخاب صحیح دستکش



Nerve-related disorders

- Carpal tunnel syndrome
- Cubital tunnel syndrome
- Guyon canal syndrome
- Pronator teres syndrome
- Radial tunnel syndrome
- Thoracic outlet syndrome
- Cervical syndrome(radiculopathy)
- Digital neuritis

Cubital Tunnel Syndrome

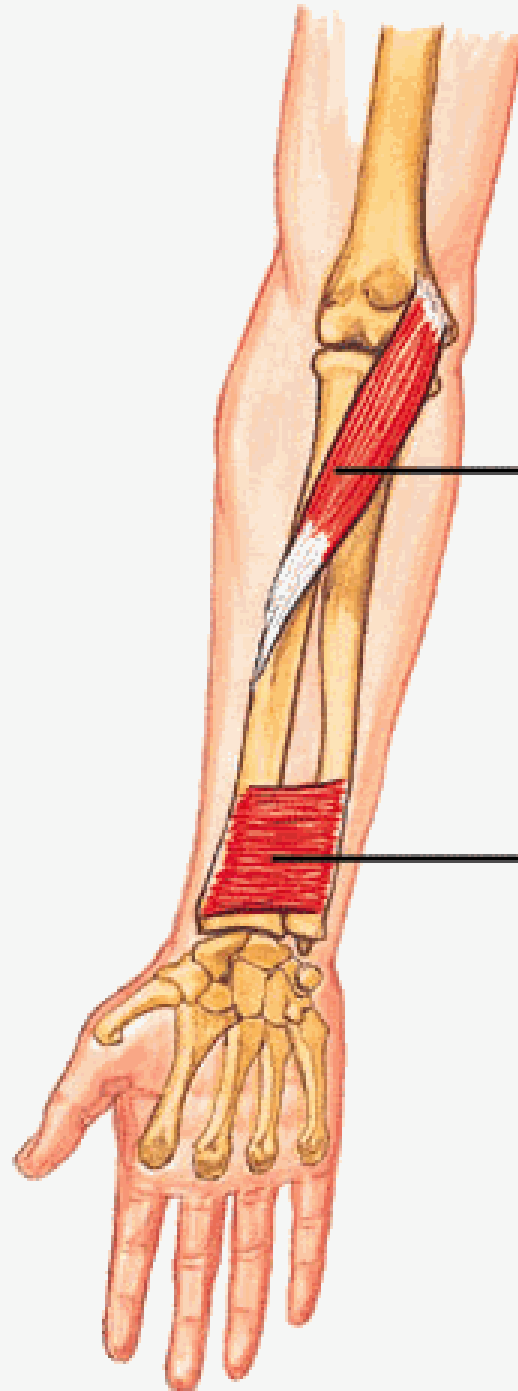




➤ Guyon canal syndrome

©MMG 2001

Anterior Forearm Muscles (3)



**Pronator
teres**

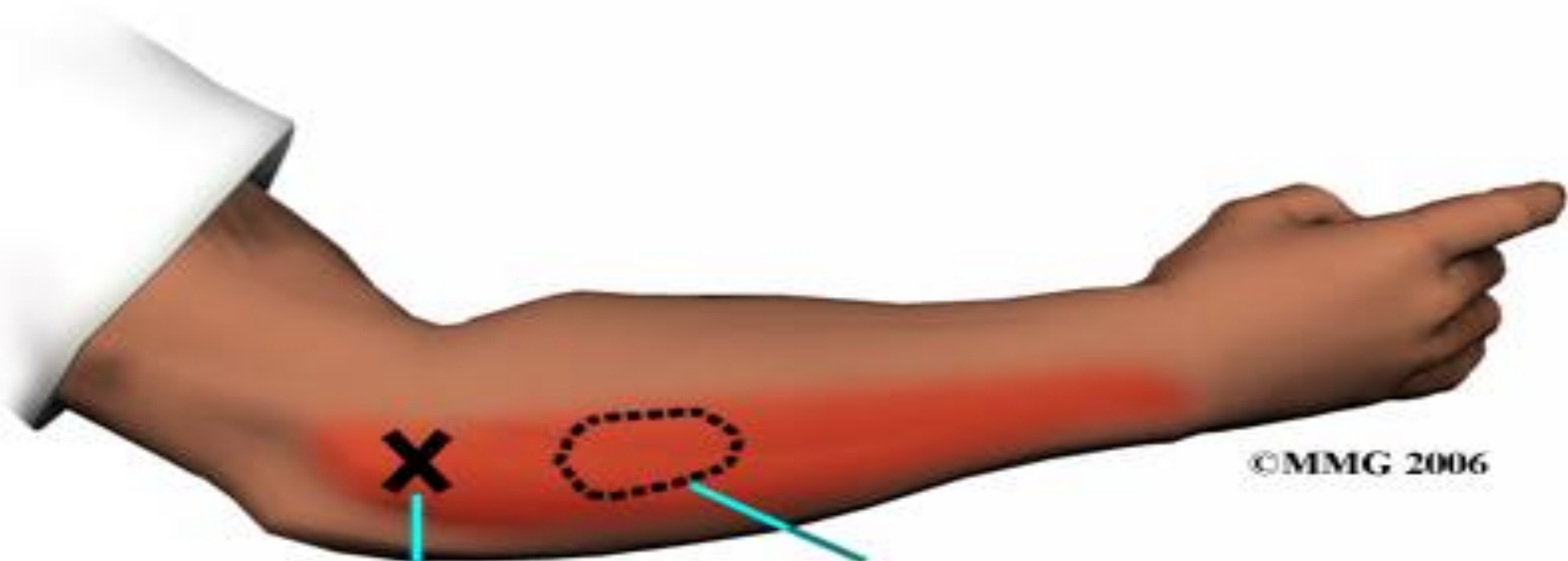
➤ Pronator teres syndrome

**Pronator
quadratus**

Radial Tunnel Syndrome



©MMG 2001



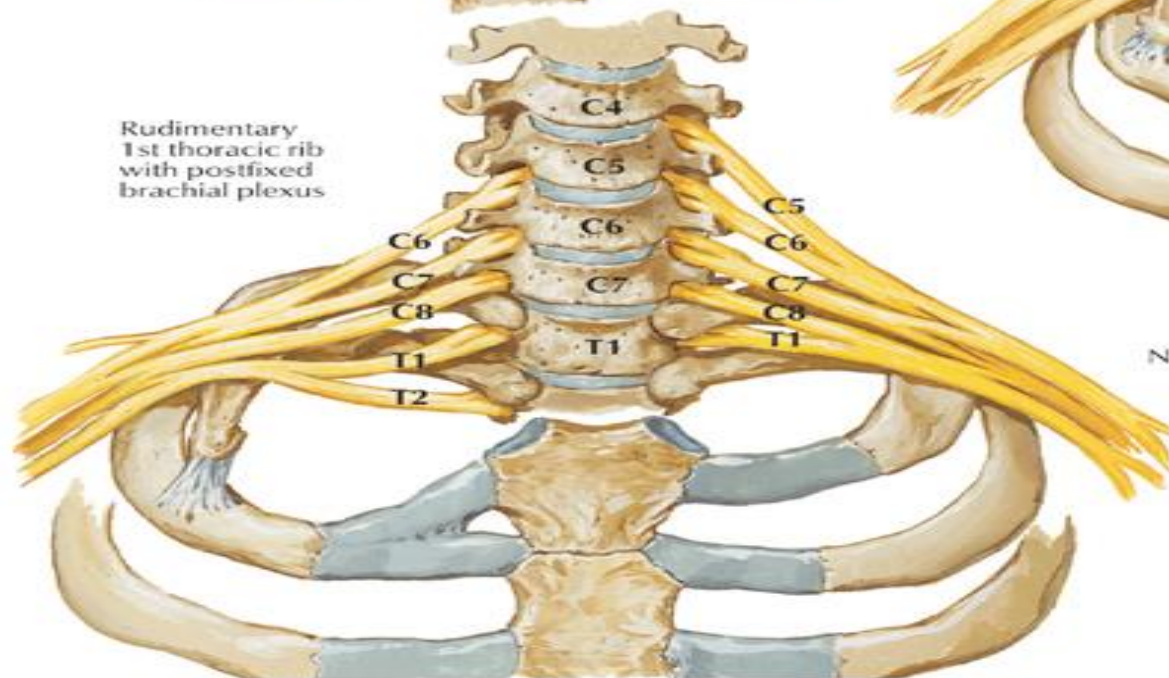
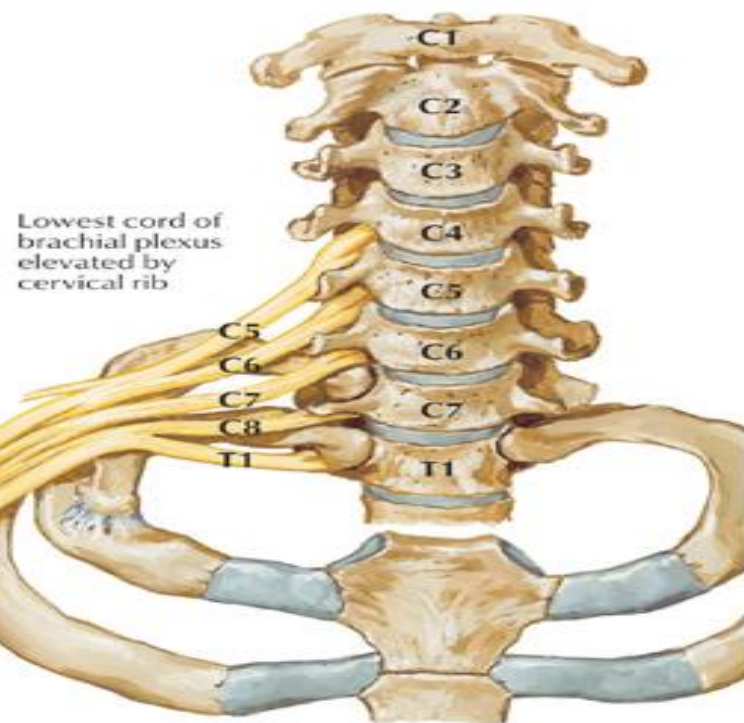
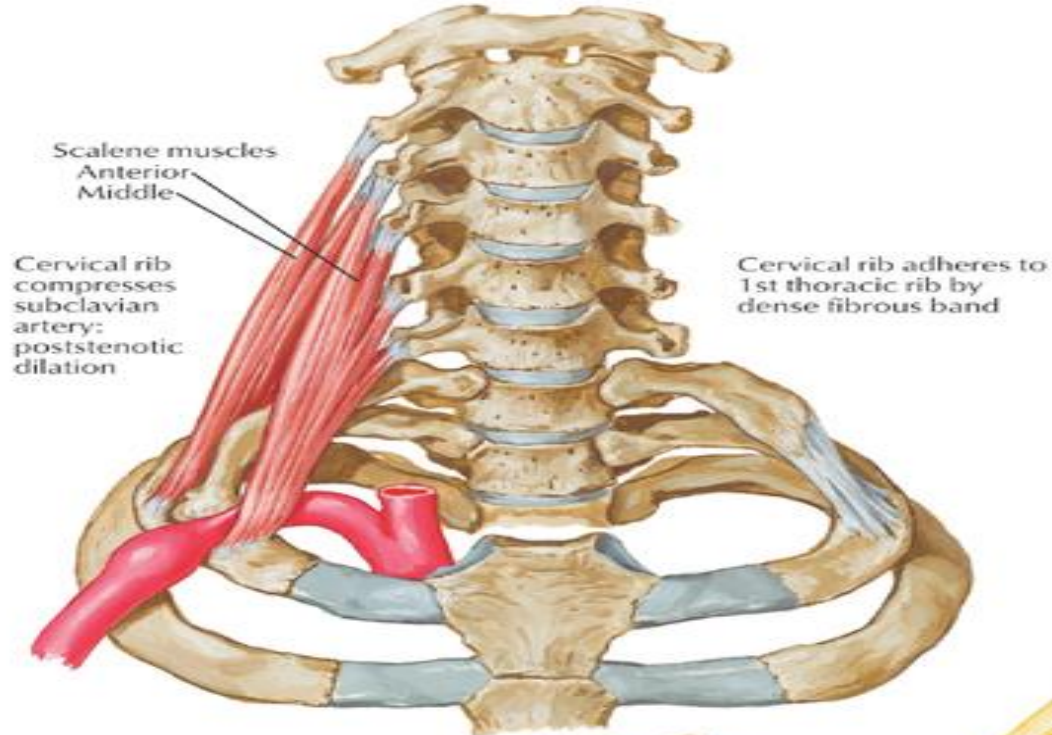
©MMG 2006

**Tennis elbow
tenderness**

**Radial tunnel
tenderness**

Thoracic outlet syndrome

- TOS IS A NEUROVASCULAR IMPINGEMENT SYNDROME OCCURRING AT DIFFERENT ANATOMICAL LEVELS WHERE THE **BRACHIAL PLEXUS** AND THE **SUBCLAVIAN VESSELS** MAY BE ENTRAPPED
- NEUROGENIC TOS IS CAUSED BY A **CERVICAL RIB** OR A **FIBROUS BAND** THAT MAY IMPINGE THE LOWEST PART OF THE BRACHIAL PLEXUS
- EPIDEMIOLOGY AND WORK RELATEDNESS IS VARIABLE

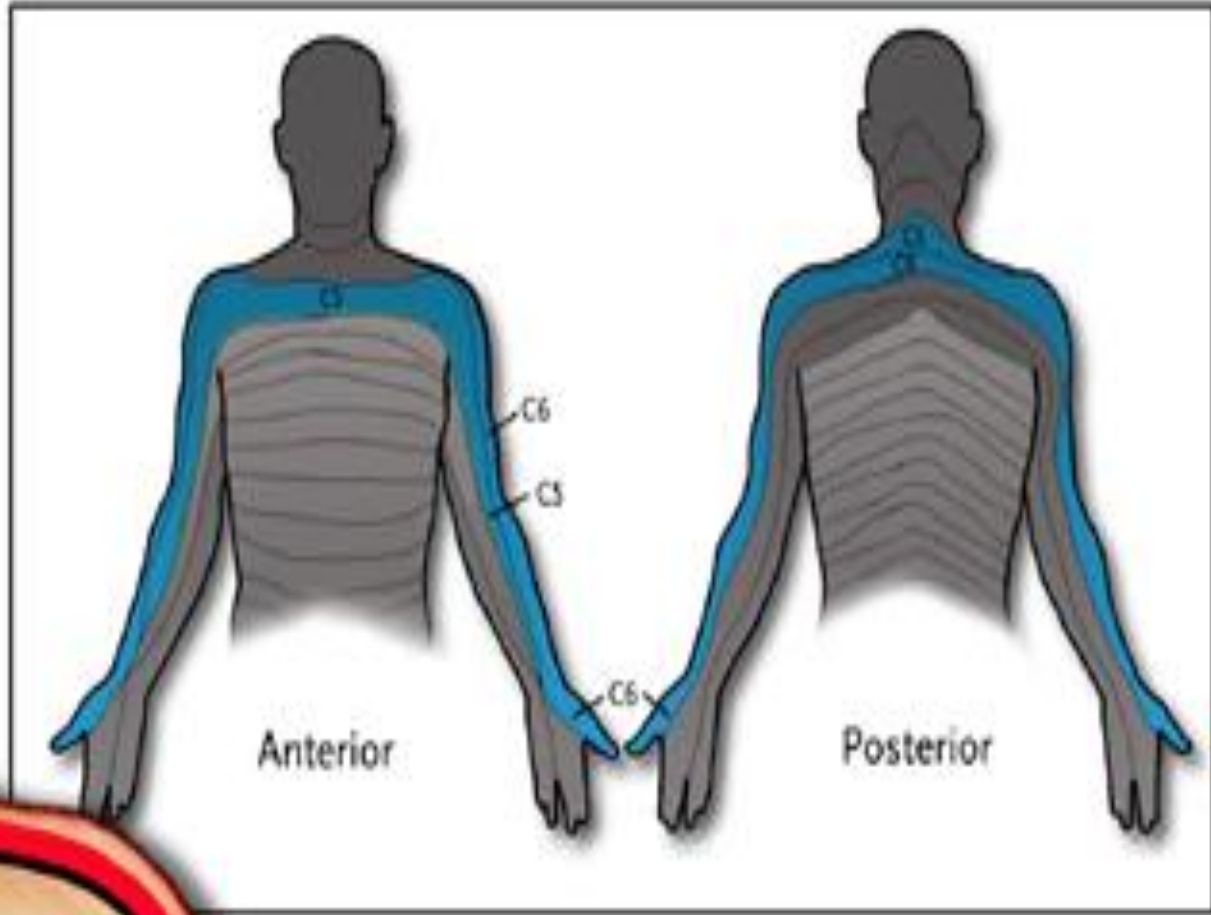
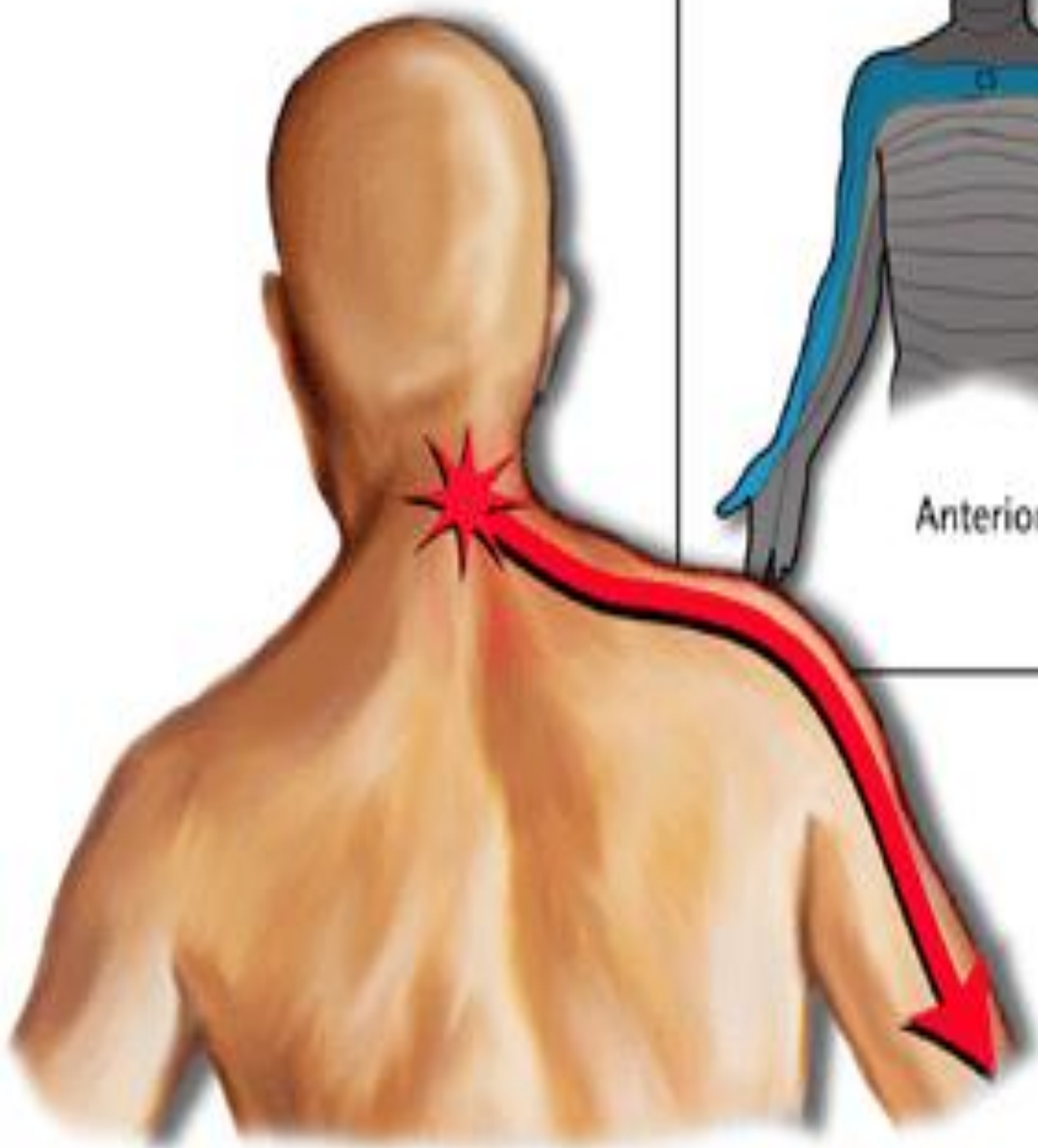


Normal morphology

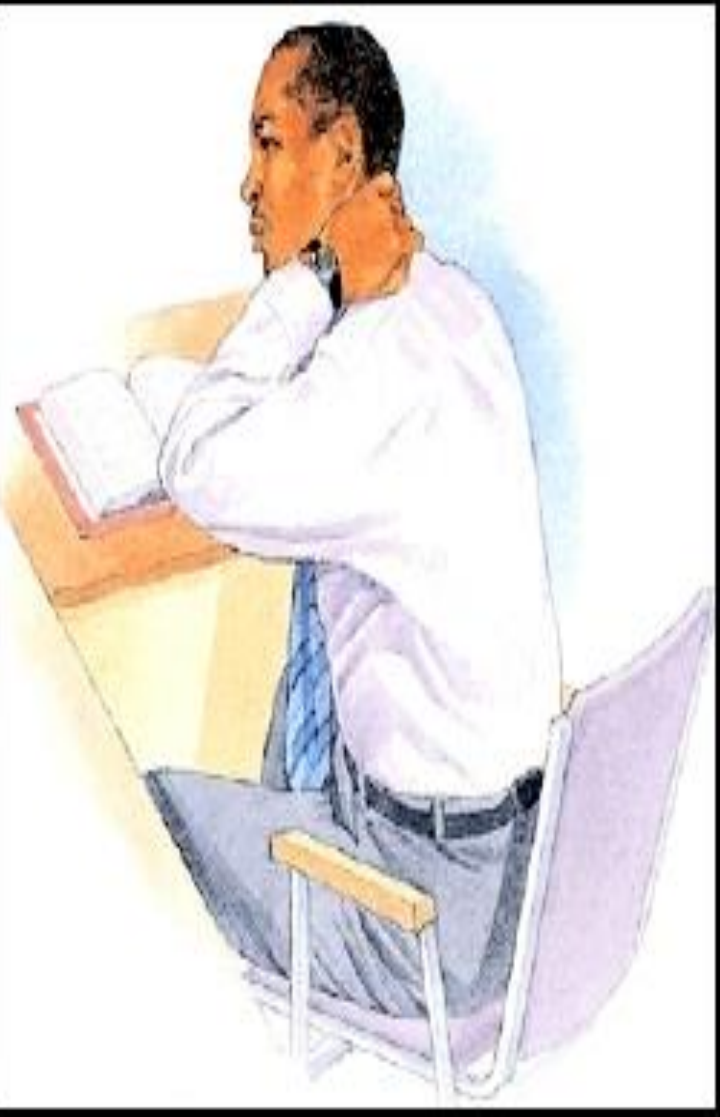
Note: Cervical rib also often asymptomatic

Cervical Radiculopathy





Cervical discopathy



- مشاغل در معرض خطر:

مشاغلی در مدت طولانی گردن در حالت ثابت قرار می گیرد.

مثل نویسندگان، ویراستاران، مونتاژکاران، کاربران کامپیوتر، اپراتور دستگاهها، رانندگی، دندانپزشکان و...





Neck Pain



Cervical discopathy

- اغلب بالای ۴۰ سال
- اغلب علت ناشناخته
- شایعترین دیسک درگیر c5-c6
- گرافی اغلب نرمال

علائم دیسکوپاتی گردنی

- درد گردنی اغلب بعد از نگه داشتن طولانی سر در حالت EXT یا FLX (آسیب بیشتر)
- درد بیشتر پشت گردن و یا پایین اسکاپولا
- درد بیشتر در انتهای حرکت گردنی
- محدودیت حرکتی در بعضی افراد وجود دارد
- تندرns لوکال که غیرمعمول است
- سابقه شغلی که وضعیت ثابت گردنی یا نشستن طولانی
- عدم رضایت شغلی
- مونوتونی



نکات قابل توجه در دردهای گردنی

- سن بالای ۵۰ سال به کانسر (توجه به علائم کانسر)

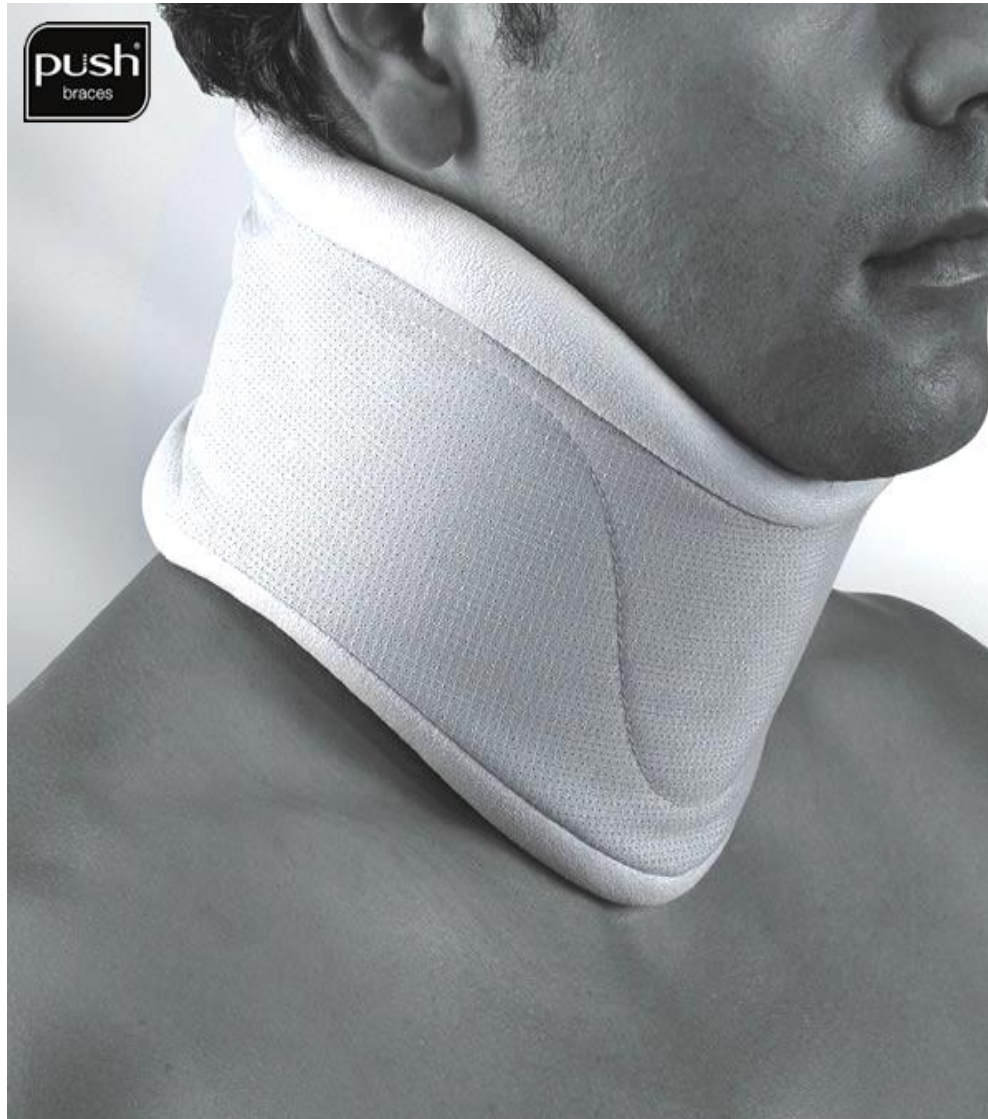
- عفونت ها (ESR)

- مصرف استروئید (احتمال شکستگی)

در موارد فوق درد دائم و با خوابیدن و استراحت بهبودی ایجاد نمی شود

درمان دیسکوپاتی گردن

- طی چند ماه اول اجتناب از وضعیت ثابت و بتدریج ورزش
- کولار گردنی در حالت حاد و طی هفته اول مفید است
- در موارد شدیدتر FLX مختصر و کشش گردنی طی هفته اول
- استراحت و دراز کشیدن در وضعیتی که سر در زاویه ۴۵ درجه قرار گیرد
- تعدیل شغل و اصلاح ارگونومیک محیط کار
- روتیشن کاری
- NSAID، گرمادرمانی، ماساژدرمانی



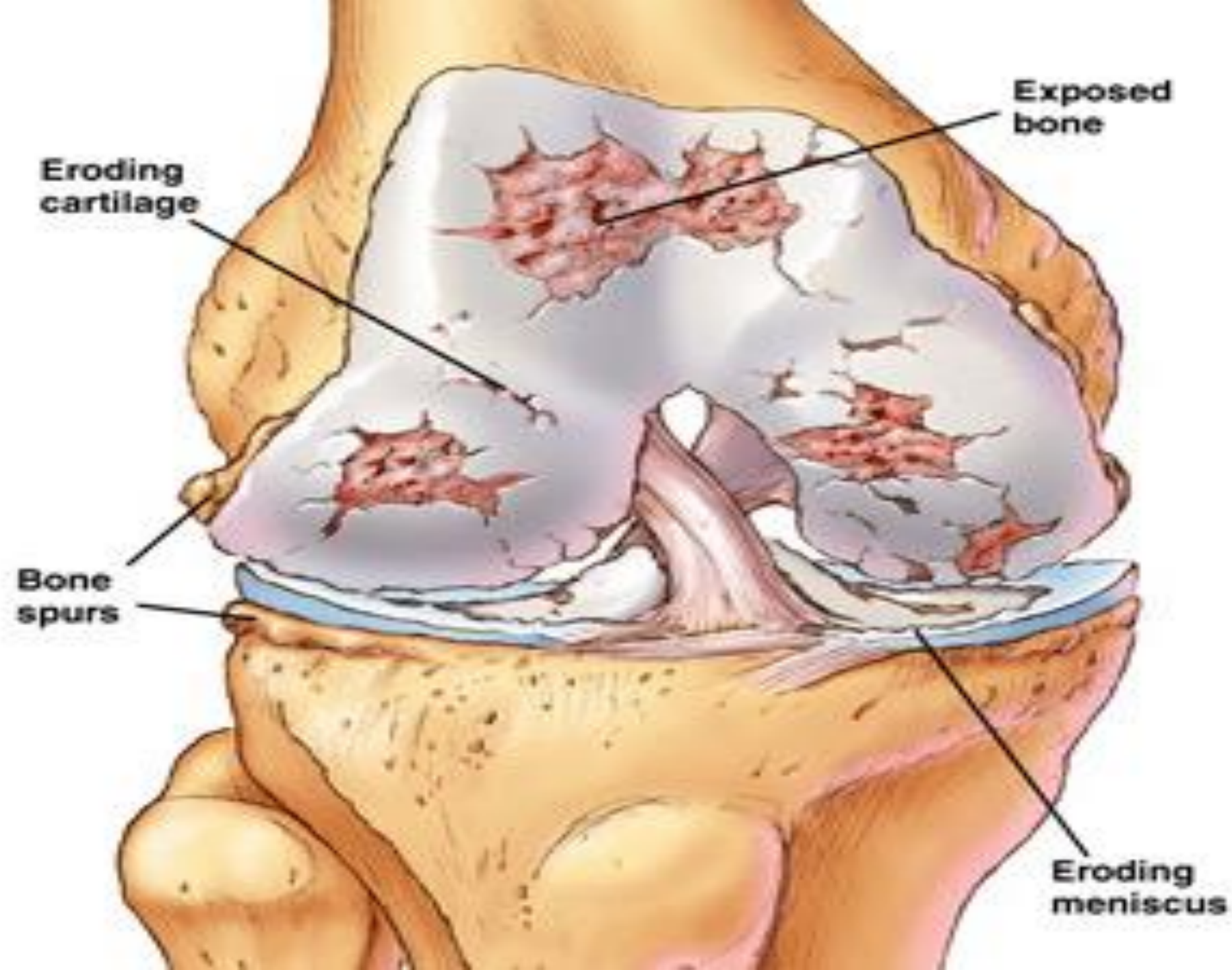
پیشگیری از درد های گردنی

- مهمترین اقدام رعایت اصول ارگونومیک می باشد
ارتفاع صندلی و میز تناسب داشته باشد
محیط کار بگونه ای باشد که از EXT&FLX اجتناب شود
نور اتاق در حد مناسب و بین ۵۰۰-۳۰۰ لوکس باشد
محیط کار بهتر است روبروی چشم و تا حداکثر ۴۵ درجه پایینتر باشد
- حداقل هر ۲۰ دقیقه یکبار به طرفین نگاه کند
- ورزش های گردنی در محیط کار

Joint-related disorders

- Osteoarthritis predominantly hip and knee
- shoulder joint and acromioclavicular joint osteoarthritis





Muscle-related disorders

- Tension neck syndrome
- Muscle sprain and strain
- Myalgia and myositis

Strained muscle tissue



Normal muscle tissue



Circulatory-related disorders

- Hypothenar hammer syndrome
- Raynaud`s syndrome



Bursa-related disorders

- Bursitis of most joints

Olecranon bursitis





**Chronically
thickened
bursa**

This anatomical diagram illustrates a cross-section of a knee joint. The femur (thigh bone) is at the top, and the tibia (shin bone) is at the bottom. A large, light blue, irregularly shaped mass is shown between the bones, representing a chronically thickened bursa. A red, fibrous structure, likely a ligament or tendon, is visible on the left side of the joint. The surrounding tissue is depicted in shades of brown and tan.

Challenge

- The most challenging task for the health care : whether the symptomatology is **work related**
- The second : determine criteria for the **safe return to work** after treatment of the injury
- The third : **prevent recurrence**

Management

- **A detailed interview of job tasks**, which is essential to understand the **work relatedness**
- The history must include information on **prior and current occupations**, which is important in determining if the reported risk factor accords with the patient`s symptomatology
- **Repetitive tasks, awkward posture, high force exertion, long exertion time, use of handheld vibrating tools**

Suggested evaluation for upper extremity CTD

- Clinical issues
- Ergonomic issues
- Psychosocial issues

Suggested evaluation for upper extremity CTD

- Clinical issues

Objective finding: swelling, joint and tendon crepitation,...

Reasonable subjective finding: pain, tenderness, sensory loss,...

Unreasonable subjective finding: diffuse , vague unreproducible pain,...

Suggested evaluation for upper extremity CTD (cont)

- Ergonomic issues

Minor issues: correctable **workstation** problem or minor ergonomic **instruction**

Moderate issues: high **repetition**, high **force** or abnormal **position** that are **correctable**

Major issues: high repetition, high force or abnormal position that are **not correctable**

Suggested evaluation for upper extremity CTD (cont)

- Psychosocial issues

Minor: usually **administrative** issues such as **minor conflicts with the supervisor**

Moderate: job frustration, job stress, management insensitivity,...

Major: **long** standing unresolved frustration, anger, **job stress plus degree of depression** that are difficult to treat

Prevention

- The best medicine for treating CTD is to **prevent the problem from occurring in the first place.**
- Ergonomics: Even subtle changes in the way a work station is designed or how a job is done can lead to pain or injury.
- Rest and Relax

To avoid CTD problems

- **Examine your own work habits.** Watch arm, wrist, hand, and finger positions. Avoid extension (bending the wrist up and back) and flexion (bending the wrist towards the palm) while working. Keep the forearm wrist and hand in a neutral (in-line) position. Be careful of pinching and gripping actions.
- **Redesign your work habits.** Think about what you are asking your body to do. Make the work as easy on your frame as possible.
- **Take frequent breaks** while performing rapid and repetitive or physically stressful tasks.

To avoid CTD problems(cont)

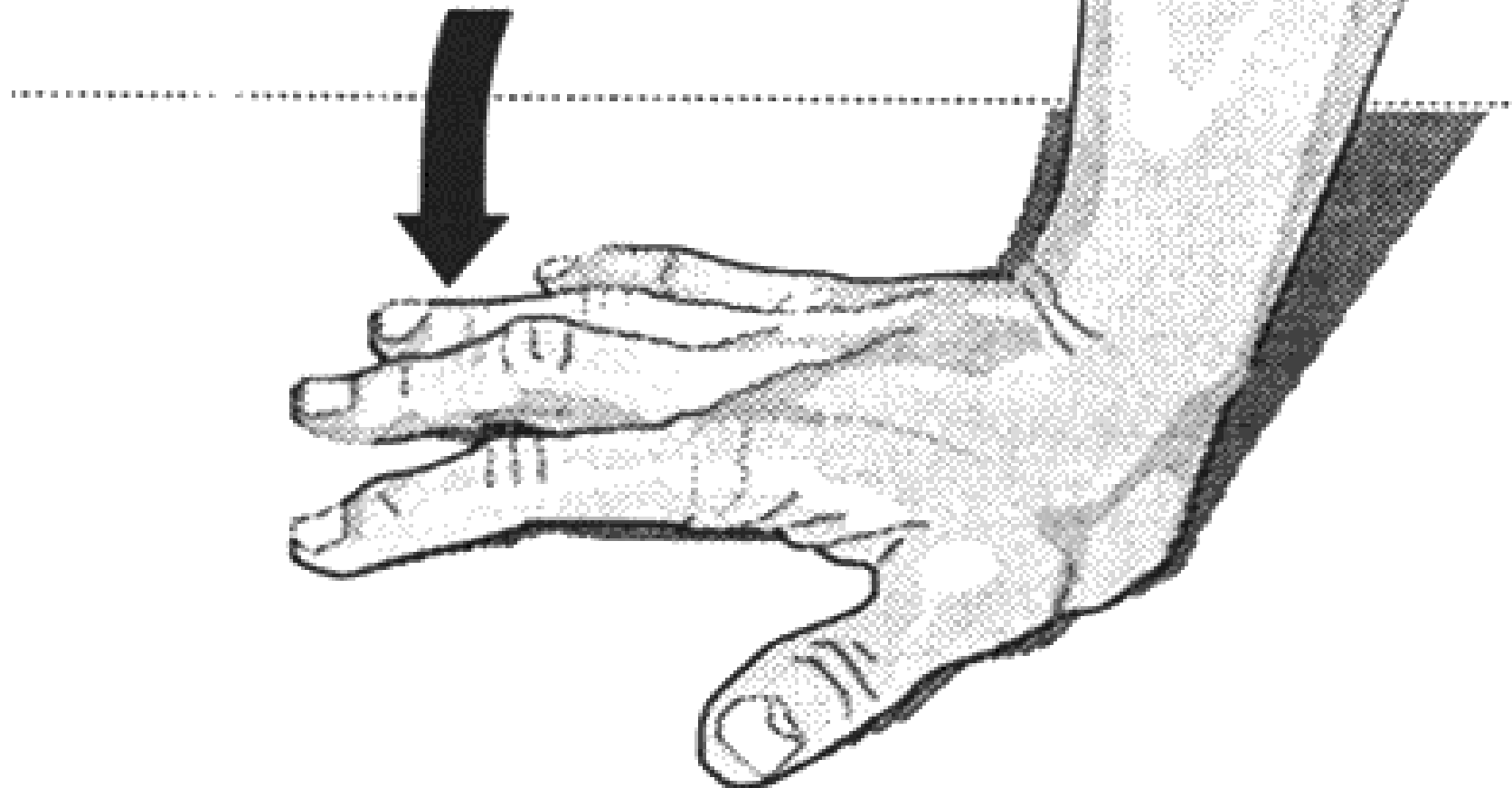
- **Repetitive** tasks with cycle times of less than 30 seconds are more stressful. Try modifying the task to decrease the repetition rate.
- Working with the **hands and arms elevated** can cause **thoracic outlet syndrome**. Even 4 minutes of light work can cause considerable static effort that can contribute to the thickening of tendons and compression of the nerves and blood vessels between the neck and shoulder.
- Invest in **good work chairs** that match work table height. Chair should support back. Feet should be flat on floor or on a solid foot rest.



To avoid CTD problems(cont)

- **Stretching exercises** are very good. Stretching improves blood circulation and lubricates the tendons.
- **Never stretch to the point of pain or discomfort.**
- If you are having a problem, don't begin stretching until consulting with a qualified physician.
- It is best to correct poor work habits before manifesting symptoms.

Gently press hand against table, stretching fingers and wrist for five seconds.

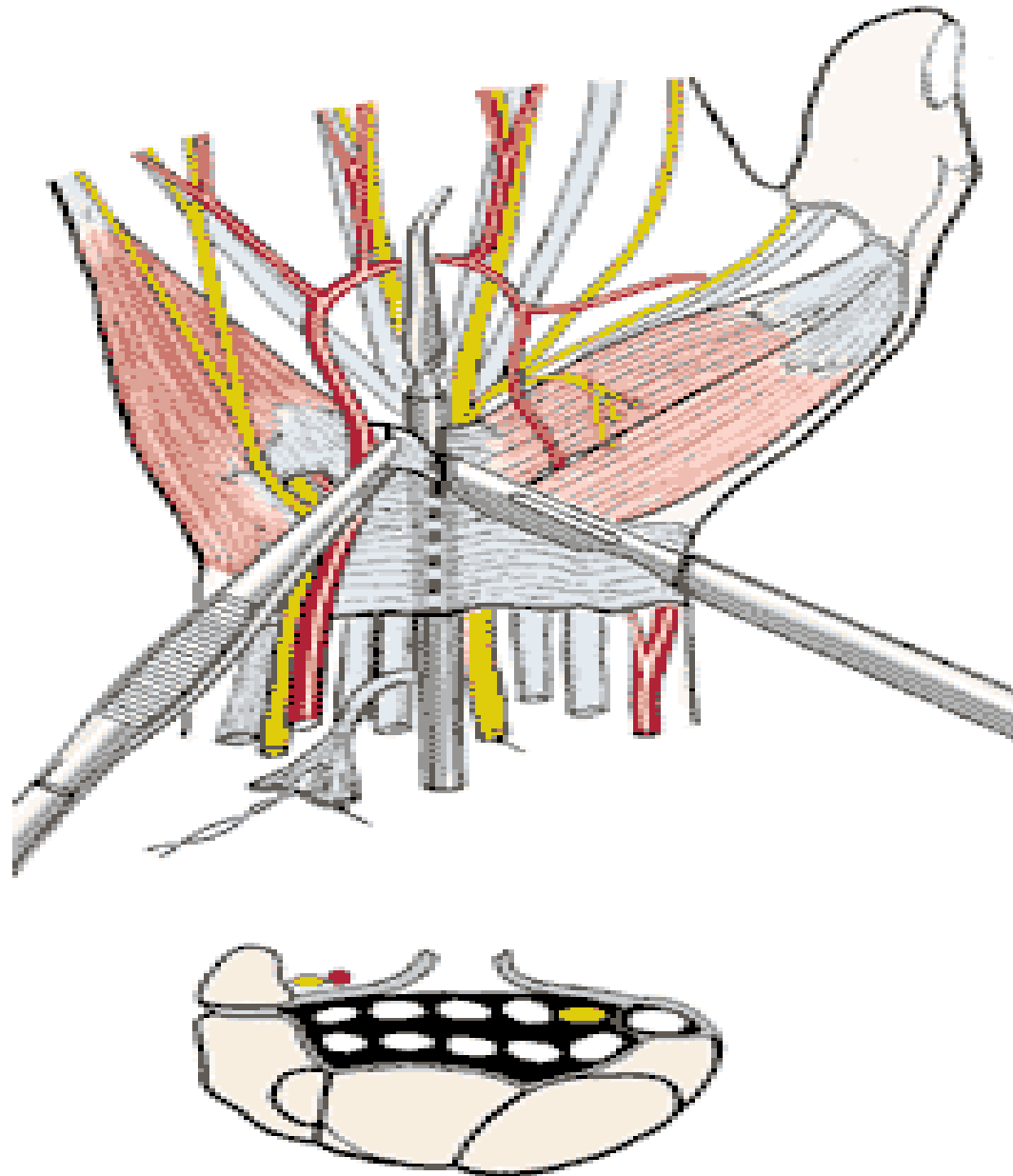


Treatment


- Most CTDs fall in the category of nerve entrapment or soft-tissue inflammation
- Early stage: rest of the affected area
- Medication
- Surgery



Opening of the Carpal Tunnel



Repetition
Force
Awkward Position
No Rest
CTD

A close-up photograph of a small bird, possibly a sparrow, in flight. The bird is positioned on the left side of the frame, facing right towards a human hand. Its wings are spread wide, showing the intricate structure of its feathers. The bird's plumage is a mix of brown, grey, and white, with a distinctive dark patch around its eye. A human hand, with fingers slightly curled, is on the right side of the frame, holding a small, light-colored, crumbly piece of food. The background is a soft, out-of-focus green, suggesting an outdoor setting with foliage. The overall scene conveys a sense of interaction and care between the human and the bird.

Thanks for your attention

