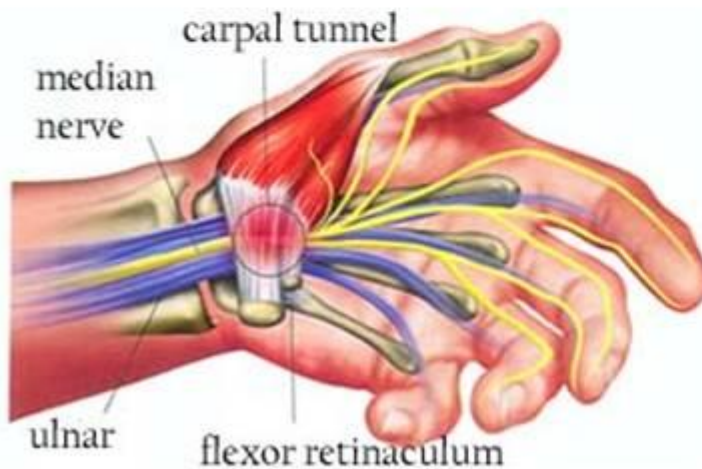


Carpal Tunnel Syndrome!

Mod 2 MMT Course



Official Definition

- Carpal tunnel syndrome, the most common focal peripheral neuropathy, results from compression of the median nerve at the wrist.

epidemiology

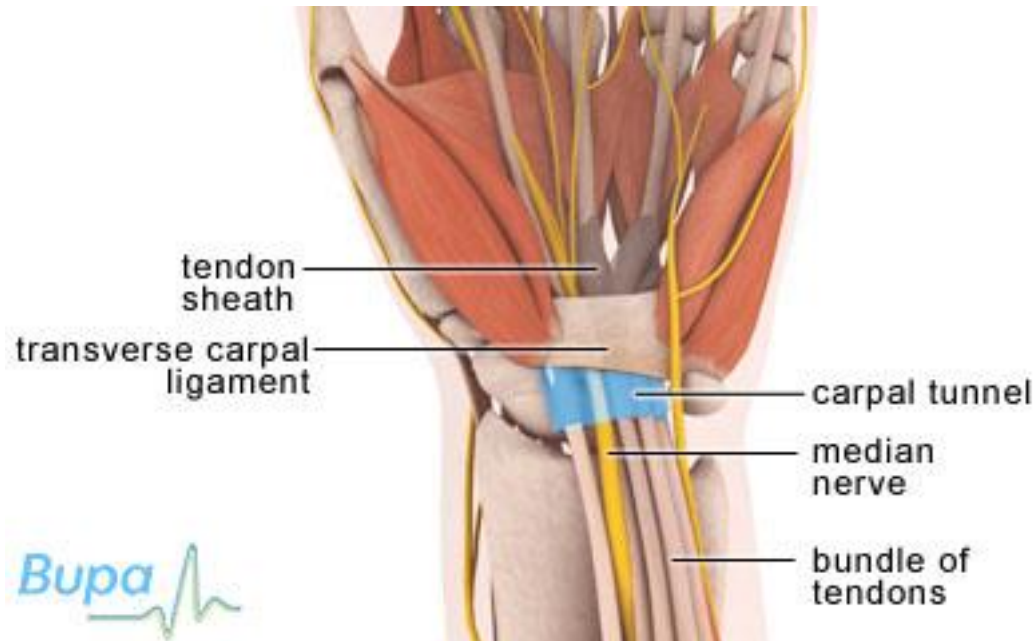
- Affects an estimated 3 percent of all adult Americans
- Three times more common in women than in men
- High prevalence rates have been reported in persons who perform certain repetitive wrist motions (frequent computer users)
 - 30%→ hand paresthesias
 - 10%→ clinical criteria for carpal tunnel syndrome
 - 3.5%→ abnormal nerve conduction studies

What... is it?



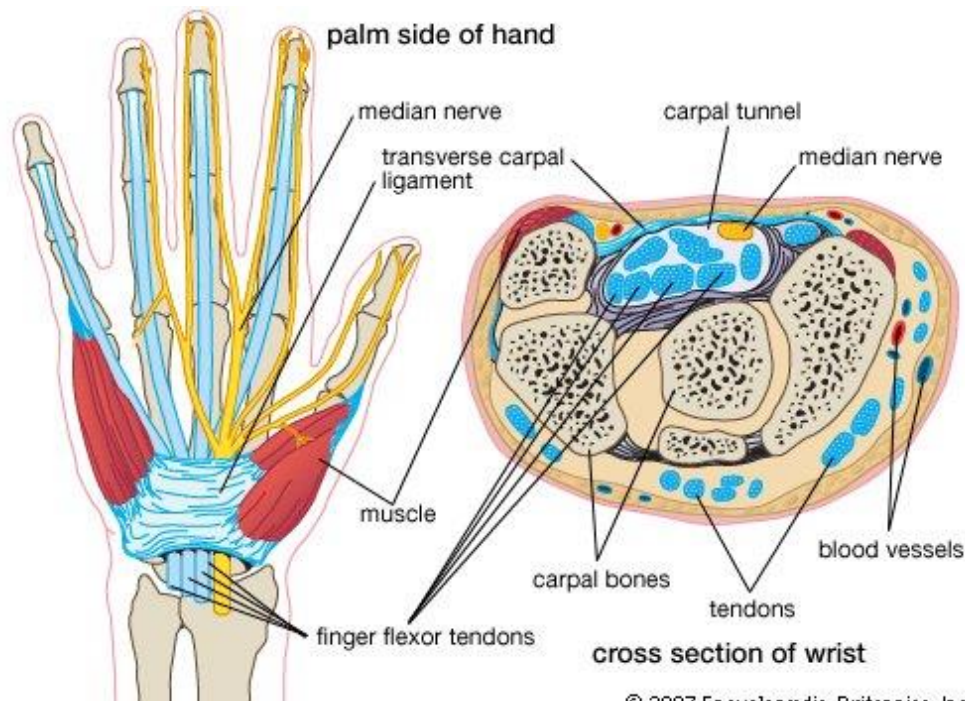
Carpal tunnel syndrome is a nerve compression syndrome where the median nerve gets compressed at the wrists

The carpal tunnel is formed between the carpal bones of the wrist and the transverse carpal ligament. The ligament is an unyielding thick fibrous tissue which does not allow for changes in volume within the carpal tunnel.



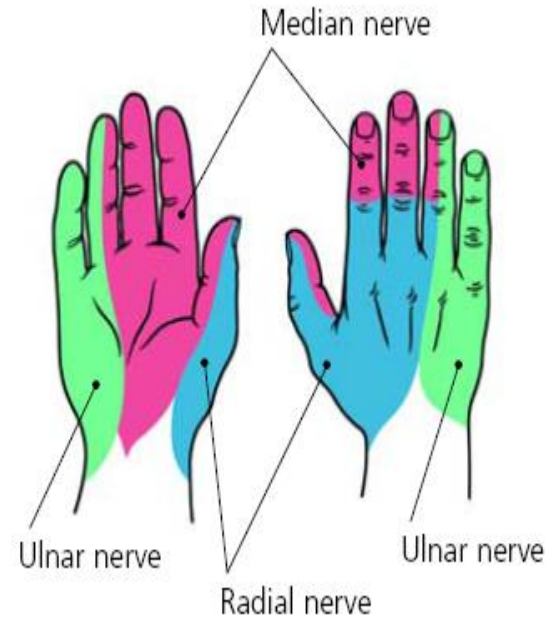
What are the symptoms?

The typical primary symptoms are pain and numbness and tingling the areas innervated by the median nerve. Symptoms are often worse at night and can be brought on by various activities that increase the pressure in the carpal tunnel (i.e. involving wrist flexion).



Clinical Features

- Pain
- Numbness
- Tingling
- Symptoms are usually worse at night and can awaken patients from sleep.
- To relieve the symptoms, patients often “flick” their wrist as if shaking down a thermometer (flick sign).



Clinical Features

- Pain and paresthesias may radiate to the forearm, elbow, and shoulder.
- Decreased grip strength may result in loss of dexterity, and thenar muscle atrophy may develop if the syndrome is severe or chronic in nature.

Thenar Atrophy



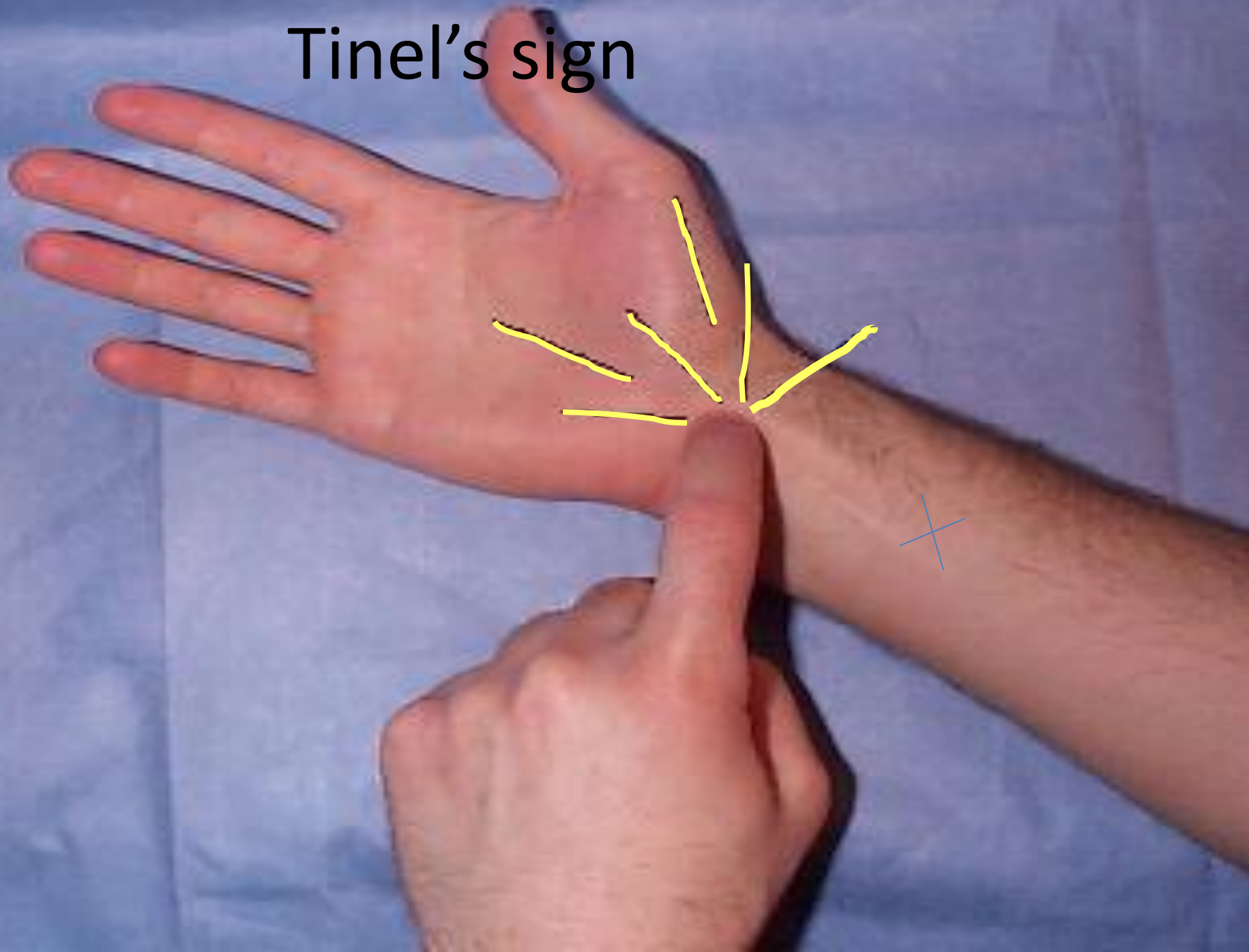
CTS examination

- Phalen's maneuver
- Tinel's sign
- weak thumb abduction.
- two-point discrimination

Phalen's maneuver



Tinel's sign



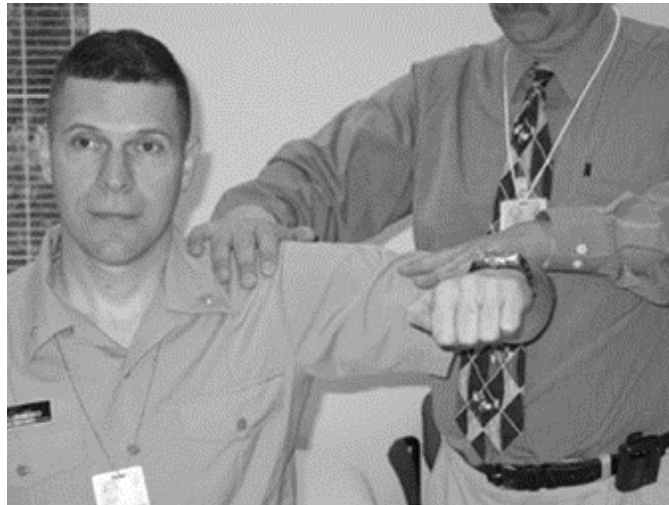
Muscle strength is often rated on a scale of 0/5 to 5/5 as follows:

- 0/5: no contraction
- 1/5: muscle flicker, but no movement
- 2/5: movement possible, but not against gravity (test the joint in its horizontal plane)
- 3/5: movement possible against gravity, but not against resistance by the examiner
- 4/5: movement possible against some resistance by the examiner (sometimes this category is subdivided further into $4^-/5$, $4/5$, and $4^+/5$)
- 5/5: normal strength



DELTOID Position of Patient: With the patient sitting the elbow should be flexed to indicate the neutral position of rotation.

Sample Instructions to Patient: "I am going to push down and I want you to resist me. Keep your arm up as I push down."



Position of Therapist: The therapist should stand at test side of patient and support abducted arm under the elbow and wrist if necessary.

Test: Patient attempts to bend the elbow with the hand supinated.

Sample Instructions to Patient: “Bend your elbow...”



Test: Support the patients forearm under the wrist while the other hand used for resistance is placed over the dorsal surface of the metacarpals. Do not permit full extension of the fingers.

Sample Instructions to Patient: “Bring your wrist up, hold it. Don’t let me push it down.”



GENERAL MEASURES

- Avoid repetitive wrist and hand motions that may exacerbate symptoms or make symptom relief difficult to achieve.
- Not use vibratory tools (weed eaters)
- Ergonomic measures to relieve symptoms depending on the motion that needs to be minimized (keyboards etc)

Predicting the Outcome of Conservative Treatment for Carpal Tunnel Syndrome

*Score 1 point for each "yes" answer and zero for each "no" answer. See the scoring key for the predicted successful outcome of conservative treatment.**

- | | | |
|---|-----------|----------|
| 1. Have symptoms been present for more than 10 months? | Yes _____ | No _____ |
| 2. Does the patient have constant paresthesias? | Yes _____ | No _____ |
| 3. Does the patient have flexor tenosynovitis ("triggering" of the digits)? | Yes _____ | No _____ |
| 4. Is Phalen's maneuver positive within less than 30 seconds? | Yes _____ | No _____ |
| 5. Is the patient older than 50 years? | Yes _____ | No _____ |

SCORING KEY: zero points = 65% success rate; 1 point = 41.4% success rate; 2 points = 16.7% success rate; 3 points = 6.8% success rate; 4 or 5 points = 0% success rate.

**—Outcome rates are based on the use of wrist splinting and nonsteroidal anti-inflammatory drugs; success rates may be higher with oral corticosteroid therapy or local corticosteroid injection.*

PREGNANCY

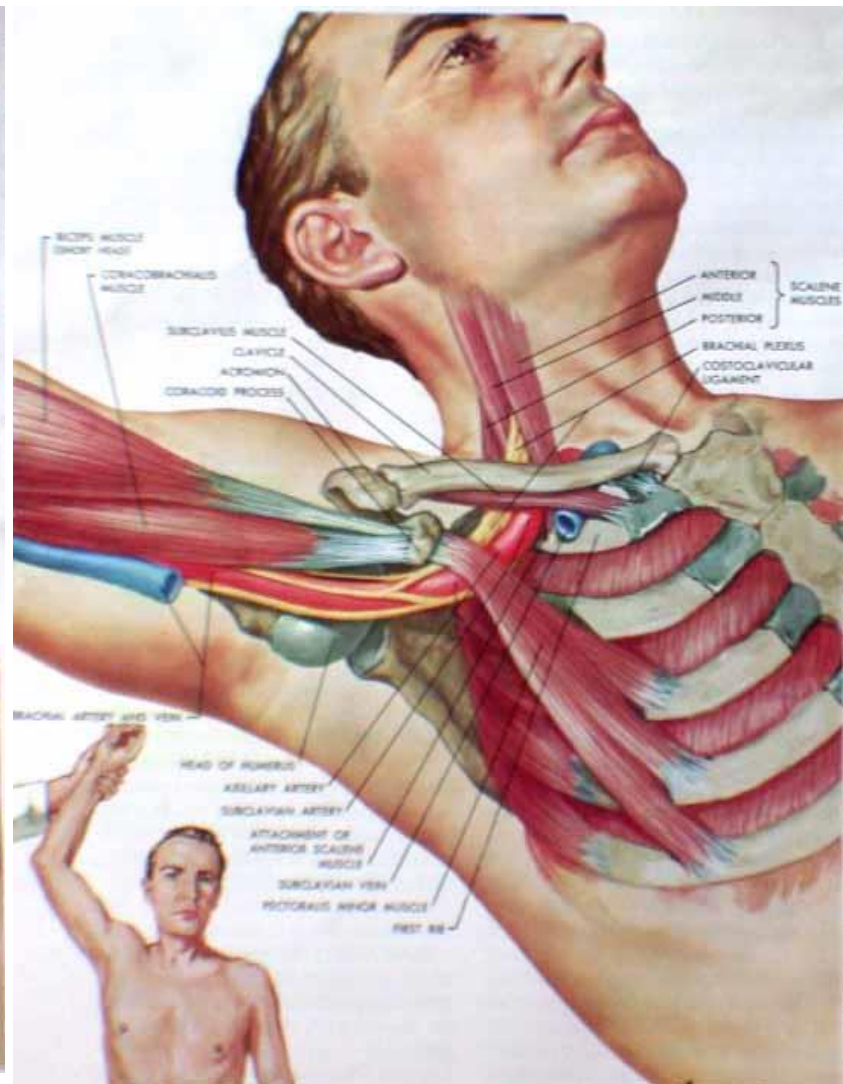
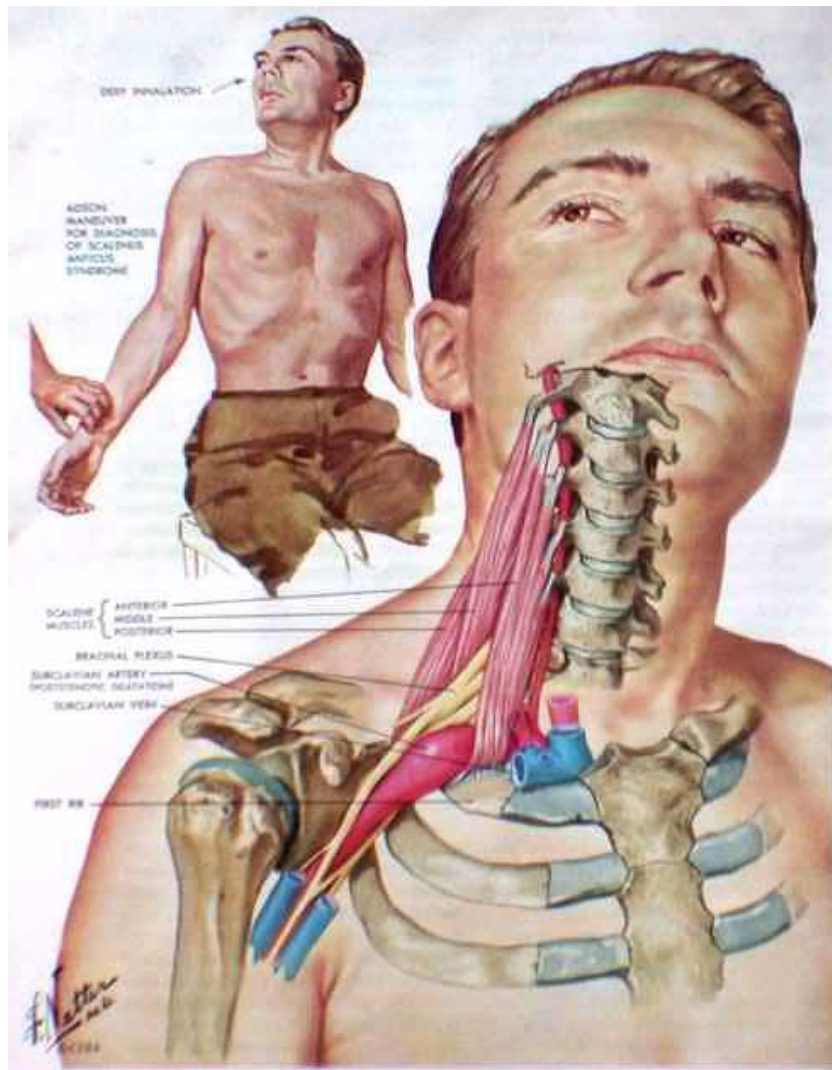
- Alterations in fluid balance may predispose some pregnant women to develop carpal tunnel syndrome.
- Symptoms are typically bilateral and first noted during the third trimester.
- Conservative measures are appropriate, because symptoms resolve after delivery in most women with pregnancy-related carpal tunnel syndrome.

It sounds like Carpal Tunnel but is it?



Hoof beats = horses to most, which means misdiagnosis to those of us who are ZEBRAS!

Plexus Disorders and TOS



Cervical Compression Test

Testing for: Compression of the cervical nerve root or facet joint irritation of the cervical spine.



Client presents with tingling going down unilateral or bilateral arms.

Is it a disc, facet, or peripheral entrapment due to fascia or muscle?



Jacksons test

Cervical Distraction:

Used after Cervical compression to relieve pressure on cervical nerve roots.



If Cerv compression caused pain and distraction relieved then client most likely has a disc/facet issue causing neural impingement.

If Cerv compression caused NO pain and distraction caused pain then client most likely has a spastic cervical muscle or peripheral entrapment.
MM stripping and stretching needs to be done.

Shoulder Depression Test

Positive:

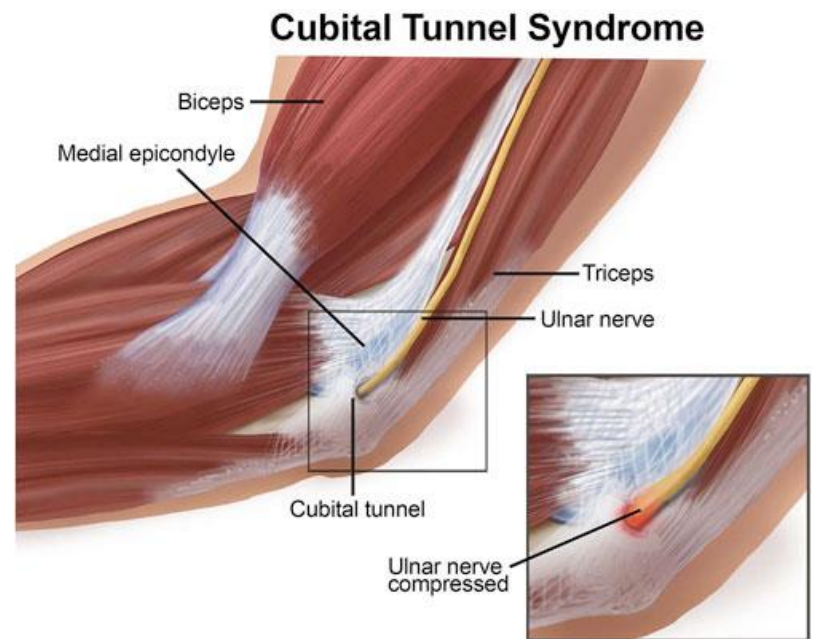
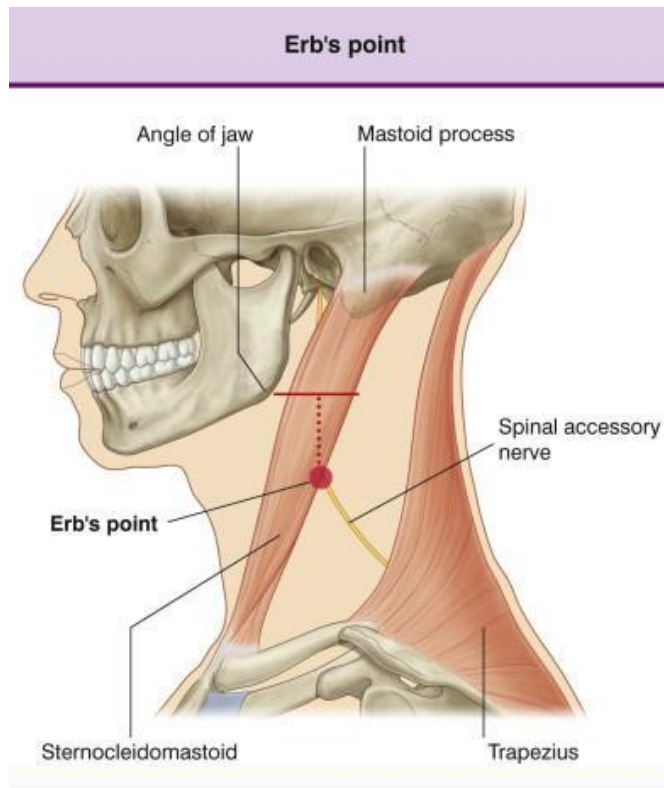
Pain on the side of the compression indicates irritation or compression nerve root or foraminal irritation.

Pain on the side of the stretch indicates hypomobile joint capsule or a nerve sleeve irritation or muscle splinting.

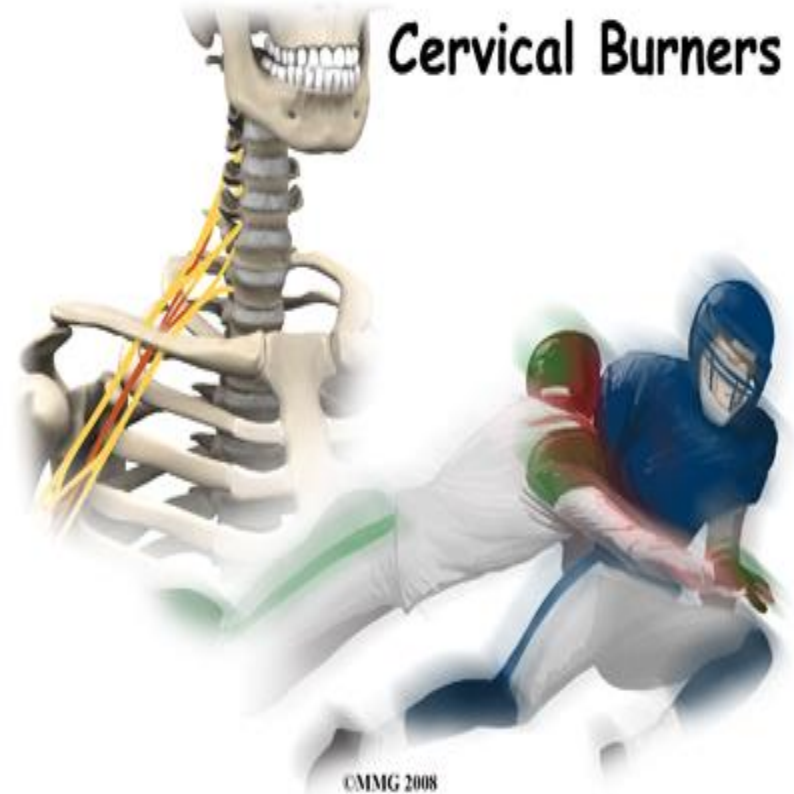


Double Crush

It can be often seen post-traumatically after whiplash injuries, as well as in patients who are commonly exposed to repetitive vibration. A positive Tinel's sign at multiple sites (i.e., Erb's point, cubital tunnel as well as the carpal tunnel) in combination with paresthesia, sensory deficits and grip weakness, can be suggestive of double crush syndrome.

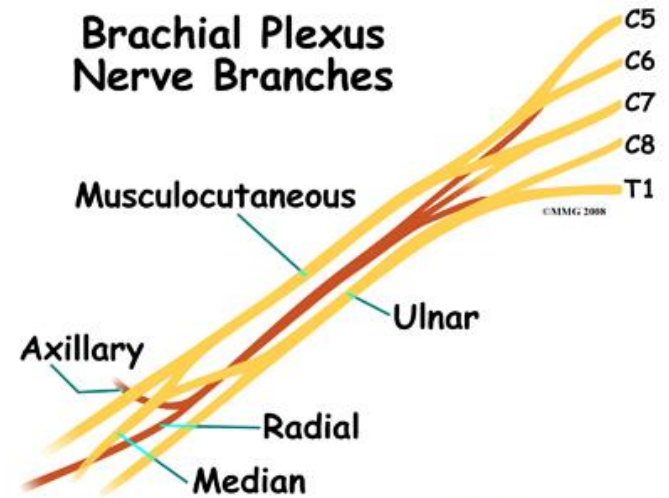


Injury to the nerves of the neck and shoulder that cause a burning or stinging feeling are called *burners* or *stingers*. Another name for this type of nerve injury is *brachial plexus injury*. Football players are affected most often. Up to half of all college football players have had at least one burner or stinger. Many of these occurred during high school football. Fortunately, it's not a serious neck injury.



Burners or stingers are the result of traction or compressive forces on the brachial plexus or cervical nerve roots. The usual mechanism of injury occurs when a direct blow or hard hit to the top of your shoulder pushes it down at the same time your head is forced to the opposite side. “Lateral Whiplash”

The shoulder and arm may feel numb or weak. You may feel as if this area is tingling. Weakness may be present at the time of the injury. Some patients report the arm feels and appears to be *dead*. This paralysis and other symptoms may be *transient* or temporary. They may only last a few seconds or minutes. But for some patients, healing takes days or weeks.



Neurogenic TOS

- Etiology
 - Hyperextension neck injury (whiplash)
 - Repetitive stress injuries (typing, assembly lines)
 - Falls on slippery floors/ice

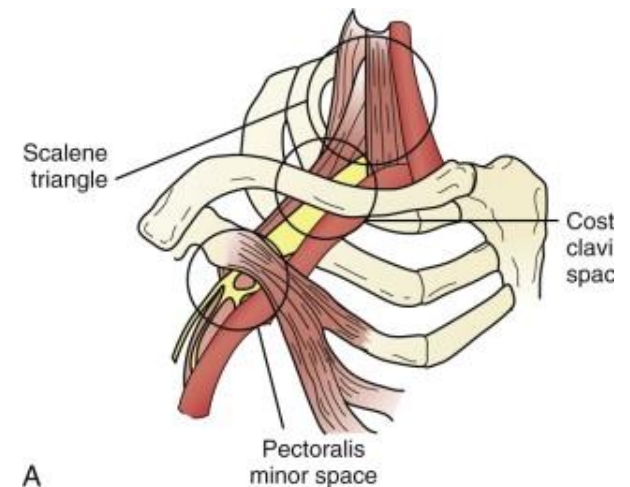


Neurogenic TOS

- Pathophysiology
 - Neck trauma stretches and tears scalene muscle fibers
 - Swelling of muscle belly → pain, parathesias, numbness, weakness
 - Scarring/fibrosis of muscle belly → occipital headaches, muscle spasms

Neurogenic TOS

- Pectoralis minor syndrome
 - Compression of neurovascular bundle under the pec minor
 - Pain over anterior chest and axilla
 - Fewer head/neck symptoms



Pec Intrapment



Working the Kinetic Chain



Release Sub-Occipitals First



Work Down Scalenes Second



Cautions For Scalene Work

Go cautiously and get feedback when working scalenes as this area may be very tender.

Technique Ant/Middle Scalenes

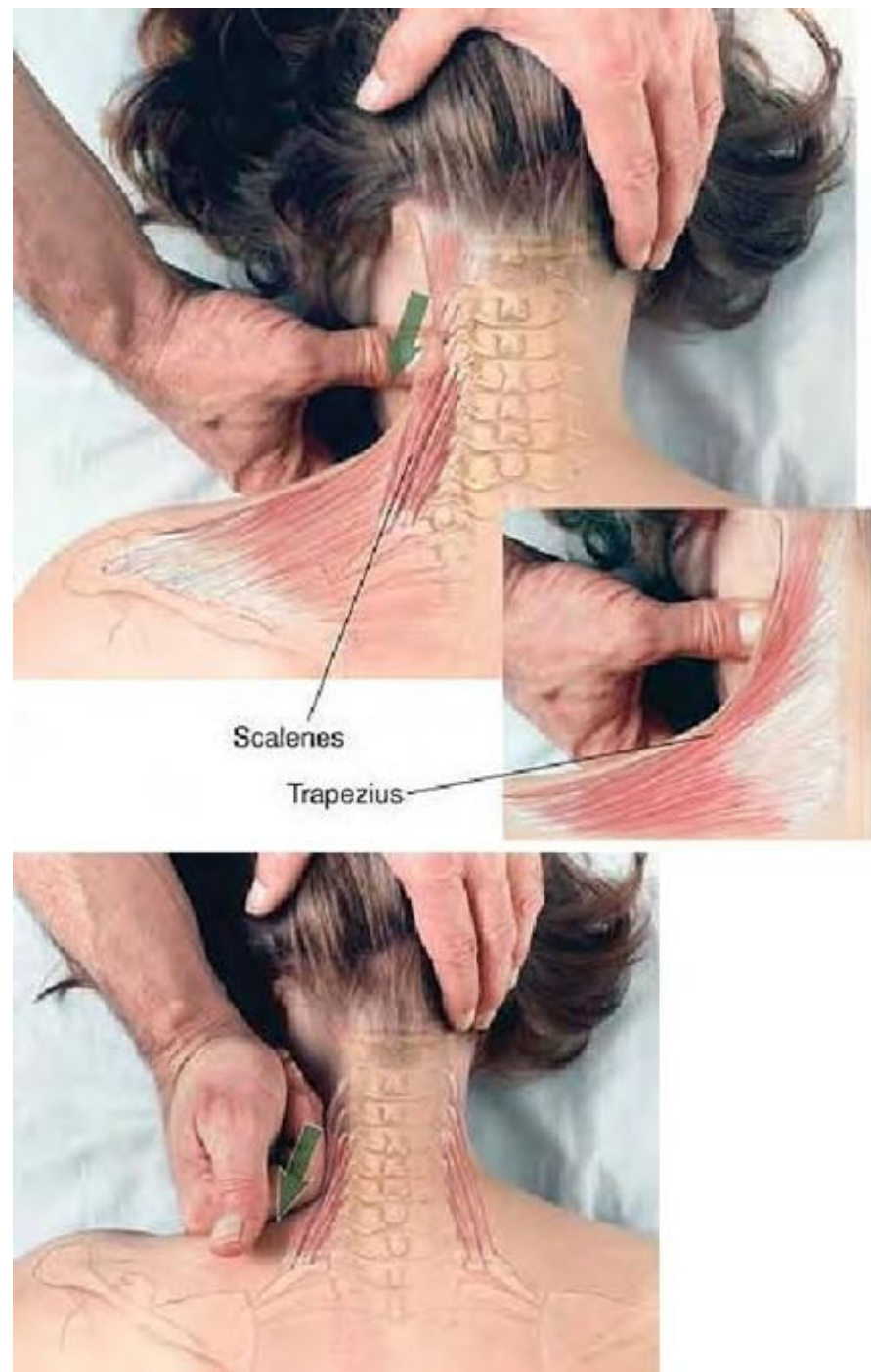
1. Work scalenes by rotating and flexing head toward affected side to minimize skin tension, then move thumb laterally under superior border of clavicle, moving from the sternum toward the acromion process.
2. Once muscles start to get loose then start gently rotating head away from involved side.



Working the Kinetic Chain Posterior Scalenes

Work from top down after releasing any TPs in sub-occipital region.

Pts head should be flexed approx 5 deg.



Working the Kinetic Chain Pecs



Working the Kinetic Chain

Biceps

Release the biceps (taking tension of bicipital aponeurosis). (Figure 7) If there is a strain in the bicipital aponeurosis treat that after releasing the biceps muscle belly. The median nerve will be held down by scar tissue in the bicipital aponeurosis if that is strained.



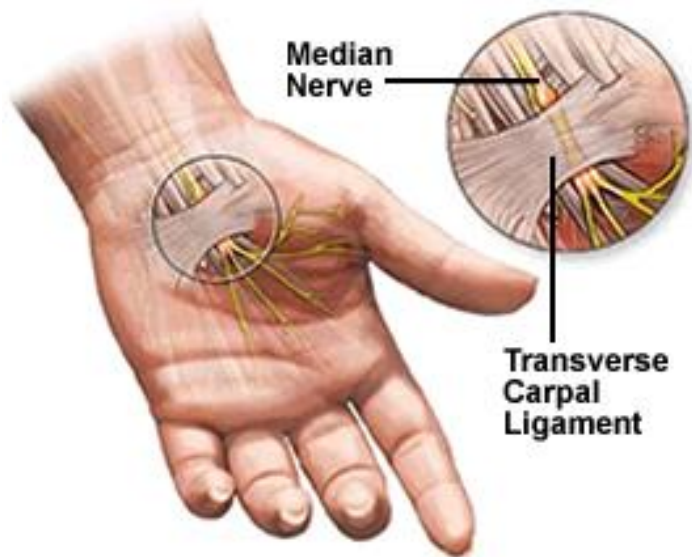
Pronator Teres Release. Keep in mind the median nerve passes through this muscle. In people that work on the computer, this is a posturally short muscle that often gets neglected in clients diagnosed with carpal tunnel problems.



Release the wrist and hand flexors. (Figure 9) There are nine tendons that pass from these muscles under the flexor retinaculum. Tension in the wrist flexors cause overdevelopment of their tendons, and can compress the median nerve under the tight flexor retinaculum leading to "true" carpal tunnel syndrome.



Free up the flexor retinaculum, and release individual tendon adhesions in the carpal tunnel. Active myofascial release is done by having the client spread and extend the fingers to help release the flexor retinaculum and flexor tendons in the tunnel.



Scalene Trigger Points



Ice Massage



Stretches



K Tape for Scalenes and Traps



<https://www.youtube.com/watch?v=Kp055-LkoFA>

<https://www.youtube.com/watch?v=SF6EoWCXIqk>

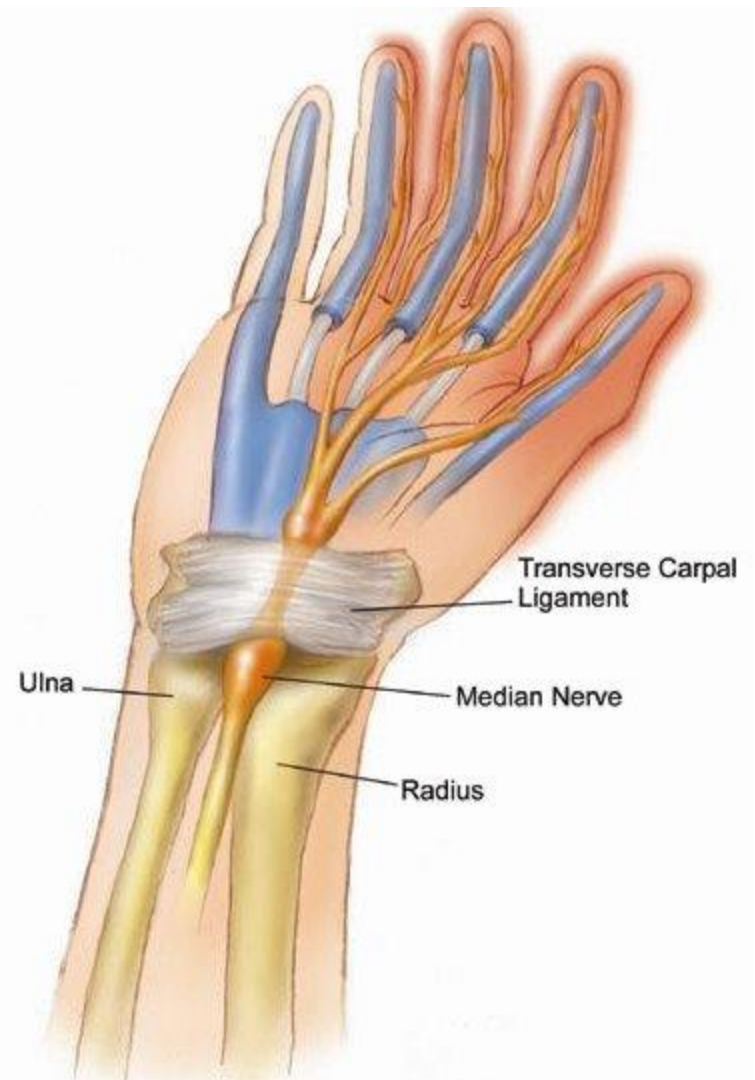
Carpal Tunnel Syndrome

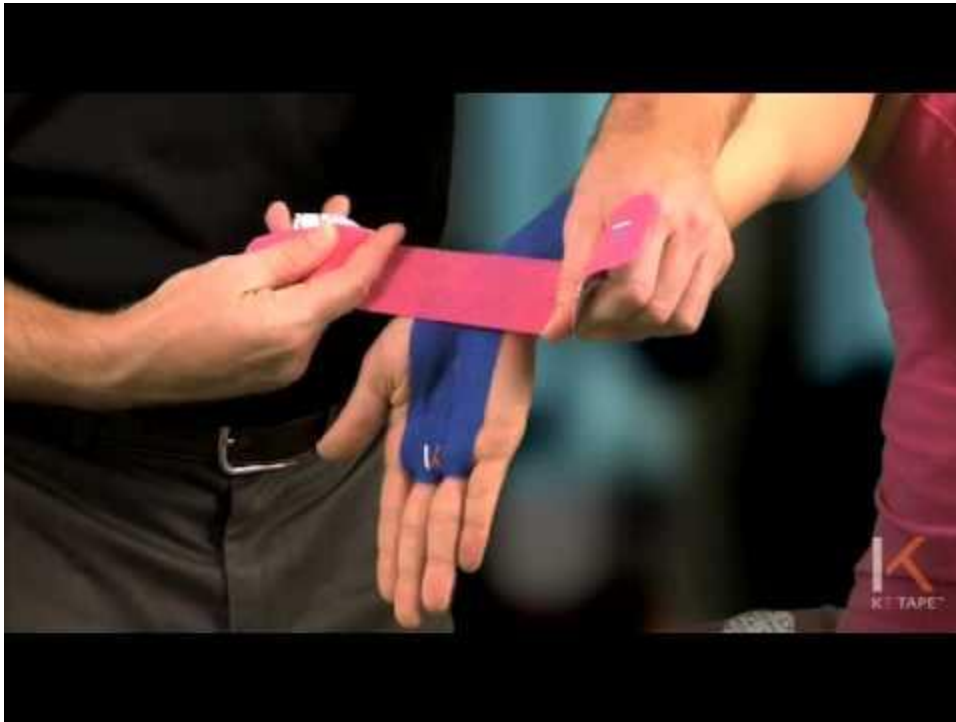
Step 1.

Step 2.

Step 3.

Copyright 2010 AresTape





http://www.youtube.com/watch?v=FAWu0_SWDhM

The End

CTS Mod 2
MMT Course