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# Cubital Tunnel Syndrome

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## Learning Outcomes

- As a result of this course, participants will be able to:
- 1) Describe diagnostic criteria for cubital tunnel syndrome
- 2) Delineate conservative measures to control symptoms
- 3) Identify appropriate therapy protocols following surgery to release the cubital tunnel

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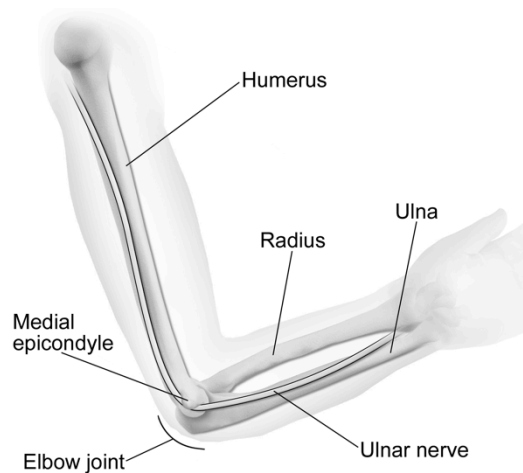
## Introduction to Cubital Tunnel Syndrome

Definition: Compression of the ulnar nerve at the elbow causing numbness and tingling in the ring and small fingers of the hand.

- Motor involvement occurs in more severe cases of nerve compression.
- The sensory deficits can be position dependent

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## Ulnar nerve- medial elbow



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Elbow and Ulnar Nerve

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## Types of Nerve Injuries

- **Neuropraxia** – localized pressure on the nerve (symptoms are reversible)
- **Axonotmesis** – neural tube is intact, but the axon is damaged (longer healing time with possibility of residual deficits)
- **Neurontomesis** – neural tube and axons disrupted (if nerve ends are surgically approximated, axon can recover)

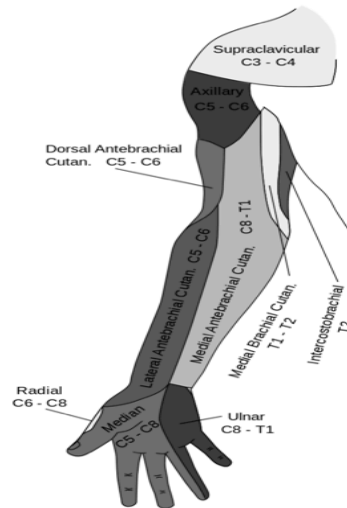
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## Kinds of Sensation

- Deep pain
- Vibration (tuning forks)
- Hot/cold
- 2 – point discrimination
- Moving touch
- Light touch

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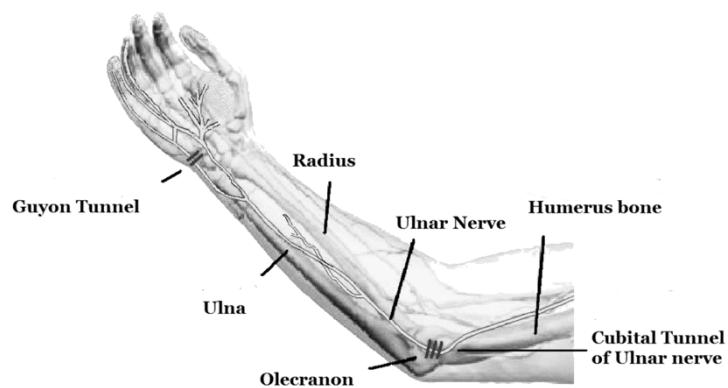
## Sensory Distribution



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## Ulnar Nerve



Dr. Harry Gouvas, MD, PhD-created this work entirely

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## Motor Innervations of the Ulnar n.

- In the forearm:
  - FCU
  - FDP to ring and small
- In the hand:
  - Hypothenar muscles (opponens digiti minimi, flexor digiti minimi, and abductor digiti minimi)
  - Both interossei (palmer and dorsal)
  - Lumbricals of ring and small
  - Adductor pollicis
  - Flexor pollicis brevis

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## Special tests

- Elbow flexion test – 30 seconds to one minute with the elbow fully flexed (Wadsworth sign)
  - Positive test is tingling in the ring and small finger to increase
- Tinel's – using a finger tip to percuss over the ulnar nerve as it exits the elbow
  - Positive test is a “zinging” sensation from elbow to hand

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## Special tests

- Hand posture in weak Claw Hand position
- Lumbrical MMT – intrinsic plus
- Index finger to thumb adduction MMT of adductor pollicis (Semple's test)

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## Froment's sign



Abnormal



Normal

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## Standardized tests

- Semmes Weinstein monofilament
- 2 point discrimination
- Grip strength
- Lateral pinch
- Tripod pinch
- AROM in flexion and extension and ABD/adduction of digits
- 9-hole peg test of fine motor coordination

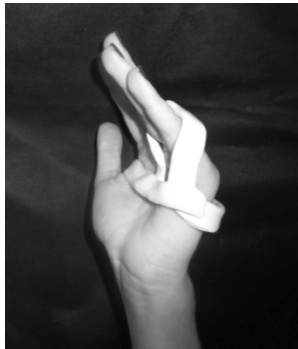
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## Differential diagnosis

- Compression in Guyon's canal
- Compression at hook of the hamate
- Cervical spine or brachial plexus compression

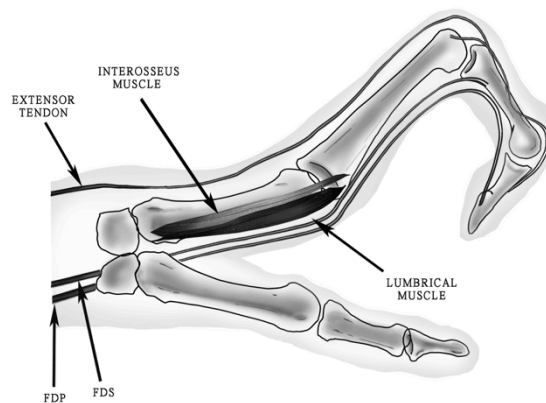
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## Claw hand



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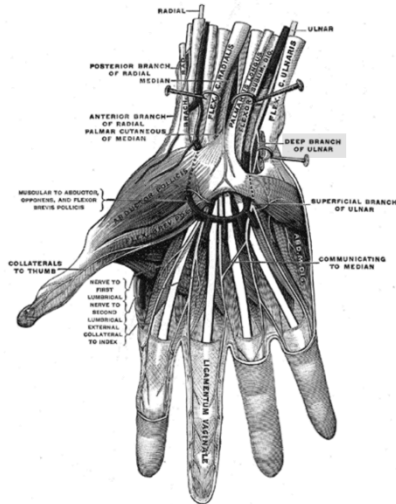
## Clawed digit



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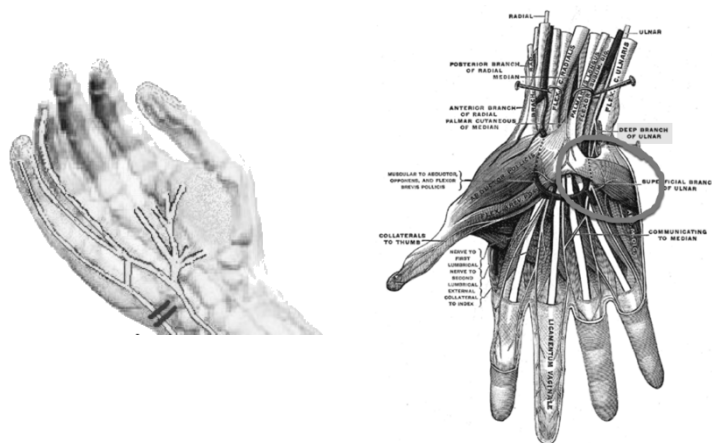
## Deep Terminal Branch



Henry Vandyke Carter  
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## Guyon's Canal



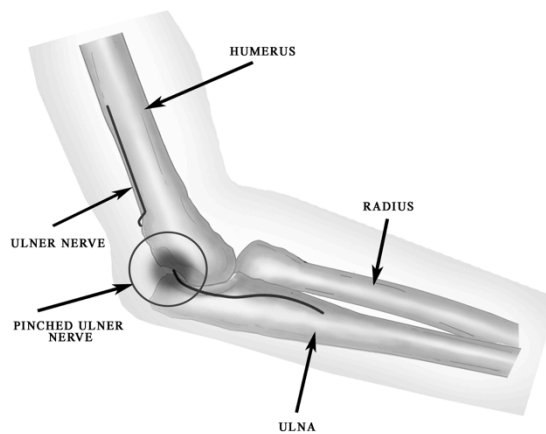
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## Causes of Cubital Tunnel Syndrome

- Continuous positioning with elbow flexed
- Direct Pressure (bumping or leaning on elbow)
- Hypertrophy of flexor/pronator muscle groups
- Subluxation of Ulnar nerve on medial epicondyle

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## Cubital Tunnel Syndrome



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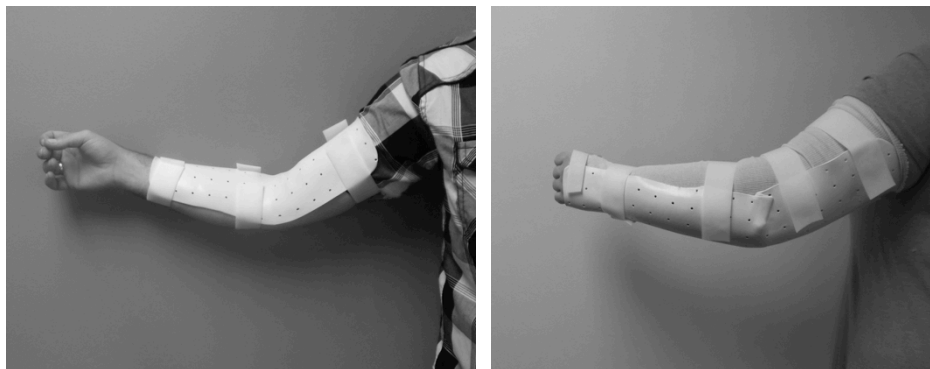
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## Conservative Treatment

- Prevent prolonged elbow flexion in daily activity
  - Headset for phone
  - Elbow extension orthosis for night (30-60°)
- Wear an elbow pad
- Stretch the wrist flexors and pronator
- Ulnar nerve glides

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## Cubital Tunnel Orthoses



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## Surgical Management

- In Situ decompression: Releasing the soft tissue holding the ulnar nerve in the cubital tunnel of the elbow
- Anterior Transposition: The nerve is moved out of the cubital tunnel so that the tension on it is reduced
- Submuscular Transposition: The nerve is placed under the flexor/pronator muscle groups ... in this case the muscles will have been cut and resisted pronation/wrist and digit flexion should not be performed strenuously too early.

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## Special Considerations after Surgery

- Sensory and motor deficits tested
- MMT of all potentially affected muscles
- “Turkey hand” picture is helpful for measuring progress of abduction
- Padded protection of elbow
- Activity modification to avoid prolonged tension
- Treatment of edema around surgical area with ultrasound or low level laser

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## Treatment of Deficits

- Strengthening of each of the muscle groups
- Desensitization/sensory re-education
- Scar management
- Motor coordination
- Nerve glide and tolerance for tension

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## Strengthening

- Pinch: pinch pins, putty/clay shaping, pick-up of small objects
- Finger abd/add: opening bands, spreading tissue, digging in rice
- Finger flexion: squeezing, gripping and holding tools (stirring, hammering, screw driver, scrubbing)

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## Desensitization

- Brushing over scar with soft cloth and lotion massage
- Digging hand into rice, beans, seeds
- Manipulating different texture objects with eyes closed
- Graded motor imagery

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## Scar Management

- Scar massage with lotion
- Scar mobilization for adhesions
- Scar therapy pads
- Light compression

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## Motor coordination

- Penny pick-up and in hand manipulation
- Finger fitness spheres
- Finger spelling in sign language
- Buttoning
- Tying

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## Finger fitness



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## Nerve Gliding

- Normal anatomy: elbow extension to flexion with supination, neutral wrist and shoulder abducted to 90°
- After volar transposition: wrist flexion and extension in supination, elbow extension and shoulder abduction to 90°

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## Ulnar Nerve Tension

- Lateral flexion of the head away from the target UE
- Shoulder external rotation and abduction
- Elbow flexion and pronation
- Wrist and finger extension

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## Questions?

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