

Carpal Tunnel Syndrome



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Carpal Tunnel Syndrome (CTS): compression of the median nerve as it passes through the carpal tunnel from the forearm into the hand. It is the most common site of nerve entrapment in the body.

Risk factors:

- Obesity
- Repetitive wrist work
- Pregnancy
- Hypothyroidism

Pathophysiology:

- Median nerve compression may result in ischaemia, focal demyelination, decrease in axonal integrity and eventual axonal loss
- Longstanding CTS can lead to atrophy of the thenar muscles (**OAF** - **O**pponens pollicis, **A**bductor pollicis and [superficial head] of **F**lexor pollicis brevis)
- Thumb flexion still possible as flexor pollicis longus is innervated by the ant. interosseous branch of the median nerve & deep head of flexor pollicis brevis is innervated by the ulnar nerve
- Thumb adduction spared as adductor pollicis is supplied by the ulnar nerve
- **Clinical pearl:** True CTS will not present with loss of palmar sensation. Rationale: superficial sensory branch of the median nerve, which provides sensation to the base of the palm, branches proximal to the carpal tunnel and travels superficial to it.

Presentation

- Tingling, numbness, altered sensation, burning or pain in the palmar surface and fingertips of the lateral three and half digits
- Symptoms often worse at night
- Symptoms eased by shaking hand
- Diminished manual dexterity during ADLs
- Pain can also occur proximally in forearm, elbow, shoulder and neck in 33% of patients (**Double crush phenomenon**)

Diagnosis

- Thenar muscle wasting
- Sensory loss in the lateral three and half digits
- Reduced strength of thumb abductors
- Use a cluster of **Phalen's**, **Reverse Phalen's**, **Tinel's**, **Hand elevation** and the **Carpal Tunnel Compression test**
- Further diagnostic investigations: electromyography and nerve conduction velocity test



Management

- **Wrist splint** - to keep wrist in neutral position. To be worn at night and during activities that stress wrist joint
- **Education and activity modification** – provide verbal guidance and written information to patient. Education includes: associated risks, ergonomics, self-management. Modifications include: avoiding vibration tools, pacing repetitive tasks that elicit symptoms, avoiding long periods of time with the wrist in extreme flexion/extension
- **Nerve and tendon gliding exercise** - joint, tendon and nerve mobilisations may reduce oedema
- **Corticosteroid injection**

Want to learn more?

With AcePhysio the learning journey doesn't stop here! Take a look at our further reading recommendations below to become an expert in CTS:

1. Padua et al 2016. Carpal Tunnel syndrome: clinical features, diagnosis and management. *Lancet Neurology*. 15: 1273 -84
2. American Academy of Orthopaedic Surgeons. Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. www.aaos.org/ctsguideline. Published February 29, 2016.
3. Commissioning guide: Treatment of Carpal Tunnel Syndrome, 2017. Royal College of Surgeons