

UE Nerve Pathology

Radial Nerve Entrapment

Spiral Groove of Humerus

Relevant to clinical practice as the radial nerve can be injured here in the event of a humeral fracture. Will lead to paralysis of all forearm extensors, wrist drop, and numbness to the posterior aspect of the hand. Also clinically relevant in the event of prolonged crutch usage with excessive compression forces to the radial nerve.

(http://www.wheelsonline.com/ortho/radial_nerve_palsy_following_fr_x_of_the_humerus)

Posterior Interosseous Syndrome

After the radial nerve splits into the superficial and deep portions, the posterior interosseous nerve can become entrapped as it courses through the supinator muscle in the **Arcade of Froese**. This is said to occur in roughly 30% of the population. This condition leads only to pain and in advanced cases motor symptoms of the posterior forearm as the posterior interosseous nerve has no sensory component.

However, because the extensor carpi radialis longus and in some cases the extensor carpi radialis brevis are innervated before the radial nerve passes into the supinator, there is usually some sparing of wrist extension.

([http://www.physio-pedia.com/Posterior Interosseus Syndrome](http://www.physio-pedia.com/Posterior_Interosseus_Syndrome))

Superficial Radial Nerve Syndrome (Wartenberg's disease)

Entrapment of the superficial branch of the radial nerve. Wartenberg's disease will present with pain and sensory manifestations without motor deficits as it is only the superficial branch of the radial nerve affected. The superficial branch of the radial nerve can be compressed at any point along its course in the forearm, but it is most commonly believed to be at greatest risk at the posterior border of the brachioradialis muscle as the nerve changes from a deep to a subcutaneous path.

([http://www.physio-pedia.com/Wartenberg's Syndrome](http://www.physio-pedia.com/Wartenberg's_Syndrome))

Median Nerve Entrapment

Pronator Teres syndrome

Compression of the median nerve at the elbow as it passes underneath the pronator teres muscle. This condition is not as common as Carpal Tunnel Syndrome (CTS). Compression of the median nerve at this location in the elbow can lead to pain, numbness in the distribution of the distal median nerve distal to the elbow, and weakness can develop in the flexor pollicis longus and the radial half of the flexor digitorum profundus which controls the DIP flexion in the 2nd and 3rd digit. Resisted pronation will usually elicit symptoms in pronator teres syndrome.

([http://www.physio-pedia.com/Pronator Teres Syndrome Test](http://www.physio-pedia.com/Pronator_Teres_Syndrome_Test))

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Carpal Tunnel Syndrome

Compression of the Median nerve as it passes through the carpal tunnel at the wrist. CTS has an estimated prevalence of 4-5% of the population, usually affects people between 40 and 60 years, and is more common in women who are pregnant due to a hypothesis of fluid retention leading to increased pressure on the Median nerve in the carpal tunnel. A **diagnostic cluster** has been proposed by Wainner et al in 2005. This cluster consisted of 1 question (shaking hands for symptom relief), wrist-ratio index greater than .67, Symptom Severity Scale score greater than 1.9, reduced median sensory field of digit 1, and age greater than 45 years. The likelihood ratio for the CPR was 18.3 when all 5 tests were positive. ([http://www.physio-pedia.com/Carpal Tunnel Syndrome#cite_note-Wainner-20](http://www.physio-pedia.com/Carpal_Tunnel_Syndrome#cite_note-Wainner-20))

(Wainner RS, Fritz JM, Irrgang JJ, Delitto A, Allison S, Boninger ML. Development of a clinical prediction rule for the diagnosis of carpal tunnel syndrome. Arch Phys Med Rehabil. 2005;86(4):609-18.)

Anterior Interosseous Nerve Syndrome

AINS is a purely motor condition, as the anterior interosseous nerve contains no sensory fibres. There may be complaints of diffuse pain in the anterior forearm. Diagnostically, patients fail to make an “O.K.”-sign, as flexion of the interphalangeal joint of the thumb and

the distal interphalangeal joint of the index finger is impaired due to decreased motor input to the radial half of the FDP as well as FPL. A secondary diagnostic test is the **pinch test**: a patient with AINS will also not be able to pinch a sheet of paper between his thumb and index finger, instead clamping the sheet between his extended thumb and index fingers. Think “pad to pad” instead of “tip to tip”.

(<http://www.orthobullets.com/hand/6019/ain-compressive-neuropathy>)

Ulnar Nerve Entrapment

Cubital tunnel syndrome

Irritation or injury to the ulnar nerve as it passes through the cubital tunnel at the elbow. CTS presents with pain and/or paraesthesia in the fourth and fifth fingers as well as pain in the ulnar aspect of the elbow which may extend proximally or distally. CTS is the second most commonly reported upper extremity entrapment neuropathy and is the most common ulnar nerve neuropathy. May presents with atrophy of the intrinsic muscles of the hand. Demonstrable risk factors include age older than 40, overhead throwers, work that involves prolonged periods of elbow flexion such as holding a telephone, resting elbows on a hard surface, and obesity. Exam with Tinel’s test, ULTT for Ulnar nerve, and elbow flexion test.

([http://www.physio-pedia.com/Cubital Tunnel Syndrome](http://www.physio-pedia.com/Cubital_Tunnel_Syndrome))

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Guyon's Canal syndrome

Ulnar nerve becomes entrapped between the hook of the hamate and the transverse carpal ligament which makes up the Guyon's canal. Most often considered an overuse injury which is caused by direct pressure on a handlebar (ie. Bicycle handlebar, weight lifting, construction equipment) and therefore, is sometimes referred to as "handle bar palsy". It can also result from excessive gripping, twisting, or repeated wrist and hand motions. Symptoms caused by this syndrome usually consist of muscular atrophy of the hypothenar muscles and interossei with muscle sparing of the thenar group. May have weakened thumb adductor (adductor pollicis) and often presents with sensory loss and pain in the palmar surface of the fifth digit and medial aspect of the fourth digit. In advanced cases, may present with Ulnar Claw sign (sign of Benediction). Special testing can include Froment's Sign, Tinnel's sign at Guyon's canal, and ULTT for Ulnar nerve. (http://www.physio-pedia.com/Ulnar_Nerve_Entrapment)

Other

Parsonage-Turner Syndrome

PTS is the term used to describe a neuritis involving the brachial plexus, and is also referred to as idiopathic brachial plexopathy or neuralgic amyotrophy. It may present with symptoms of an isolated peripheral nerve lesion, although the pathology is thought to lie more proximally. PTS is a rare disorder that generally involves one upper limb, mostly the axillary nerve, the upper trunk of the brachial plexus, the suprascapular nerve, and the long thoracic nerve are affected.

(http://www.physio-pedia.com/Parsonage-Turner_Syndrome)

(Sumner AJ. Idiopathic brachial neuritis. Neurosurgery. 2009;65(4 Suppl):A150-2.)