Nerves of the Upper Limb

Brachial plexus begins in the neck, extends into the axilla then passes inferior to the clavicle (between divisions & cords). Musculocutaneous, median & ulnar (lateral to medial) form an ‘M’ shape that lies superior to the axillary artery and the axillary & radial nerve lie deep to it. The ulnar nerve is anterior & passes posterior to the medial epicondyle and the radial nerve is posterior & passes anterior to the lateral epicondyle.

Superior Brachial Plexus Injury (Erb Duchenne Palsy) – Stretching causing paralysis of C5, C6 muscles; presents with waiter’s tip (arm medially rotated, extended at elbow & adducted) and sensory loss in lateral arm & forearm

Inferior Brachial Plexus Injury (Klumpke’s Palsy) – Sudden pull on upper limb causing paralysis of C8, T1 muscles; present with ulnar claw (short muscles of hand affected)

Musculocutaneous Nerve (C5, C6, C7)
- Stab wound to axilla, hypertrophy or entrapment paralyses anterior arm muscles, weakens flexion at shoulder and elbow & supination of forearm; also loss of sensation of lateral side of forearm

Axillary Nerve (C5, C6)
- May be damaged by anterior dislocation of humerus or surgical neck fracture; abduction of arm not possible and loss of sensation in regimental badge area

Radial Nerve (C5, C6, C7, C8, T1)
- Dislocation or proximal humeral fracture can paralyse posterior arm muscles making extension of entire limb impossible; wrist drop & loss of cutaneous sensation
- Midshaft humeral fracture paralyses all muscles but the majority of the triceps; can extend at elbow but not below and there is loss of sensation on dorsum of hand only
- Radial head fractures or posterior dislocation of elbow paralyses most of posterior forearm but wrist drop does not occur as extensor carpi radialis longus is unaffected
- Laceration of forearm leads to sensory loss on dorsum of hand

Median Nerve (C6, C7, C8, T1)
- Supraepicondylar fracture paralyses flexors & pronators (except those innervated by ulnar nerve) meaning forearm constantly supinated, flexion is weak and flexion of thumb, 2nd & 3rd digits is not possible. Present with Hand of Benediction when trying to make fist
- Laceration proximal to flexor retinaculum paralyses lateral two lumbricals & thenar muscles; presents with Hand of Benediction when trying to make fist

Ulnar Nerve (C8, T1)
- Medial epicondyle fracture weakens flexion of wrist, 4th & 5th digits and paralyses interossei meaning patients unable to grip paper between fingers
- Laceration at wrist paralyses interossei and weakens movement of 4th & 5th digits; in long term ulnar claw develops
- Ulnar Paradox – At elbow FDP is paralysed but not at this wrist, causing lateral two digits to gradually flex (ulnar claw) if damage occurs at wrist; ulnar nerve damage at wrist looks worse than at the elbow (which is actually worse)
- Handlebar Neuropathy – Compression of ulnar nerve by hook of hamate during long cycles leading to sensory loss on medial side of the hand and weakness of intrinsic hand muscle

A way to remember the parts of the brachial plexus:
- Roots, trunks, divisions, cords, nerves
- Rubbing Tony’s d*ck causes necrosis