

# Nerves of the Upper Limb & the Effects of their Injuries

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# Questions

- What nerves are produced from the posterior cord of the brachial plexus?
  - Axillary nerve
  - Radial nerve
- Where is the axillary nerve susceptible to injury in the arm?
  - Surgical neck of humerus
- The median nerve consists of which nerve roots?
  - C5-C8, T1
- Which side should carpal tunnel decompression occur? Ulnar or radial and why?
  - Ulnar side to avoid the median nerve which runs on radial side of FDS, and usually gives a motor branch to thenar muscles on radial side



- Which nerve is affected if pt has sensory loss over deltoid area?
  - Axillary nerve
  - Deltoid will be weak

# Brachial Plexus

- 5 Roots
  - 3 Trunks
  - 6 Divisions (anterior & posterior)
  - 3 Cords (respect to axillary artery)
  - 5 Branches
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- Ventral rami of spinal nerves
  - Real Teenagers Drink Cold Beer

# Nerves

- Musculocutaneous nerve
- Median nerve
- Axillary nerve
- Radial nerve
- Ulnar nerve

# Brachial Plexus Injuries

- Erb-Duchenne Palsy (1870s)
  - C5, C6 nerve roots
  - Waiter's tip position
  - Medial rotation, forearm pronation, wrist flexion
- Adult Traction Injury (Klumpke's Palsy, 1885)
  - C8, T1 nerve roots
  - Clawed hand
  - Ulnar flexors, intrinsic muscles
- Traumatic or obstetric

# Long Thoracic Nerve

- Roots of C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>
- Serratus anterior
- Winged scapula

# Median Nerve Injury

- Above Wrist
- Elbow dislocation, pronator teres nerve entrapment syndrome, forearm #'s
- At Wrist
- Carpal tunnel syndrome, lacerations
  - Thenar eminence
  - Sensory loss
  - Beware pre-carpal tunnel cutaneous branch

# Median Nerve

- Course
  - Beneath Flexor retinaculum on radial side
  - Palmaris longus
  - Behind FDS
- Motor Function
- Sensory Function
  
- At risk – distal humerus

- Lateral & medial cords
- Flexor compartment of forearm
- Anterior interosseous n supplies deep muscles (FPL, PQ, ½ FDP)
- Thenar eminence, lateral 2 lumbricals

# Radial Nerve

- Course
  - Spiral groove
  - Deep to brachioradialis
  - Anterior to lateral epicondyle
  - Superficial sensory and deep posterior interosseous motor branches
- Motor Function
- Sensory Function
- At risk – spiral groove of humerus

# Radial nerve

- Posterior cord
- Enter anterior compartment of forearm
- Gives off posterior interosseous nerve which supplies extensor compartment of forearm
- Posterior cutaneous n of arm, lower lateral cutaneous n., posterior cutaneous n of forearm, superficial radial nerve

# Radial Nerve Injuries

- Axilla Injury
  - “Saturday Night Palsy”, Ill-fitting crutches
- Mid-Humerus
  - #’s, tourniquet palsy
- At or Below Elbow
  - Elbow Dislocations, surgical trauma, in supinator tunnel

# Ulnar Nerve

- Course
  - Posterior compartment of arm
  - Between FCU & FDP
  - In front of flexor retinaculum
  - Superficial and deep branch
- Motor Function
- Sensory Function
  
- At risk – medial epicondyle of humerus

- Medial cord
- Anterior compartment to mid humerus, then in posterior compartment
- Lies deep to FCU, and lateral to its tendon
- Palmar and dorsal cutaneous branch before entering hand to supply intrinsic muscles.

# Ulnar Nerve Injuries

- At the Elbow
- At the Wrist
  
- Tardy Ulnar Nerve Palsy
- Ulnar Neuritis & Ulnar Tunnel Syndrome



# Cutaneous Nerves

# Axillary Nerve

- At risk - Surgical neck of humerus
- Beware during lateral approach to shoulder - winds around humerus ~5cm below lateral border of acromion
- Posterior cord of plexus
- Supplies deltoid, teres minor, shoulder joint
- Upper lateral cutaneous nerve of arm (regimental badge)

# Musculocutaneous Nerve

- Protect nerve during coracoid osteotomy during anterior approach to shoulder
- Lateral & medial cords
- Flexes elbow
- Supplies coracobrachialis, biceps, brachialis
- Lateral cutaneous nerve of forearm