

Orthopedic testing of the Spine

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Neurological C5

Nerve passes between vertebrae C4 and C5

Deltoid is a pure C5 muscle. (axillary nerve)

Biceps is both C5 and C6

Primary shoulder abductors are middle portion of the Deltoid and the supraspinatous (suprascapular nerve C5, C6) –

Muscle testing - Stand behind the patient. Stabilize the acromion. Put elbow at his side. Flex elbow 90 degrees. As he abducts to 90 degrees, gradually increase your resistance to the motion. Grade muscle strength.

Test biceps - (Musculocutaneous Nerve) a flexor of the shoulder and elbow and supinator of the forearm. Picture a man driving a cork into a bottle of wine, pulling out the cork and drinking the wine. Test only for elbow flexion. Brachialis muscle is also C5. With one hand stabilize elbow standing in front and cupping your hand around the posterior aspect of the elbow. Forearm must remain in supination. Flex arm slowly. Apply resistance as he approaches 45 degrees.

Reflex – Biceps - Mainly C5 lesser C6 needs only be slightly reduced in comparison. Five fingers come up at C5

Sensory – Lateral aspect of the deltoid is most pure area.

Neurologic C6

Nerve passes between C5 and C6

Muscle testing –Wrist extension - not pure as there is a C7 component

Extensor carpi radialis C6 and ulnaris C7 With C6 denervation the wrist will deviate toward the ulnar side during extension. Test with resistance after the wrist is in full extension. Normally you will be unable to move it. Compare. Radial nerve.

Reflex– Brachioradialisreflex C6 - radial nerve. Biceps may be affected (both C5 and C6)

Sensation – Lateral forearm, the thumb, the index finger and one half of the middle finger. Form a figure six with your thumb and index finger while extending your middle finger.

Neurologic C7

Nerve passes between vertebrae C6 and C 7

Muscle Testing - Triceps, wrist flexors and finger extensors are C7 predominately.

- A. A.Triceps is the primary elbow extensor. Have him extend his arm from a flexed position while stabilizing just proximal to the elbow. Before 90 Degrees start to resist. If weaker than grade 3 test in a gravity free plane. This muscle permits him to use a crutch or cane.

B. B. Wrist flexors. – Flexor carpi radialis C7, Ulnaris C8. Make a fist. This removes the influence of the finger flexors. Now have him flex his wrist. Try to pull it out of the flexed position while stabilizing the wrist with the other hand.

C. Now test for finger extension – Extensor digitorum communis, indicis proprius, digiti minimi. Extend the MCP joints but flex slightly the interphalangeal joints. Pressure is down over the proximal fingers.

Reflexes. Triceps

Sensation-middle finger usually. Occasionally it is innervated by C6 or C8.

Neurologic C8

Nerve exits between vertebrae C7 and T1

Muscle Testing

Finger flexors –

Flexor digitorum superficialis, profundus, lumbricals (C8 and T1)

The profundus flexes the DIP, the lumbricals the MCP. C8 nerve root affects all the finger flexors but a peripheral injury to the ulnar nerve affects only digits 4 and 5. as there is medial innervation as well. Four of your finger curled into four of his.

Reflexes - None

Sensation– Distal medial half of forearm (anatomic position) and digits four and five.

Neurologic T1

Nerve passes between T1 and T2

Muscle testing –

Finger abductors – Interossei and abductor digiti quinti. – Ulnar nerve, T1

Reflexes – None

Sensation – Medial brachioradial nerve – Upper half of the medial forearm and medial portion of the arm.

Sensation T2 - Axilla

222

In summary: All motor testing except C5 can be done on the wrist and fingers.

C6 is performed by testing wrist extension,

C7 by wrist flexion and finger extension,

C8 by finger flexion and

T1 by finger abduction and adduction.

Reflexes –

C5 – Biceps

C6 – Brachioradialis

C7 - Triceps

5 - Normal, **Good**- 4 with some resistance, **Fair**- 3 against gravity, **Poor** – 2 Complete ROM eliminated, **1** - evidence of contractility only. **0** - no contractility.