Nerve Conduction studies

Upper limb sensory studies

Lateral antebrachial cutaneous (disc electrodes)

A: from cubital crease just lateral to the biceps tendon 14 cm along line to radial stylid

R: 4 cm distal to active

G: forearem medial to the active and reference electrodes

Stim: cubital crease lateral to biceps tendon

Point of caution: aim the stimulator toward the biceps tendon

Medial antebrachial cutaneous (disc electrodes)

A: from cubital crease 14 cm distal on the anteromedial surface of the forearm , 2-3 cm lateral to the medial epicondyle, on a line connecting point of stimulation to the pisiform

R: 4 cm distal to the active

G: forearm lateral to the active and reference electrodes

Stim: cubital crease on the nerve 2-3 cm lateral to medial epicondyle

Point of caution: avoid stimulation of median or ulnar nerve in the area

Radial (first web space) sensory (disc electrodes)

A: first web space at extensor pollicis longus tendon whre the radial sensory branches cross the tendon from lateral to medial side of the wrist.

R: thumb or index finger at least 4 cm distal tot the active electrode

G: anterior wrist

Stim: 10 cm along radius anterolaterally to the ulnar edge of the radius

Point of caution: keep the forearm in semipronation for stimulation. Palpate the nerve on the extensor pollicis longus tendon after extension of the thumb utilising the pad of your thumb

Median H reflex:

A: flexor carpi radialsi belly at 1/3rd distance between medial epicondyle and radial styloid or 4 finberbreath distal along the line that joins midpoint between biceps tendon and medial epicondyle tot the radial styloid

R: 4 cm distally over the flexor carpi radialis or over the brachioradialis

G: over the forearm just proximal to the active electrode

Stim: median nerve at the elbow with cathode proximal with elbow flexed approximately 30 degrees with stimulus duration of 0,5 to 1 ms and stimulus rate of once every 2 sec

Point of caution: start the stimulus at 3 mA and increase 0,5 mA at a time to increase gradually to obtain maximum amplitude of the H reflex response

F-wave:

A: APB, ADM as in the nerve conduction study for median, ulnar nerves

R: as in the median , ulnar nerve conduction studies

G: as in the median, ulnar nerve conduction studies

Stim: Wrist as in the nerve conduction studies with supramaximal stimulation

Point of Caution: there is no need to reverse the cathode and anode to obtain the F wave responses. Record at least 20 responses to obtain minimum latencies

Upper limb motor conduction studies

Axillary motor

A: 75 % from acromion to deltoid tuberosity

R: 4 cm distal

G: on the shoulder over trapezius

Stim: Erb's point, straddle C6 transverse process

Point of caution: use maximum stimulus to decrease number of stimulations. Hold the upper limb in adduction. Recording of both sites can be done with single stimulation

Musculocutaneous nerve

A: 60% of distance from acromion to biceps attachment

R: biceps attachment

G: on the shoulder over trapezius

Stim: Erb's point, straddle C6 transverse process

Point of caution: use maximum stimulus to decrease number of stimulations. Hold the upper limb in adduction.

Erb's point: *5 cm above midpoint of clavicle (halfway between sternal notch and acromioclavicular joint) toward mastoid process (at C6 transverse process)*

Radial motor

A: line between ulnar and radial styloid , 2 fb proximal from midline in the extensor surface of the distal forearm

R: extensor area of the wrist over ulnar styloid

G: anterior wrist

Stim D: 8 cm proximal to active electrode in the facial plane between the extensor muscles closer to the ulna

Stim Elbow: Anterior and inferior to lateral epicondyle between brachioradialis and lateral epicondyle

Stim above elbow: 3 fb inferior and just posterior to deltoid tubercle at radial spiral groove

Point of caution: will need a high intensity stimulation to obtain responses

Suprascapular motor

A:

R:

G:

Unar motor

A: muscle belly of abductor digiti minimi in medial hypothenar eminence

R: fifth metacarpal-phalangeal joint

Stim: medial wrist , adjacent to the flexor carpi ulnaris tendon; below elbow 4 cm distal to the medial epicondyle; above elbow over the medial humerus, between biceps and triceps muscles at a distance of 10-12 cm from the below-elbow site; in the proximal axilla, medial to the biceps over the axillary pulse

Median motor

A: muscle belly in the lateral thenar eminence of the abductor pollicis brevis

R: first metacarpophalangeal joint

Stim: middle of the wrist between the tendons of the flexor carpi radialis and palmaris longus; in atecubital fossa over the brachial artery pulse

Normal values Motor Nerves

Nerve	DML ms	CMAP mV	CV m/sec	Distance cm
Axillary	3.9 (0.5)	12.7 (10.8 – 14.8) Peak to peak		
Musculocutaneous	4.5 (0,6)	Compare to normal side		
Suprascapular -supraspinatus -infraspinatus	 2.7 (0,5) 3.3 (0.5)	Compare to normal side		
Radial	2.4 (0.5)	Side to side comparison < 50 %	61.6 (5.9)	8
Median	4.4	>4	>49	7
Ulnar	3.3	>6	>49	7
F-wave Consider age, height and limb length	Minimum latency Median 22-30 Ulnar 22-31		Chronodispersion Median 4 ms Ulnar 4 ms	
Median H reflex (FCR) Consider limb length and height	13 -19 side to side comparison < 1			

Normal values Sensory Nerves

Nerve	CV m/sec	DSL ms	SNAP microV	Distance cm
LABC	<60 = 62 <61 = 59	<30 = 2,2 31-60 = 2,3 >61 = 2,4	<40= 21.1 (7-70) 41-60=18.4 (8-34) 61-70=15,9 (6-30) >71=13.1 (5-28)	14
MABC	<40=64 41-50=63 51-70=61 >71=58	<50=2.2 51-70=2.3 >71=2.4	<40=12.1 (4-32) 41-60=11.4 (3-23) >61=9.7 (3-17) Compare to normal side	14
Radial (first web space)	>40	<2.5	>20	10

C.R. Sridhara MD

Normal values

Moss rehab Electrodiagnostic center