

Motor nerve conduction studies lower limb

Tibial motor study

A: 1 cm proximal and 1 cm inferior to the navicular prominence on the abductor hallucis brevis muscle

R: over the metatarsal-phalangeal joint of the great toe

Stim: medial ankle above and posterior to the medial malleolus, in the popliteal fossa mid-posterior knee over the popliteal pulse

Caution: if initial positive deflection, G1 is not over the motor endplate; position of G1 should be changed slightly. CMAP amplitude at the popliteal fossa stimulation site often is lower than at the medial ankle stimulation site (normal controls may drop up to 50%); side-to-side comparisons often are useful in this situation

Peroneal motor study to M extensor digitorum brevis

A: dorsal lateral foot on the Extensor digitorum brevis

R: distally over the metatarsal-phalangeal joint of the little toe

Stim: anterior ankle, slightly lateral to tibialis anterior tendon; below fibular head on the lateral calf, one to two fingerbreadths inferior to fibular head, in lateral popliteal fossa adjacent to external hamstring tendons at 10-12 cm from the below-fibular head site

Caution: avoid excessive stimulation at the lateral popliteal fossa site to prevent costimulation of the tibial nerve

Peroneal motor study to M tibialis anterior

A: proximal to mid-anterior lateral calf with G1 placed over the muscle belly

R: distally over anterior ankle

Stim: below fibular head on the lateral calf one to two fingerbreadths inferior to fibular head, in lateral popliteal fossa adjacent to external hamstring tendons

Caution: demonstrating a conduction block, focal slowing across the fibular neck, or both may be easier when recording the TA than the EDB

Femoral motor study

A: anterior thigh, halfway between inguinal crease and knee

R: bony prominence at the knee

Stim: middle of inguinal area slightly lateral to femoral pulse, below the inguinal ligament

Caution: used to compare motor amplitudes from side to side to quantitate the degree of axonal loss in femoral neuropathies, lumbar plexopathies and severe L4 radiculopathies; normal amplitude is > 3 mV, however side-to-side comparisons are most useful

Normal adult values:

Nerve	Record	Amplitude mV	Conduction velocity (m/s)	Distal latency (ms)	Distal distance (cm)
Peroneal	EDB	>2	>44	<6.5	9
Peroneal	TA	>5	>44	<6.7	5-10
Tibial	AHB	>4	>41	<5.8	9

Electromyography and neuromuscular disorders Edition 2

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