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Electrodiagnosis of peripheral nerves

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Electro diagnostic (EDX) studies play an essential role in the evaluation and disorders localization of the peripheral nervous system such as disorders of the primary motor neurons (anterior horn cells), primary sensory neurons (dorsal root ganglia), nerve roots, brachial and lumbosacral plexuses, peripheral nerves, neuromuscular junctions, and muscles. These studies include variety of tests such as nerve conduction studies (NCSs), repetitive nerve stimulation, late responses, blink reflexes, and needle electromyography (EMG). It is an extension of the clinical history and examination. Therefore, a directed history and examination prior to the study is important and it helps to formulate a study based on the differential diagnosis. Nerve conduction studies are tests of the peripheral sensory and motor nerves assess pre and post ganglionic lesions, identify lesions of the plexus or the relevant peripheral nerves. EMG helps further to localize the lesion by assessing the presence of active denervation in the muscles supplied by the affected nerve, the presence of re-energating potentials, it also analyzes whether the underlying process is neuropathic or myopathic in origin as well as helps in predicting the prognosis. Patients with suspected neuromuscular junction disorders undergo repetitive nerve stimulation to assess for abnormalities in neuromuscular transmission and identify the presence of pre or post synaptic defect. A specific test for the single muscle fiber (single fiber EMG) assesses the presence of jitter. The use of the various EDX studies summarized.

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