

Evidence Discussion

(PN-1.0) **EviCore**
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- Electromyography (EMG) and nerve conduction velocity (NCV) studies are useful in establishing the origin of peripheral nerve pathology and in guiding further diagnostic evaluation. Needle EMG following traumatic nerve injury may detect denervation of muscles that do not seem clinically affected. The optimal time to search for denervation changes is 10 to 14 days after the injury. Needle EMG may show residual innervation to paralyzed muscles. Follow-up EMG and NCV studies may demonstrate early evidence of re-innervation or evolving abnormalities that objectively demonstrate the temporal course of peripheral nerve pathology.¹
- Deferring EMG due to COVID-19 is less relevant at this time.²
- For superficial peripheral nerves, ultrasound has significantly higher resolution than MRI. In terms of expense, safety, and noninvasiveness, ultrasound has clear advantages over MRI and the few comparative reports available confirm the value of ultrasound as an initial imaging choice.³
- Advantages of ultrasound over MRI for detecting peripheral nerve pathology include lower cost, rapidity of examination, higher spatial resolution, imaging of the nerve in continuity, and ease of side-to-side comparisons. Ultrasound may better detect subtle changes in nerve caliber. This is important because peripheral nerve pathology is often fusiform in shape and can extend along the length of the nerve without greatly altering its cross-section area. MRI frequently misses multifocal (71%) and occasionally single pathologies.
- Advantages of MRI over ultrasound include superior contrast between tissues, imaging of structures that are deep or surrounded by bone, and tissue characterization using multi-sequence analysis and IV contrast.⁴
- There is greater accuracy (96%) of diagnoses in cases of peripheral nerve sheath tumor, traumatic neuroma or neuropathy, idiopathic mono-neuropathy or plexopathy, fibrosis of nerves, nerve compression caused by ganglion or synovial cysts or any other soft tissue structures, non-neural soft tissue tumors, intra-neural granulomas, and vasculitis with ultrasound than MRI.

References

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4. Zaidman CM, Seelig MJ, Baker JC, Mackinnon SE, Pestronk A. Detection of peripheral nerve pathology: comparison of ultrasound and MRI. *Neurology*. 2013;80(18):1634-1640. doi:10.1212/WNL.0b013e3182904f3f
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