

Evidence Discussion for Polyneuropathy (PN 3)

- Polyneuropathies are typically diagnosed by a combination of clinical history, thorough neurological examination, lab work up, and electrodiagnostic testing with electromyography (EMG) and nerve conduction studies (NCS).¹
- For systemic polyneuropathies with potential for central nervous system (CNS) involvement, such as Lyme disease-related polyneuropathy and some inflammatory polyneuropathies, MRI imaging of the brain and/or spinal cord may be helpful identify typical patterns of involvement or to rule out other pathologies when clinical findings suggest CNS involvement.^{2,3}
- Neuropathy is the most common neurological complication of human immunodeficiency virus (HIV) infection and, in its most common form, is treated with symptom management and anti-viral therapy. However, other acquired immunodeficiency syndrome (AIDS)-related neurological disorders may be difficult to clinically differentiate from common HIV polyneuropathy and may require more aggressive treatment. Accurate diagnosis of AIDS-related cytomegalovirus (CMV) polyradiculopathy, HIV vasculitis, or AIDS-related motor neuron disease is required for appropriate treatment; MRI imaging of the spinal cord or nerve roots may assist with diagnosis when clinically indicated.⁴
- Chronic acquired demyelinating polyneuropathies, including chronic inflammatory demyelinating polyneuropathy (CIDP) and multifocal motor neuropathy (MMN), are diagnosed by clinical history and results of electromyography and nerve conduction studies.⁵ If the diagnosis remains uncertain after these studies, neuroimaging may help establish the diagnosis. Evidence of lumbar nerve root involvement on MRI lumbar spine is supportive of a CIDP diagnosis. T2-weighted signal change on MRI of the brachial plexus is often present in MMN patients.^{1,5}
- POEMS (Polyneuropathy, Organomegaly, Endocrinopathy, M-protein, Skin Changes) syndrome is a disorder affecting multiple organ systems which occurs in the setting of a plasma cell disorder. Diagnosis is based on electrodiagnostic confirmation of polyneuropathy and work up of the underlying oncologic condition.³
- Electrodiagnostic testing can provide valuable findings in the investigation of some paraneoplastic polyneuropathies; however, identification of the underlying malignancy and appropriate oncological management are key to management.⁶

1. Stoll G, Wilder-Smith E, Bendszus M. Imaging of the peripheral nervous system. *Handb Clin Neurol*. Published online 2013:137-153. doi: 10.1016/b978-0-444-52902-2.00008-4.
2. Eftimov F, Lucke IM, Querol LA, Rajabally YA, Verhamme C. Diagnostic challenges in chronic inflammatory demyelinating polyradiculoneuropathy. *Brain*. 2020;143(11):3214-3224. doi: 10.1093/brain/awaa265.

3. London ZN. A Structured Approach to the Diagnosis of Peripheral Nervous System Disorders. *Continuum (Minneap Minn)*. 2020;26(5):1130-1160. doi: 10.1212/con.0000000000000922.
4. Harrison TB, Smith B. Neuromuscular Manifestations of HIV/AIDS. *J Clin Neuromuscul Dis*. 2011;13(2):68- 84. doi: 10.1097/cnd.0b013e318221256f.
5. Saperstein D. Chronic Acquired Demyelinating Polyneuropathies. *Semin Neurol*. 2008;28(2):168-184. doi: 10.1055/s-2008-1062268.
6. Binks S, Uy C, Honnorat J, Irani SR. Paraneoplastic neurological syndromes: a practical approach to diagnosis and management. *Pract Neurol*. 2022;22(1):19-31. doi: 10.1136/practneurol-2021-003073.