

Diagnostic Workup for Patients with Suspected Demyelinating Disease: Testing Options

<u>Imaging Studies</u>		
Brain MRI findings are abnormal in 95% of MS patients.		
Brain MRI	Location <ul style="list-style-type: none"> • Plaques typically in the periventricular region, corpus callosum, centrum semiovale, and occasionally in deep white matter structures and basal ganglia • Most common infratentorial plaque locations: surface of the pons, cerebellar peduncles, and white matter regions adjacent to the fourth ventricle 	
	Appearance <ul style="list-style-type: none"> • Ovoid lesions, typically radiating at right angles from the corpus callosum (Dawson's fingers) • Hyperintense on proton density and T2-weighted studies, and hyperintense (or not visible) on T1-weighted images 	
	Acute vs. chronic lesions <ul style="list-style-type: none"> • Acute lesions are gadolinium enhancing owing to the inflammatory response and BBB disruption (a transient effect that disappears after 30-40 days) • Concentric ring-enhancing lesions may be indicative of more extensive tissue damage and more aggressive disease Note: Lesions caused by other conditions – ischemia, SLE, Behcet disease, or other vasculitides – may appear similar, particularly in patients over 50	
	Spinal MRI <ul style="list-style-type: none"> • Little or no spinal cord swelling • Unequivocal hyperintensity on T2-weighted sequences • Size at least 3 mm but < 2 vertebral segments in length • Usually occupy only part of the cord in cross-section • Focal (i.e., clearly delineated and circumscribed on T2-weighted sequences) 	
Blood Tests		
B12 and folate to rule out nutritional deficiencies; ANA, ESR, and RF to rule out other autoimmune disease; Lyme disease, HIV, and HTL-1 titers to rule out some infectious causes, thyroid functions; anticardiolipin antibody testing to rule out other white matter disease, angiotensin converting enzyme to rule out sarcoidosis.		
Cerebrospinal fluid analysis		
CSF oligoclonal banding	85% to 95% abnormal	A qualitative CSF assessment for IgG oligoclonal bands is considered the gold standard analysis. Isoelectric focusing (IEF) combined with IgG immunoblotting is more sensitive than high-resolution agarose gel electrophoresis (60% vs. 30%) with only slightly less sensitivity (94% vs. 96%) (Fortini et al., 2003)
CSF IgG Index	90% abnormal	Index is elevated in most MS patients (nl < 0.7)
Other CSF findings and Differentials		
	Normal	Inflammatory CNS Disease
Cell count/ μ L	<5	Normal or <50
Cells	Lymphocytes/monocytes	Lymphocytes/monocytes
Total protein mg/L	<50	Normal to slightly elevated (protein >100 is not consistent with MS)
Glucose ratio (CSF/plasma)	Typically > 0.5	Normal
Lactate mmol/L	<2.1	Normal
Other	ICP: 6-22 cm H ₂ O	ICP generally within normal limits
Evoked Potentials		
Visual EP	Particularly useful in patients who lack clear clinical evidence of dysfunction above the level of the foramen magnum	
Somatosensory EP	Can be helpful in establishing spinal cord involvement	