



# THE UTILITY OF MRI IN SUSPECTED MS

This is a summary of the American Academy of Neurology's (AAN) guideline evaluating whether MR Imaging (MRI) can predict probable conversion to clinically definite multiple sclerosis (CDMS) in patients presenting with a syndrome consistent with inflammatory demyelination.

Advances in imaging technology suggest the potential for earlier diagnosis and more effective management strategies for MS patients. Until recently, confirmation of the diagnosis of MS has generally required evidence of clinical activity that occurs over a period of time and affects more than one area of the central nervous system. Past methods for diagnosing MS may have missed the opportunity to diagnosis and, therefore, treat MS patients earlier.

For more information read the entire practice guideline at: [www.aan.com/professionals/practice/index.cfm](http://www.aan.com/professionals/practice/index.cfm).

MRI changes seen in MS are nonspecific and, therefore, physicians must always consider the information derived from imaging investigations in the context of the specific clinical situation presented by an individual patient. The following recommendations are based on the exclusion of alternative conditions that can mimic MS or can mimic the radiographic findings seen in MS.

## Evidence for using MRI for early diagnosis of MS

### Strong evidence supports

1. On the basis of consistent Class I, II, and Class III\* evidence, in clinically isolated demyelinating (CIS) patients, the finding of 3 or more white matter lesions on a T2 weighted MRI scan is a very sensitive predictor (>80%) of the subsequent development of CDMS within the next 7-10 years (Level A recommendation\*\*). It is possible that the presence of even a smaller number of white matter lesions (e.g., one to three) may be equally predictive of future MS although this relationship requires better clarification.
2. The appearance of new T2 lesions or new Gd-enhancement three or more months after a clinically isolated demyelinating episode (and after a baseline MRI assessment) is highly predictive of the subsequent development of CDMS in the near term (Level A recommendation).
3. The probability of making a diagnosis other than MS in CIS patients with any of the above MRI abnormalities is quite low, once alternative diagnoses that can mimic MS or the radiographic findings of MS have been excluded. *See table on the back page.* (Level A recommendation).

### Good evidence supports

4. The presence of 2 or more Gd-enhancing lesions at baseline is highly predictive of the future development of CDMS (Level B recommendation).

### Evidence is insufficient to support or refute

5. The MRI features helpful in the diagnosis of PPMS cannot be determined from the existing evidence (Level U Recommendation).

**\*Class of Evidence:** "Class" refers to the quality of research methods employed in the reviewed literature. **Class I:** High quality randomized controlled trials (RCTs); **Class II:** Prospective matched group cohort studies or RCTs lacking adequate randomization concealment or blinding or potentially liable to attrition or outcome ascertainment bias; **Class III:** Other studies such as natural history studies; **Class IV:** Uncontrolled studies, case series or expert opinion.

**\*\*Recommendation Level:** "Level" refers to the strength of the practice recommendation based on the reviewed literature. **Level A:** Established as effective, ineffective or harmful or as useful/predictive or not useful/predictive; **Level B:** Probably effective, ineffective or harmful or as useful/predictive or not useful/predictive; **Level C:** Possibly effective, ineffective or harmful or as useful/predictive or not useful/predictive; **Level U:** Data inadequate or conflicting; treatment, test or predictor unproven.

## DIAGNOSTIC CONSIDERATIONS IN PATIENTS WITH SUSPECTED MS AND/OR MRI WHITE MATTER ABNORMALITIES

- Age-related white matter changes
- Acute disseminated encephalomyelitis
- Behcet's disease
- Bacterial infections (syphilis, Lyme disease)
- Cerebral autosomal dominant arteriopathy, subcortical infarcts, and leukoencephalopathy (CADASIL)
- Cervical spondylosis or stenosis
- HIV infection
- Human T-lymphotrophic virus I / II
- Ischemic optic neuropathy (arteritic and nonarteritic)
- Leukodystrophies (e.g., adrenoleukodystrophy, metachromatic leukodystrophy)
- Neoplasms (e.g., lymphoma, glioma, meningioma)
- Migraine
- Sarcoid
- Sjogren syndrome
- Stroke and ischemic cerebrovascular disease and spinal cord infarction
- Systemic lupus erythematosus, antiphospholipid antibody syndromes, and related collagen vascular disorders
- Unidentified bright objects
- Vascular malformations
- Vasculitis (primary CNS or other)
- Vitamin B12 deficiency

View the following additional AAN MS guidelines at [www.aan.com/professionals/practice/index.cfm](http://www.aan.com/professionals/practice/index.cfm).

Date	Title
June 1999	The Relationship of MS to Physical Trauma and Psychological Stress
May 2000	The Usefulness of Evoked Potentials in Identifying Clinically Silent Lesions in Patients with Suspected MS
June 2000	The Role of Corticosteroids in the management of Acute Monosymptomatic Optic Neuritis
February 2002	Disease Modifying Therapies in Multiple Sclerosis
December 2002	Immunization and Multiple Sclerosis: A Summary of Published Evidence and Recommendations

This is an educational service of the American Academy of Neurology. It is designed to provide members with evidence-based guideline recommendations to assist with decision-making in patient care. It is based on an assessment of current scientific and clinical information, and is not intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and the physician caring for the patient, based on the circumstances involved. Physicians are encouraged to carefully review the full AAN guidelines so they understand all recommendations associated with care of these patients.

Copies of this summary and a companion patient version are available at [www.aan.com/professionals/practice/index.cfm](http://www.aan.com/professionals/practice/index.cfm) or through AAN Member Services at (800) 879-1960.



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