

Recommendations for the coordination of Neurology and Neuroradiology departments in the management of patients with multiple sclerosis

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Eduardo Agüera has participated in advisory boards for Novartis, Sanofi-Genzyme, Roche, y Biogen, and had received speaking honoraria from Bayer, Sanofi-Genzyme, Merck-Serono, Novartis, Roche y Biogen.

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Background and objective

- The worldwide prevalence of **MS** is increasing in the latest decades¹
 - Recent studies show a prevalence in Spain as high as 80-180 cases per 100,000²
- **MRI** is the most important paraclinical tool available to support the diagnosis and monitoring of MS³
- Coordination between **Neurology and Neuroradiology** departments is essential to ensure that radiological studies are effectively performed and interpreted

Objective

To establish a set of organizational recommendations focused on the coordination between neurologists and neuroradiologists to improve MS management in clinical practice

Methods

- A panel of **17 experts** (neurologists and neuroradiologists), from eight Spanish¹ academic hospitals participated in the study
- The **Consensus Recommendation Guideline** was conducted in four phases:

Phase 1

- **Definition of the scope and methodology of the study**

Phase 2

- **Review of the literature on good practices or recommendations in the use of MRI in MS**

Phase 3

- **Discussion of drafted recommendations to achieve a consensus between the authors**

Phase 4

- **Formalization and validation of the contents in a set of recommendations**

Results

Nine recommendations are provided to improve the coordination between Neurology and Neuroradiology departments

Recommendations 1, 2 and 3

- Create shared protocols for MRI studies (1) and standardize the MRI requests (2) and MRI reports (3)

Diagnostic of suspected MS

To communicate the information that the neuroradiologist and the MRI staff will need to be able to correctly prioritize and plan the MRI examination

Monitoring of confirmed MS

To communicate the current clinical situation and clinical signs of disease activity

Results

Key information recommended to be included in the MRI request

Diagnostic MRI	Routine follow-up MRI
<ul style="list-style-type: none"> • Date of clinically isolated syndrome (CIS) • Clinical signs and their evolution over time • Investigation of suspected MS • Treatment with corticosteroids? (start and end date) <ul style="list-style-type: none"> • Parts of the CNS to be examined (justification) <ul style="list-style-type: none"> • Main comorbidities • Assessment of renal function (severe kidney failure) <ul style="list-style-type: none"> • Known allergy to contrast agents • Particular needs, such as pregnancy or breastfeeding, claustrophobia, presence of devices, degree of autonomy <ul style="list-style-type: none"> • Clinical priority 	<ul style="list-style-type: none"> • Clinical situation • Clinical signs and/or disease progression time • Reason for MRI examination: suspected relapse, change in treatment, stable patient control, risk of progressive multifocal leukoencephalopathy • Phenotype <ul style="list-style-type: none"> • Grade of disability • Current treatment (start date)

CNS, central nervous system; MRI, magnetic resonance imaging; MS, multiple sclerosis

Examples of templates for radiological reports of MRI examination

Diagnostic MRI	Follow-up MRI
<ul style="list-style-type: none"> • MRI technique: brain and/or spinal MRI (sequence), with and without gadolinium-based contrast agent administration (dose) • Date of earlier examination used for comparison (if applicable) • Comparative study with previous MRI to indicate the number of new or enlarged T2 lesions • MRI findings: <ul style="list-style-type: none"> – Number of T2 lesions and T2-FLAIR – Lesions presence: <ul style="list-style-type: none"> • Periventricular: Yes/No • Juxtacortical: Yes/No • Brainstem: Yes/No • Cerebellum: Yes/No • Corpus callosum: Yes/No • Spinal cord (if examined): Yes/No – Number, size, and shape of all lesions and topography of gadolinium enhancing lesions – Enhancement in the leptomeningeal compartment (T2-FLAIR) – Detection of focal lesions with severe tissue damage (intracranial hypointensity in T1 SE or T2-FLAIR) – Assessment of brain atrophy: No/Mild/Moderate/Severe – Any incidental or unexpected findings – Dissemination in time: Yes/No – Dissemination in space: Yes/No – Radiological interpretation and differential diagnosis 	<ul style="list-style-type: none"> • MRI technique: brain and/or spinal MRI (sequence), with and without gadolinium-based contrast agent administration (dose) • Comparative study with previous MRI : <ul style="list-style-type: none"> – Date of earlier examination – Indicate if comparison is technically possible – Number of T2 lesions – Number and topography of new or enlarged T2 lesions – Number and topography of gadolinium enhancing lesions – Enhancement in the leptomeningeal compartment (T2-FLAIR) – Detection of focal lesions with severe tissue damage (intracranial hypointensity in T1 SE or T2-FLAIR). Progression in number and size – Assessment of brain atrophy progression – Any incidental or unexpected findings

Results

Recommendation 4

- Standardized quantification of the number of demyelinating lesions

Recommendation 5

- Standardization of MRI schedule
 - Estimated time adjusted according to the type of test and patient
 - Reduce unscheduled scans
 - Prioritize based on urgency
 - Appointment reminders

Number of lesions (range)

Brain MRI	Spinal cord MRI
0-20 (specify exact number)	< 10 (specify exact number)
20-50	> 10
50-100	Diffuse pattern
> 100	
Countless / confluent	

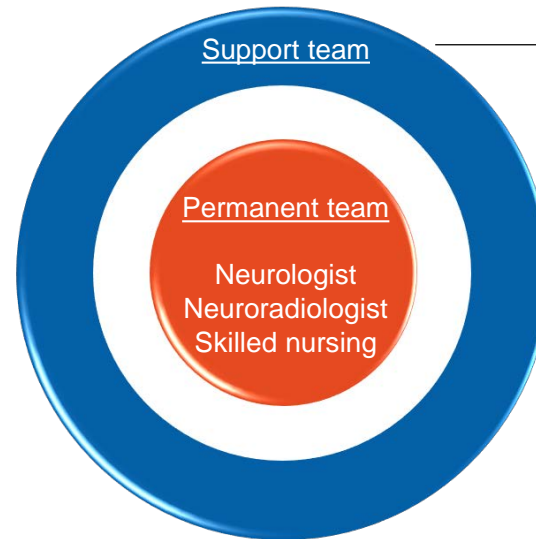
Number of lesions (range)

Type	Recommended acquisition times
Brain MRI diagnosis	40 min
Brain MRI follow-up	30 min
Brain + partial spinal cord MRI diagnosis	40 min + 15 min
Brain + partial spinal cord MRI follow-up	30 min + 15 min
Brain + complete spinal cord MRI diagnosis	40 min + 20 min
Brain + complete spinal cord MRI follow-up	30 min + 20 min

Results

Recommendations 6 and 7

- Identification of reference neuroradiologists for MS (6) and establish multidisciplinary working committees (7)



- Specialists included on the Support team:
 - Neurorehabilitation specialist
 - Speech therapist
 - Neurophysiologist
 - Urologist
 - Neuro-ophthalmologist
 - Psychologist
 - Psychiatrist
 - Pharmacologist

Functions overview of the Multidisciplinary Committee

Previous identification of complex cases

Diagnosis discussion

Therapeutic management discussion

Risk minimisation plan

Patient involvement and shared decision-making discussion

Recommendations 8 and 9

- Establish coordination sessions between Neurology and Neuroradiology departments (8) and generate formal communication channels to improve the coordination between professionals from both departments (9)

Recommendations for coordination sessions between departments

Sessions should be held at least twice every year

Previous reflection of the topics to be discussed in the sessions

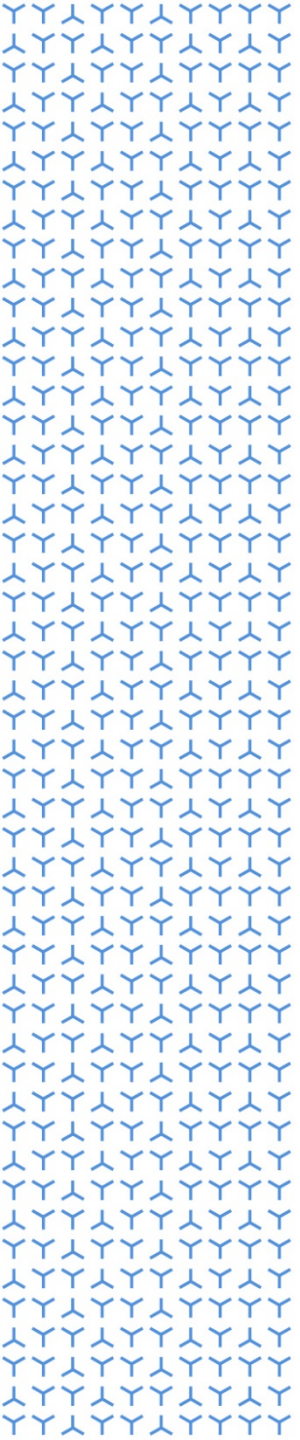
Document sessions with signed minutes

Channel management to establish direct communication of those decisions that involve significant changes to the directors of the centre

Professionals involved in the sessions: neuroradiologists, neurologists and neurological nursing graduates. Radiology technicians and other specialists may also be included depending on the topics covered in the sessions

Conclusions

- **Despite the routine use of MRI in the care of patients with suspected or confirmed MS, there is a lack of scientific evidence defining its optimal use¹**
- **We propose a series of recommendations expected to serve as a functional guide to implement improvements in the coordination between neurologists and neuroradiologists that will ultimately lead to improve the diagnosis and follow-up of MS patients**



Thank you