

Diagnosis & Types of MS

20. How is MS diagnosed?

There is no single test that can diagnose MS. It is a clinical diagnosis, meaning the diagnosis has to be based on the patient's history of symptoms, neurological examination, and investigations including MRI scans.

21. What are the different types of MS?

There are two broad classes of MS:

- Relapsing-remitting multiple sclerosis (RRMS) is the most common type of MS (80-85%). This form of MS is characterized by relapses or attacks (*SEE BELOW SECTION ON MS ATTACKS*) with periods of stability in between (or remission). This type of MS usually starts in the late twenties or early thirties and is almost three times more common in women than men. Later in the disease course, RRMS patients may stop having frequent attacks but slowly start progressing. This stage of MS is referred to as Secondary Progressive MS (SPMS). Patients with SPMS can have relapses but usually have a progressive course.
- Primary-progressive MS is the less common form of MS (10-15%). In this type of MS, patients do not experience relapses and progress steadily from the very beginning. This type of MS tends to occur more commonly in some what older people, usually in their forties or fifties. Unlike RRMS, men and women with PPMS tend to be affected equally.

Rarely, patients who have had PPMS for several years may have an attack that can confuse both the patient and the neurologist regarding the type of MS. This is probably the most rare type of MS in which patients with PPMS may experience a rare attack. Such patients are referred to as Progressive Relapsing MS.

22. What tests are used to diagnose MS?

The MRI of the brain and spinal cord are the most important tests because more than 90% of the patients who have MS also have changes on the MRI scan consistent with MS. Other useful tests to consider are the lumbar puncture (spinal tap) and evoked potentials (see below). Blood tests and in some cases a chest CT scan are needed to rule out other diseases which can mimic MS, like lupus and sarcoidosis.

23. What if the brain and spinal MRI are normal?

If both the brain and spinal cord MRIs are normal, the diagnosis of MS, although still possible, is very unlikely. In this instance, a lumbar puncture may be recommended.

Furthermore, it may be necessary to examine the patient at frequent intervals and repeat MRI scans as needed.

24. Is a lumbar puncture (also called a spinal tap) necessary to diagnose MS?

No, a lumbar puncture (LP) is not necessary to confirm the diagnosis of MS. The LP is a relatively simple procedure that can be done in the doctor's office in about 30 minutes. It involves giving local anesthesia in the lower back before inserting a small needle into the lower back to obtain a small amount of fluid. This fluid, called cerebrospinal fluid or CSF, bathes the spinal cord and the nerves coming out of it. Almost 80 to 90% of MS patients have immune system abnormalities in the spinal fluid. These abnormalities can be seen in other disease as well and therefore, the doctor has to keep in mind the clinical "picture" when interpreting the result of the spinal fluid.

25. Evoked potentials (EP) and MS

Evoked Potentials are tests that measure the brain's response to certain types of stimulation. They are less sensitive tests than MRI and LP in diagnosing MS but may still be helpful in certain situations. Three kinds of EPs are used by neurologists:

- Visual evoked potentials (VEP) look for abnormalities in the visual system, particularly the optic nerves.
- Brainstem auditory evoked potentials (BAEP) look for hearing abnormalities in the inner ear and the hearing centers in the brain.
- Somatosensory evoked potentials (SSEP) look for abnormalities in the transmission of sensation from an arm or leg through the spinal cord to the brain.

26. Which diseases can mimic MS?

The list of diseases with clinical symptoms or MRI results that can mimic MS includes, but is not limited to:

- Lupus
- Sarcoidosis
- Sjogren's syndrome
- Vitamin B12 deficiency
- Lyme's disease
- Stroke
- HTLV-1 myelopathy
- Vasculitis

- Genetic mutations that can stroke (CADASIL)
- Genetic mutations that can cause abnormalities of myelin (also known as leukodystrophy)
- Leber's hereditary optic neuropathy (a genetic mutation that can lead to progressive loss of vision and blindness along with occasional MRI abnormalities)
- Mitochondrial diseases. This is a group of diseases which are as a result of genetic abnormalities that can cause symptoms and MRI scans mimicking MS

Each of these should be carefully evaluated depending on the patient's history and neurological examination. Not every single disease mimicking MS needs to be ruled out in every case.

27. What is the appropriate strategy for a patient suspected of having MS but with a normal examination and investigations?

Sometimes MS can take several years to be confirmed. In this situation, the patient should be followed periodically by a neurologist. Based on the patient's history and neurological examination, it may be helpful to repeat brain and spinal cord MRI scans as needed. However, symptoms alone should never be used to confirm the diagnosis of MS. Objective evidence is required to support the diagnosis of MS.