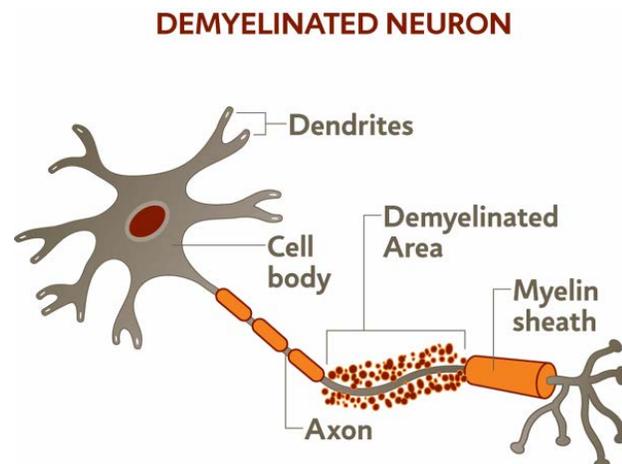




What is Multiple Sclerosis?

- Multiple sclerosis is a chronic, often disabling disease that attacks the central nervous system (brain and spinal cord).
- Symptoms may be mild, such as numbness in the limbs, or severe, such as paralysis or loss of vision.
- MS is thought to be an immune-mediated disease in which the body's immune system attacks myelin, the fatty substance that surrounds and protects the nerve fibers of the central nervous system.
- The progress, severity, and specific symptoms of MS vary among individuals and are unpredictable.
- Most individuals with MS have near-normal life expectancies, and most learn to cope with the disease and are able to live productive lives.
- The damaged myelin forms scar tissue (sclerosis). Often the nerve fiber is also damaged. When any part of the myelin sheath or nerve fiber is damaged or destroyed, nerve impulses traveling to and from the brain and spinal cord are distorted or interrupted. This can be compared to a loss of insulating material around an electrical wire, which interferes with the transmission of signals.
- Today, new treatments and advances in research are giving new hope to people who are affected by the disease.



Who Gets MS?

- Most people with MS are diagnosed between the ages of 20 and 50.
- There are an estimated 8-10,000 children under the age of 18 who also live with MS.
- About two thirds of people diagnosed with MS are women.
- The disease is more frequently found among people raised in colder climates.
- Studies indicate that genetic factors make certain individuals susceptible to the disease, but there is no evidence that MS is directly inherited.
- It occurs more commonly among Caucasians, especially those of northern European ancestry, but people of African, Asian and Hispanic backgrounds are not immune.
- More than 2.3 million people are affected by MS worldwide.

Types of MS

Relapsing-Remitting

Characteristics: People with this type of MS experience clearly defined flare-ups (relapses) or episodes of acute worsening of neurologic function. These are followed by partial or complete recovery periods (remissions) between attacks that are free of disease progression.

Frequency: The most common form of MS at time of initial diagnosis. Approximately 85% at onset.

Secondary-Progressive

Characteristics: People with this type of MS experience an initial period of relapsing-remitting MS, followed by a steady worsening disease course with or without occasional flare-ups, minor remissions (recoveries) or plateaus.

Frequency: Prior to the availability of the approved disease modifying therapies, studies indicated that 50% of those diagnosed with relapsing-remitting MS would transition to this form of MS within 10 years, and 90 percent would transition within 25 years. While MS Experts agree that the medications have an impact on disease progression, it is too soon to tell the extent to which the disease-modifying treatments alter or delay the transition to secondary-progressive MS.

Primary-Progressive

Characteristics: People with this type of MS experience a nearly continuous worsening of their disease from the onset, with no distinct relapses or remissions. However, there are variations in rate of progression over time, occasional plateaus, and temporary minor improvements.

Frequency: Relatively rare. Approximately 10% at onset.

Progressive-Relapsing

Characteristics: People with this type of MS experience a steadily worsening disease from the onset, but also have clear acute flare-ups (relapses), with or without recovery. In contrast to relapsing-remitting MS, the periods between relapses are characterized by continuous disease progression.

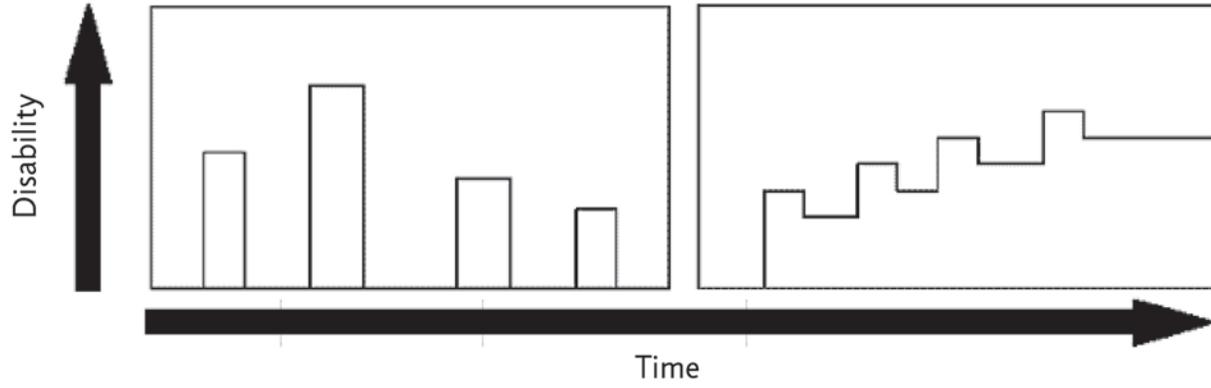
Frequency: Relatively rare. Approximately 5% at onset.

Assessment of Progression

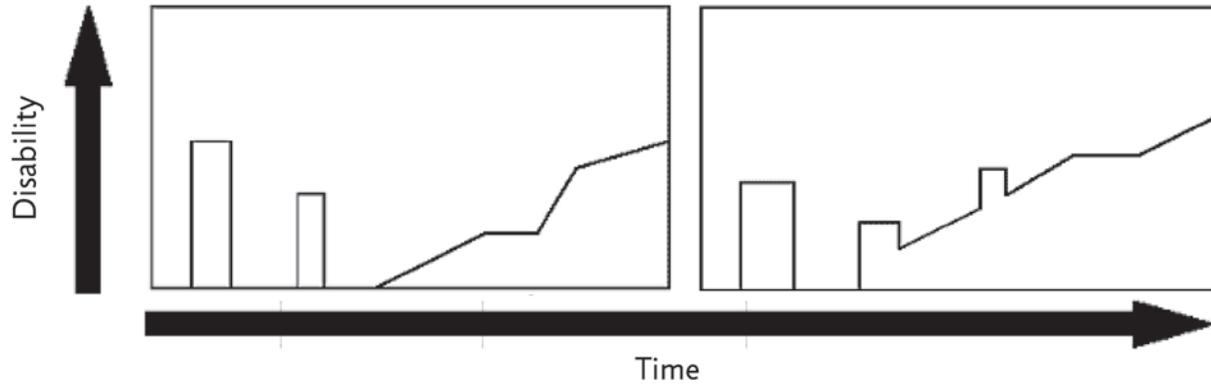
Physicians evaluate disease progression in four ways:

1. **Radiographically:** by looking for new lesions, gadolinium-enhanced lesions, or an increased amount of disease on MRI
2. **Electrophysiologically:** by measuring changes in the sensory evoked potentials
3. **Neurologically:** by measuring changes in function on the neurologic examination
4. **Functionally:** by assessing the person's physical and cognitive abilities

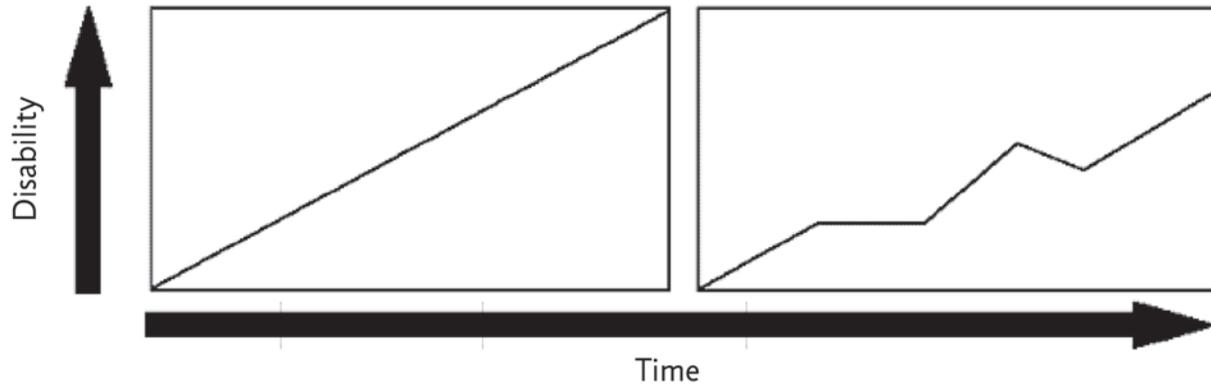
Relapsing-Remitting MS



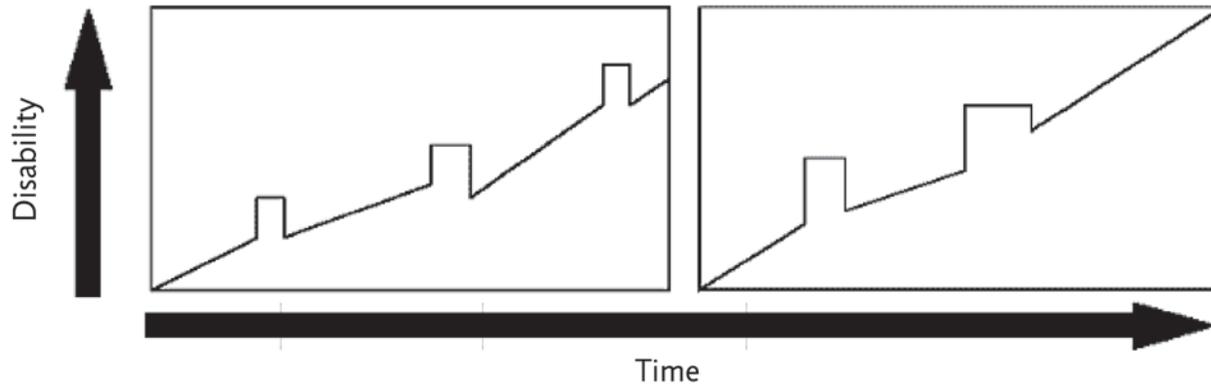
Secondary-Progressive MS



Primary-Progressive MS



Relapsing-Progressive MS



Symptoms of MS

Symptoms of MS are unpredictable and can vary from person to person, and from time to time in the same person. They may come and go, appear in any combination, and be mild, moderate or severe. Some of the most common symptoms of MS include:

- Fatigue
- Numbness
- Walking, balance and coordination problems
- Bladder and bowel dysfunction
- Vision problems
- Dizziness and vertigo
- Sexual dysfunction
- Pain
- Cognitive dysfunction
- Emotional changes
- Depression
- Spasticity

Diagnosis

At this time, there are no symptoms, physical findings or laboratory tests that can, by themselves, determine if a person has MS. The doctor uses several strategies to determine if a person meets the MS diagnostic criteria. In order to make a diagnosis of MS, the physician must:

- a) Find evidence of damage in at least **two** separate areas of the central nervous system,
- AND -
- b) Find evidence that the damage occurred at two different points in time
- AND -
- c) Rule out all other possible diagnoses.

Treatment

Although there is still no cure for MS, effective strategies are available to modify the disease course, treat exacerbations, manage symptoms, and improve function and safety. Current FDA-approved disease modifying therapies include:

- Aubagio (aubagio.com | Genzyme)
- Avonex (avonex.com | Biogen Idec)
- Betaseron (betaseron.com | Bayer Healthcare)
- Copaxone (copaxone.com | Teva)
- Extavia (extavia.com | Novartis)
- Gilenya (gilenya.com | Novartis)
- Lemtrada (lemtrada.com | Genzyme)
- Novantrone (EMD Serono)
- Plegridy (plegridy.com | Biogen Idec)
- Rebif (rebif.com | EMD Serono / Pfizer)
- Tecfidera (tecfidera.com | Biogen Idec)
- Tysabri (tysabri.com | Biogen Idec)