**Multiple Sclerosis (MS)**

Multiple Sclerosis is an unpredictable, chronic disease of the central nervous system. It affects between 350,000 and 500,000 people in the United States and is one of the main causes of adult disability. It is more prevalent in certain regions of the world. It is an autoimmune disease, meaning it causes a person's own immune system to mount a destructive response against his or her own body. In MS, this immune response is against the myelin fibers, a fatty substance that insulates the nerves and helps transmit nerve impulses between the brain and other parts of the body. Plaque forms when the myelin sheath is destroyed, a process called demyelination. Without the myelin, signals are disrupted or halted. The symptoms and the course of the disease vary widely, partly due to the location of scar tissue and to the extent of demyelination.

There is no known cause of MS. The course of the disease varies with each person, leaving much uncertainty and unpredictability as to what is to come. The role of trauma in causing MS or in triggering attacks is controversial. Traumatic events are most likely caused by MS symptoms, rather than being a precipitating factor. Many different viruses have been suggested as a cause of MS but there is no definitive evidence linking any one virus to the disease. Multiple Sclerosis is not directly inherited, nor is it contagious or fatal. Epidemiology surveys show that the risk increases if a close family member has MS, but is still relatively low. The average life expectancy after onset is about 50 years.

**TYPES OF MULTIPLE SCLEROSIS:**

**Relapsing-Remitting:** acute attacks called *exacerbations*, followed by full or partial remission of symptoms **Primary Progressive:** gradual but steady progression of disability, without any obvious relapses or remissions **Secondary Progressive:** initially begins with relapsing-remitting course but evolves into progression at a variable rate **Progressive Relapsing:** characterized by a steady progression in disability with acute attacks that may or may not be followed by some recovery

**Symptoms**

Diagnosis usually occurs (90%) between the ages of 16 and 60 years. Rarely is MS diagnosed in childhood or after age 60. Depending on the area of the brain where the myelin is attacked, patients may start with one or two symptoms. As the disease progresses, the number of symptoms can increase. They can develop or worsen over several hours, days, or even weeks. The most common early symptoms include tingling sensations, numbness, loss of balance and blurred or double vision. Less common symptoms are slurred speech, sudden onset of paralysis, and lack of coordination. As the disease progresses symptoms may include heat sensitivity, fatigue, a change in thinking or perception and sexual disturbances. Patients do not generally have all of these symptoms.

**Primary Symptoms** are a direct result of demyelination and include weakness, tremors, numbness, loss of balance, vision impairment, paralysis, and bladder or bowel dysfunction. These symptoms can be helped by medications and rehabilitation.

**Secondary Symptoms** are the result of primary symptoms. These might include urinary tract infections due to bladder dysfunction or muscle weakness from disuse due to inactivity due to MS. These symptoms can be treated but it is best to avoid them by treating the primary symptoms.

**Tertiary Symptoms** are social, psychological and vocational complications associated with the primary and secondary symptoms. Depression is a good example of a tertiary symptom and is a common problem in MS patients.

Fatigue is the most common complaint of MS patients. Almost 78% of patients complain of extreme fatigue in the late afternoon that improves by early evening. Modifying one's activities, occupational therapy and medication can be helpful in the case of extreme fatigue.

There is no single tool for a positive diagnosis of MS. As many as ten percent of diagnosed patients actually have another condition that mimics MS. Listed below are some tools that are commonly used during the diagnostic process.

* **MRI** (please link) magnetic resonance imaging) can show evidence of scar tissue in the deep parts of the brain or spinal cord that characterize MS.
* **Spinal Tap (Lumbar Puncture)** is sometimes used to examine cerebrospinal fluid but is not always considered necessary.
* **Evoked Potentials** (please link) (electrical tests of the nerve pathologies), can confirm whether MS has affected the visual, auditory or sensory pathways.
* **Blood Tests** may be used to rule out other conditions but MS cannot be detected in the blood.

Other diagnostic procedures include objective evidence of central nervous system disease from a neurological exam, two or more episodes of symptoms, lasting at least 24 hours and occurring one month apart, or a progressive course of signs and symptoms lasting over six months. Eliminating other possible causes for the symptoms also helps in the diagnosis of Multiple Sclerosis. The expertise of the physician in taking the medical history of a patient is of vital importance in an accurate diagnosis.

**Treatment**

Early treatment is necessary to delay disability, by decreasing injuries to the nervous system caused by the disease. There are two categories of treatment. One is symptom management and the other is treatment that actually changes the course of the disease by modifying the number and severity of attacks and the progression of the disability. Significant progress has been made in both over the last decade. Since 1993, there have been six new drugs that can impact the underlying disease in common forms of MS, though none can completely stop or reverse it. Avonex™, Betaseron™ Rebif™, (interferon drugs) Copaxone™, and Tecfidera are used to prevent the frequency of exacerbations and the size and number of brain lesions. These medications are taken on a regular, preventive basis. Other medications available or under investigation for use in addition to these "disease modulating medications" include steroids, Novantrone™, Imuran™, Methotrexate, and Cytoxan™. A patient and physician generally work together to determine which is the best medical treatment for each individual to use.

Additional medications can be prescribed to help alleviate specific symptoms. Other types of treatment include:

* **Numbness and tingling:** exercise, healthy diet, acupuncture
* **Tremors:** physical therapy, exercise, adaptive equipment, medications
* **Balance:** physical therapy, exercise, adaptive equipment, medications
* **Vision Loss:** eye patch, medication

CAM is short for complimentary and alternative methods. Complimentary is in addition to conventional treatments and alternative is instead of conventional methods of treatment. Approximately 90% of MS patients who use CAM also use conventional methods. As in all forms of treatment for MS, communication with one's physician is essential when using CAM. Some components of CAM include:

* **Health and well-being:** diet, exercise, herbs, vitamins, and hyperbaric oxygen
* **Stress:** massage, reflexology, meditation, tai chi, yoga
* **Symptom management:** acupuncture, homeopathy

Most people live happy, productive, successful lives with MS, learning to take charge in dealing with their body, their doctor, their therapy and their family and friends.