

MULTIPLE SCLEROSIS

Patient Information Fact Sheet

›What is multiple sclerosis?

Multiple sclerosis (MS) is a disease of the nervous system in which the protective myelin sheath that surrounds the nerves in the brain and spinal cord is broken down. This breakdown causes scarring and prevents impulses being sent along the affected nerves. Currently, there is no cure for MS and management of the disease centers around relieving the symptoms. MS is the most common disease of the nervous system (neurological disease) affecting young adults. The average age at which people are diagnosed is between 20 and 40 years. Women are twice as likely as men to be affected by the disease. MS may progress continually over time but in many cases it follows a pattern of alternating periods of relapse (symptom flare-up) and remission (recovery)—called relapsing-remitting MS. MS does not usually reduce life expectancy except in the most severe cases and it is not hereditary or infectious.

›What causes MS?

It is thought that there are probably many factors involved in MS and although a cause has not yet been identified, an abnormal immune response is suspected. The body's own immune system mistakes the myelin sheath surrounding the nerves for a foreign body and attacks it. It is generally believed that there is a genetic susceptibility to MS but as yet the gene responsible has not been identified. Some experts believe that symptoms of MS may be triggered by exposure to a viral infection. No particular virus has been identified, although it has been suggested that a common childhood virus (eg, measles or chickenpox) may act as a trigger. The incidence of MS is higher in temperate countries such as Europe and North America but there are no proven theories yet as to why this may be.

›What are the symptoms of MS?

The symptoms of MS can vary greatly depending on the site of the myelin sheath damage. Areas of nerve damage are referred to as plaques. It is not possible to accurately predict the course of MS in any one person, but in many cases the first five years of a person's illness will indicate whether the disease will be continuous or relapsing-remitting. The disease may present initially as visual problems, pain at the back of the eye (optic neuritis) or face pain. People may find it difficult to concentrate, become forgetful or experience anxiety, depression or mood swings. Symptoms may also include: fatigue; weakness or difficulty walking; numbness or tingling; giddiness or balance problems; speech problems; or problems with bladder or bowel control leading to incontinence. Sexual function or sensation can also be affected. The symptoms of MS may be made worse by factors such as heat and humidity, exercise, fever or overexertion. In most people with MS, symptoms will come and go. Periods of remission may last any length of time, sometimes many years. The reason why remission occurs is not yet understood.

There are four main types of MS: benign, relapsing-remitting, secondary progressive and primary progressive. Most people with MS will suffer from the relapsing-remitting form of the disease to begin with. As the name suggests, this type of MS is characterized by periods of remission and relapse. The relapses are unpredictable and may affect people in different ways each time. The severity of relapses can vary greatly, as can the duration. A relapse can last from hours to months. In the early stages of MS, people are generally symptom-free in periods of remission. Some people with MS have a benign form of the disease. People with this type seem to undergo a complete recovery after a few

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mild attacks with no resulting permanent disability or illness. Very occasionally, some disability may develop at a later date. Secondary progressive MS is a phase of the disease that develops after relapsing-remitting MS. People with this form of the disease do not recover completely from any disability evident during a relapse and their condition worsens progressively. Some people with MS suffer from increasingly severe symptoms and progressive disability from the outset, never having distinct periods of relapse or remission. This type is known as primary progressive MS.

›What tests confirm a diagnosis of MS?

MS is difficult to diagnose because the symptoms may be very vague and there are no specific conclusive tests. A diagnosis of MS is not usually made until a person has experienced two separate bouts of symptoms involving different areas of the central nervous system. Each of these bouts should have lasted for at least 24 hours and the two should have occurred more than a month apart. The doctor will need to perform various tests to confirm the diagnosis. The doctor will usually perform a neurological examination to assess coordination of limbs, balance and reflexes, and to look for any signs of weakness or changes in speech or eye movements. Any changes or problems may indicate abnormalities in the nerve pathways involved in movement or sensation.

Evoked potential tests may also be performed. These tests involve the use of small electrodes, which are attached to the head in order to monitor brain activity in response to sights or sounds. If there is nerve damage these responses may be delayed. A magnetic resonance imaging (MRI) scan can take detailed pictures of the brain and spinal cord and will usually show any plaques that are present. An MRI scan confirms the diagnosis in over 90% of cases. A lumbar puncture may also be performed. Lumbar punctures are usually done under local anesthetic and involve the insertion of a needle into the lower back to take fluid from the spinal cord. Characteristic abnormalities in protein patterns may be detected in the fluid if MS is present. Alternatively, a computer axial tomography (CAT) scan may be performed—this is similar to an MRI scan and is used to show a cross-section of the brain.

›How is MS treated?

There are many health professionals who can help to manage the symptoms of MS, including specialist nurses, physical therapists, occupational therapists, dietitians, continence advisors, and social workers. In addition, there are various medical treatments that may be prescribed at different times. Corticosteroids are often used and may help to shorten the duration of a relapse, although they probably do not affect eventual long-term disability. Treatment with oral corticosteroids (eg, **prednisolone**) is usually tapered off over two to three weeks; intravenous corticosteroids (eg, **methylprednisolone** [Solu-Medrol]) are often used for three to five days.

Adrenocorticotrophic hormone (ACTH) can also be given by intramuscular injection for short periods. Long-term use of corticosteroids is not justified because of the numerous complications that can occur. A class of drugs called immunomodulators is available for the treatment of MS. **Interferon beta-1a** (eg, Avonex, Rebif) and **interferon beta-1b** (eg, Betaseron, Extavia) are given by injection into a muscle (intramuscular) or under the skin (subcutaneous). These drugs may reduce the frequency and severity of relapses in people with relapsing-remitting MS but it is not known

whether they have any effect on long-term progression of the disease. **Glatiramer acetate** (Copaxone) is another type of immunomodulator that may be suitable for some patients with relapsing-remitting MS. Copaxone is given by subcutaneous injection. There are also oral formulations available for relapsing forms of multiple sclerosis such as **fingolimod** (Gilenya), **teriflunomide** (Aubagio), and **dimethyl fumarate** (Tecfidera).

Natalizumab (Tysabri) is a selective immunosuppressive agent that may be used in some people with relapsing-remitting MS. It is given by intravenous infusion every 4 weeks. This drug carries a warning on the label regarding an increased risk of a rare but serious condition called progressive multifocal leukoencephalopathy, so your neurologist would decide with you if the benefits of taking this drug outweigh the risks.

Muscle relaxants may help to reduce muscle spasticity. These include **baclofen** (Gablofen), **diazepam** (Valium), **dantrolene** (Dantrium), and **tizanidine** (Zanaflex). Pain caused by nerve damage may occur in people with MS—most painkillers have no effect on this type of pain. Using a TENS (transcutaneous electromagnetic nerve stimulation) machine may block the sensation of pain in some people, but in others the symptoms may become worse after use. If sharp, cramping pains occur at night, **carbamazepine** (Tegretol) may be given. Other techniques for severe pain relief may be used, such as acupuncture, anesthetic nerve blocks and surgical procedures.

➤ **Further information**

National Institute of Neurological Disorders and Stroke:

www.ninds.nih.gov/disorders/multiple_sclerosis/multiple_sclerosis.htm

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