CONDITION

MS (multiple sclerosis)

Multiple sclerosis is a long-term condition in which the immune system damages nerves in the brain and spinal cord.

WHAT IT IS
Immune-mediated damage to brain and spinal cord nerve covering

BODY SYSTEM
Brain and spinal cord

MAIN SYMPTOMS
Vision changes, numbness, weakness, balance problems

WHAT CAUSES IT
Immune attack; exact trigger unknown

HOW IT IS DIAGNOSED
Neurological examination, MRI, and sometimes spinal fluid tests

MAIN TREATMENT
Disease-modifying therapies, rehabilitation, and symptom management

CAN IT BE CURED?
No - treatments can reduce condition activity

IS IT AN EMERGENCY?
Sometimes, with sudden one-sided weakness or breathing difficulty

LONG-TERM OUTLOOK
Often manageable, though disability may increase over time

Overview

Multiple sclerosis, usually called MS, is a long-term condition affecting the brain and spinal cord. Together, these make up the central nervous system.

In MS, the immune system mistakenly attacks myelin, the protective coating around nerve fibres. The damage can also affect the nerve fibres themselves. Areas of damage form scars, or "sclerosis," which can interrupt messages travelling between the brain and the rest of the body.

The effects depend on where this damage occurs. MS can affect sight, movement, sensation, balance, bladder control, thinking, mood, and energy levels. Symptoms differ greatly between people.

MS often follows one of several patterns. In relapsing-remitting MS, new symptoms appear or existing symptoms become worse during a relapse, followed by partial or complete recovery. Some people later develop secondary progressive MS, with a more gradual increase in disability. Primary progressive MS causes gradual worsening from the beginning, usually without clear relapses.

MS is not contagious. It is also different from muscular dystrophy, motor neurone disease, and dementia, although some symptoms may overlap.

Symptoms

MS symptoms may develop over hours or days. They can last for days, weeks, or longer. Some improve completely, while others leave lasting changes.

Common symptoms include:

A relapse means new or clearly worsening neurological symptoms lasting at least 24 hours, without another explanation such as fever or infection. Symptoms from earlier nerve damage can temporarily become worse during hot weather, exercise, stress, or illness. This is sometimes called a pseudo-relapse and does not necessarily mean that new damage has occurred.

Many of these symptoms have causes other than MS. A medical assessment is needed to find the reason.

- Blurred or reduced vision, often in one eye, sometimes with eye pain
- Numbness, tingling, burning, or unusual skin sensations
- Weakness, stiffness, or muscle spasms
- Problems with balance, coordination, or walking
- Severe tiredness that is not explained by activity or poor sleep
- Bladder urgency, leakage, difficulty emptying the bladder, or constipation
- Dizziness, tremor, or slurred speech
- Nerve pain or painful muscle spasms
- Problems with attention, memory, or processing information
- Depression, anxiety, or emotional changes
- Sexual difficulties

Causes and risk factors

The exact cause of MS is not known. It appears to result from a combination of immune, genetic, and environmental factors.

MS is considered an immune-mediated condition. This means the immune system drives the damage, although the reason it begins attacking myelin is unclear.

Genes can affect susceptibility, but MS is not usually passed down in a simple inherited pattern. Having a close relative with MS raises the chance of developing it, but most relatives do not develop the condition.

Other factors associated with a higher chance of MS include previous infection with Epstein-Barr virus, which commonly causes glandular fever, smoking, low vitamin D levels, and living farther from the equator during childhood. These associations do not show that any one factor directly caused a particular person's MS.

MS is more often diagnosed in women than men. It commonly begins in early or middle adulthood, but it can occur at other ages.

Diagnosis

There is no single symptom or blood test that confirms MS. Diagnosis is usually made by a neurologist, a specialist in conditions affecting the nervous system.

The assessment includes a history of your symptoms and a neurological examination. This checks functions such as vision, strength, sensation, reflexes, coordination, and walking.

An MRI scan is a central part of diagnosis. MRI uses a strong magnetic field to create detailed images of the brain and spinal cord. It can show areas of inflammation or scarring called lesions.

The diagnosis generally requires evidence that damage has occurred in different parts of the central nervous system and at different times. In some circumstances, the features of one episode and the MRI findings provide enough evidence.

A lumbar puncture may be used when the diagnosis is uncertain. A needle collects a small amount of the fluid surrounding the brain and spinal cord. The laboratory looks for immune proteins called oligoclonal bands, which can support a diagnosis but are not unique to MS.

Blood tests help rule out conditions that can resemble MS, such as vitamin deficiencies, infections, and other immune conditions. Tests of the eye or electrical nerve responses may sometimes provide further information.

Getting a diagnosis can take time because symptoms and MRI changes may have other explanations. A careful assessment helps reduce the risk of an incorrect diagnosis.

Treatment and management

There is currently no cure for MS, but treatment can reduce relapses, limit new MRI damage, manage symptoms, and help you remain active and independent.

Disease-modifying therapies, often shortened to DMTs, change how the immune system behaves. Depending on the treatment, they may be taken as tablets, injections, or infusions. They do not repair all existing nerve damage, but many reduce new inflammatory activity. Some can also slow disability progression in particular forms of MS.

The choice of DMT takes account of the type and activity of MS, other health conditions, pregnancy plans, likely side effects, and the monitoring required. Blood tests, MRI scans, or infection screening may be needed before and during treatment.

A relapse that seriously affects daily function may be treated with corticosteroids like prednisone or hydrocortisone . These medicines can shorten recovery time but do not usually change long-term recovery or prevent future relapses. Severe relapses that do not improve with steroids may sometimes be treated with plasma exchange, which filters certain immune proteins from the blood.

Symptom treatment is tailored to the problem. It may include medicines for pain, stiffness, bladder symptoms, or mood, as well as:

Regular activity can support fitness, mobility, mood, and general health. Exercise does not make MS progress faster, although heat or exertion may temporarily bring out old symptoms. Activities can be adapted around fatigue, balance, and temperature sensitivity.

- Physiotherapy to support strength, movement, balance, and flexibility
- Occupational therapy to make daily activities safer or easier
- Speech and language therapy for speech or swallowing problems
- Psychological support for mood, adjustment, or cognitive changes
- Mobility aids, workplace changes, or energy-conservation strategies

Complications

MS can cause lasting disability, but the degree and type are not predictable from one person to

another.

Possible complications include falls, reduced mobility, persistent pain, muscle shortening, and skin problems caused by limited movement. Bladder-emptying difficulties can contribute to urinary infections or kidney problems if they are not managed.

Swallowing problems may lead to poor nutrition or food entering the airway. Reduced movement, swallowing problems, and some treatments can increase the risk of infection.

Fatigue, cognitive changes, depression, and anxiety can affect work, relationships, and independence even when physical disability is limited. These symptoms deserve attention because treatment and practical support may help.

Some disease-modifying therapies reduce parts of the immune response. Their risks differ, but may include infections, changes in blood cell counts, liver problems, or rare serious complications. Monitoring is intended to identify problems early.

Prevention

There is no proven way to prevent MS. It is not caused by something you did, and people with a family history cannot reliably prevent it through testing, diet, or supplements.

Not smoking may lower the risk of developing MS and is associated with a better course after diagnosis. It also protects heart, lung, and bone health. However, avoiding smoking cannot guarantee that MS will not occur.

No particular diet has been shown to prevent or cure MS. A balanced diet and suitable physical activity support general health but do not replace MS treatment.

Vitamin D is being studied in relation to MS. Taking high-dose supplements without medical advice can be harmful, and supplementation has not been proven to prevent the condition.

Living with it and what to expect

MS often changes over months and years rather than from day to day. In relapsing MS, symptoms may come and go. Recovery from a relapse can continue for weeks or months, but it may be incomplete.

Some people have little disability for many years. Others develop mobility, vision, cognitive, or bladder difficulties that increasingly affect daily life. Progressive forms tend to cause a gradual build-up of disability, although the speed is not the same for everyone.

Treatment has improved control of inflammatory activity for many people. Even when

symptoms are stable, follow-up and MRI scans may detect changes that are not yet noticeable. Regular review allows treatment, rehabilitation, and practical support to be adjusted.

Many people with MS continue working, exercising, travelling, having relationships, and raising families. Flexible hours, rest breaks, cooling measures, accessible transport, or mobility aids can help when symptoms interfere. Using an aid is a way to conserve energy and improve safety, not a sign that treatment has failed.

Pregnancy is possible for many people with MS. The condition itself does not usually prevent conception, but some treatments must be reviewed well before trying to become pregnant. Relapse patterns can change during pregnancy and after birth, so advance planning is important.

When to get medical help

Arrange a routine appointment with your MS team or usual healthcare professional if you notice gradual changes in walking, bladder control, pain, fatigue, memory, mood, or ability to manage daily tasks. Also report treatment side effects, repeated falls, or symptoms that are not well controlled.

Seek prompt medical advice for a new neurological symptom lasting more than 24 hours, such as reduced vision, new weakness, persistent numbness, or worsening balance. Infection, fever, overheating, and other conditions can temporarily worsen old symptoms, so an assessment may be needed before calling it a relapse.

Get urgent advice if you take a treatment that affects immunity and develop fever, a spreading rash, unusual shortness of breath, or signs of a significant infection.

Call emergency services for:

Sudden symptoms should not automatically be assumed to be MS.

- Sudden facial drooping, one-sided weakness, or difficulty speaking, which may be a stroke
- Severe breathing difficulty or an inability to swallow safely
- Loss of consciousness, a prolonged seizure, or sudden severe confusion
- Signs of a severe allergic reaction, such as facial swelling and breathing difficulty
- Immediate danger from suicidal thoughts or a mental health crisis

Common questions

Is MS fatal?

MS is not usually directly fatal. Many people live for decades after diagnosis. Severe disability and complications such as infections can affect health and may shorten life, particularly when MS is advanced.

Will I need a wheelchair?

Not everyone with MS needs a wheelchair. Some people never develop major walking difficulties. Others use a stick, walker, scooter, or wheelchair for safety, longer distances, or energy conservation. Early treatment and rehabilitation may help preserve function, but no individual course can be guaranteed.

Is MS hereditary?

MS is not inherited through a single gene in the usual way. Close relatives have a higher chance than the general population, but the overall chance for any one relative remains limited. Genetic susceptibility is only one part of the condition.

Can I exercise if I have MS?

Most people with MS can exercise, with activities adapted to their abilities. Strength, aerobic, balance, and flexibility work may all be useful. Temporary worsening with heat or exertion usually settles after cooling and rest and does not necessarily mean new nerve damage.

Can people with MS have children?

Yes. MS does not usually prevent pregnancy or parenthood. Pregnancy plans should be discussed early because some MS treatments need to be changed or paused, while suddenly stopping others may allow condition activity to return.

Is MS contagious?

No. You cannot catch MS from another person through contact, sex, blood, food, or shared living space.

Sources

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