**Multiple Sclerosis (MS)**

Multiple sclerosis (MS) damages the protective cover around nerves called myelin in your central nervous system. It can cause muscle weakness, vision changes, numbness and memory issues. While there isn’t a cure, treatment options can help you manage symptoms and slow disease progression.

**Overview**

**What is multiple sclerosis?**

Multiple sclerosis (MS) is an [autoimmune condition](https://my.clevelandclinic.org/health/diseases/21624-autoimmune-diseases) that affects your brain and spinal cord ([central nervous system](https://my.clevelandclinic.org/health/body/central-nervous-system-cns)).

With MS, your [immune system](https://my.clevelandclinic.org/health/body/21196-immune-system) mistakenly attacks [myelin](https://my.clevelandclinic.org/health/body/22974-myelin-sheath) cells. These are the protective covers (sheaths) that surround brain and spinal cord [nerves](https://my.clevelandclinic.org/health/body/22584-nerves). Myelin sheath damage interrupts messages (signals) that your nerves send throughout your body to perform functions like vision, sensation and movement.

Myelin damage can occur in your brain, spinal cord and nerves that supply your [eyes](https://my.clevelandclinic.org/health/body/21823-eyes). There’s no cure for MS, but treatment is available to help minimize ongoing damage from it and help you manage symptoms.

**What are the types of multiple sclerosis?**

There are four types of multiple sclerosis. You can think of the types as a way for your provider to describe your symptoms, instead of being four different conditions:

* **Clinically isolated syndrome (CIS)**: When you have the first episode of symptoms suggestive of MS, but don’t meet criteria for having MS, healthcare providers often categorize it as CIS. [Inflammation](https://my.clevelandclinic.org/health/symptoms/21660-inflammation) and myelin damage cause your symptoms. CIS may develop into multiple sclerosis.
* [**Relapsing-remitting multiple sclerosis (RRMS)**](https://my.clevelandclinic.org/health/diseases/14905-rrms-relapsing-remitting-multiple-sclerosis): This is the most common way that multiple sclerosis begins — an estimated 85% of people diagnosed with MS have this type. MS causes [flare-ups](https://health.clevelandclinic.org/ms-flare-up) (relapses or attacks) of new or old symptoms. Periods of remission follow (when symptoms stabilize or go away).
* **Secondary progressive multiple sclerosis (SPMS)**: In many cases, RRMS eventually progresses to SPMS. In the secondary progressive stage of multiple sclerosis, nerve damage accumulates and symptoms gradually worsen. You may still experience some relapses or flares, but periods of remission (when symptoms stabilize or go away) are less likely to happen.
* [**Primary progressive multiple sclerosis (PPMS)**](https://my.clevelandclinic.org/health/diseases/14202-primary-progressive-multiple-sclerosis-ppms): In some cases, MS symptoms may start off slowly and gradually worsen over time from the very beginning, without any periods of clear relapses or remission.

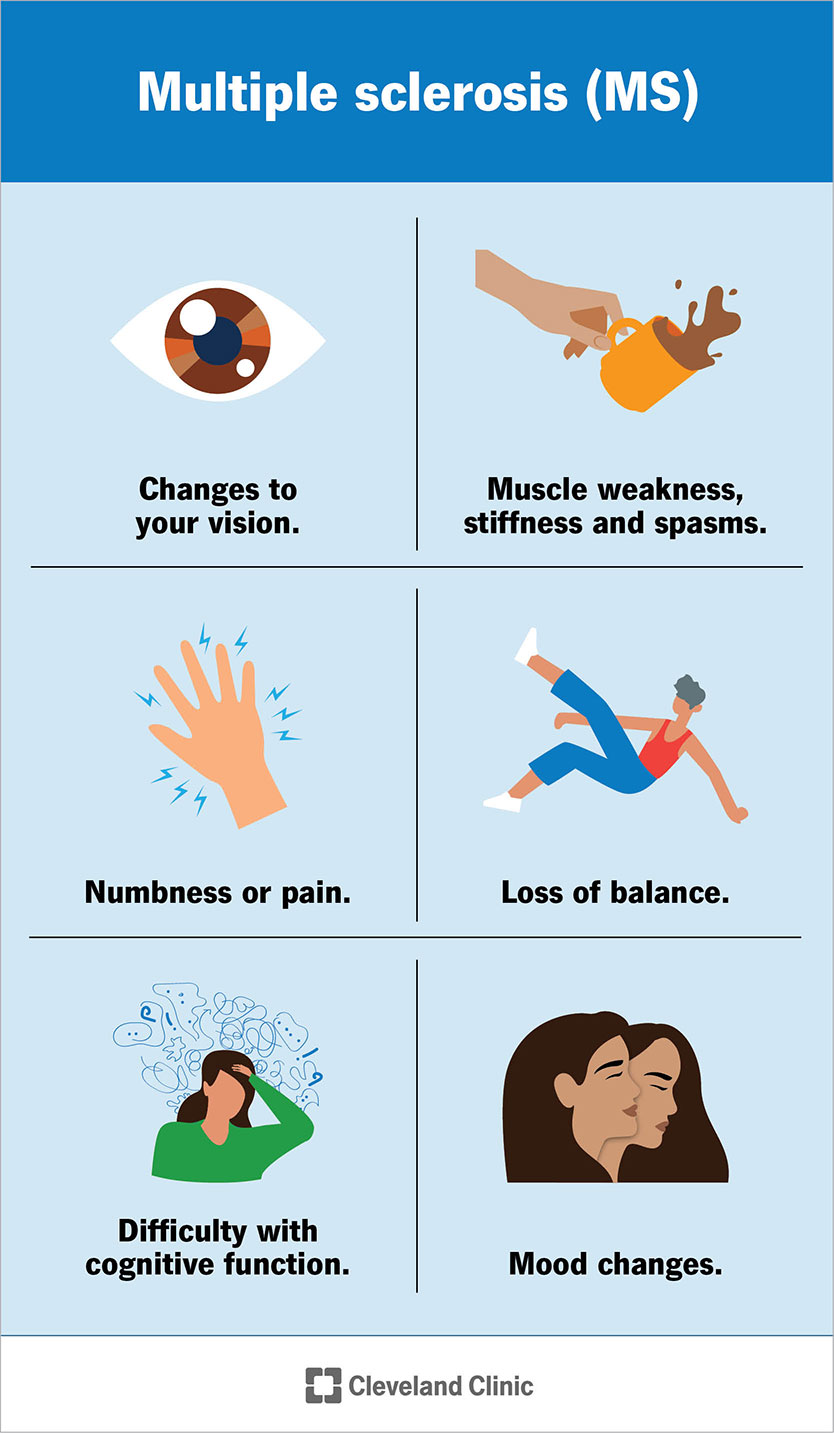
Three rare MS variants include:

* **Tumefactive multiple sclerosis**: A characterization of this variant of MS is the formation of large areas of demyelination in your brain, which may appear similar to tumors. Often, a sample of brain tissue is needed to differentiate this from other issues, like brain cancers.
* **Balo’s concentric sclerosis**: A characteristic of this variant of MS is lesions with the appearance of concentric rings (in the shape of a target) of myelin damage appearing on an MRI, which gives this condition its name.
* **Marburg variant multiple sclerosis**: This is a very rare and aggressive form of MS characterized by rapid progression, which may result in death when left untreated.

**How common is multiple sclerosis?**

Studies show that there are almost 1 million adults in the U.S. living with multiple sclerosis.

**Symptoms and Causes**

Multiple sclerosis symptoms affect your brain, spinal cord and eyes.

**What are the early symptoms of multiple sclerosis?**

Early signs and symptoms of MS include:

* Changes to your vision ([optic neuritis](https://my.clevelandclinic.org/health/diseases/14256-optic-neuritis), [double vision](https://my.clevelandclinic.org/health/diseases/22203-diplopia-double-vision), vision loss).
* Muscle weakness (usually affecting one side of your face or body, or below your waist).
* [Numbness](https://my.clevelandclinic.org/health/symptoms/21015-numbness) or abnormal sensations (usually affecting one side of your face or body, or below your waist).

**What are the symptoms of multiple sclerosis?**

Common symptoms of MS include:

* [Fatigue](https://my.clevelandclinic.org/health/symptoms/21206-fatigue).
* Clumsiness.
* [Dizziness](https://my.clevelandclinic.org/health/symptoms/6422-dizziness).
* Difficulty with bladder regulation
* Loss of balance and [coordination](https://my.clevelandclinic.org/health/symptoms/17748-ataxia).
* Difficulty with cognitive function (thinking, memory, concentration, learning and judgment).
* Mood changes.
* [Muscle stiffness](https://my.clevelandclinic.org/health/symptoms/25147-muscle-stiffness) and [muscle spasms](https://my.clevelandclinic.org/health/diseases/muscle-spasms-muscle-cramps) ([tremors](https://my.clevelandclinic.org/health/diseases/11886-essential-tremor)).

These symptoms vary from person to person and may fluctuate in severity from one day to the next. You may have a few of these symptoms but it’s unlikely you’ll experience all of them at once.

**Do you ever feel normal with MS?**

This can be challenging to predict because everyone perceives “normal” in their own way. With MS, you may have periods of remission where your symptoms go away, and you feel more like yourself. You might even forget you have MS until symptoms flare up (return) again. This feeling of normalcy, and the degree of normalcy, can vary by type and stage.

**What causes MS?**

Demyelination, or the destruction of myelin, causes multiple sclerosis. Myelin is a protective cover (sheath) around nerve cells (neurons) in your [brain](https://my.clevelandclinic.org/health/body/22638-brain) and [spinal cord](https://my.clevelandclinic.org/health/body/21946-spinal-cord). It moves messages (signals) between your brain and the rest of your body to control functions like vision, sensation and movement.

Your immune system’s job is to protect your body from things that can harm it, like bacteria or viruses. With MS, your immune system becomes overactive and mistakes healthy myelin (and sometimes, the nerve cells below the myelin) as a threat to your body. Your immune system’s attack on the healthy myelin damages it. This is demyelination.

On an imaging test (an MRI), your provider can find evidence of myelin damage. They may refer to it as a scar, lesion or plaque. Messages don’t pass between nerve cells easily where there is myelin damage, which leads to the development of MS symptoms.

Experts aren’t sure why some people develop MS. Research suggests the following may contribute to an elevated risk of developing MS:

* Smoking.
* Toxin exposure, like [secondhand smoke](https://my.clevelandclinic.org/health/articles/10644-secondhand-smoke-dangers) and pesticides.
* [Low levels of vitamin D](https://my.clevelandclinic.org/health/diseases/15050-vitamin-d-vitamin-d-deficiency).
* Exposure to a virus ([Epstein-Barr virus](https://my.clevelandclinic.org/health/diseases/23469-epstein-barr-virus) or [mononucleosis](https://my.clevelandclinic.org/health/diseases/13974-mononucleosis)).
* [Obesity](https://my.clevelandclinic.org/health/diseases/11209-weight-control-and-obesity) during childhood.
* Genetic predisposition (someone in your biological family has the condition or carries genes, which lead to you being more susceptible to developing the disease).

**What are the risk factors for multiple sclerosis?**

You may be more at risk of MS if you:

* Are between ages 20 and 40.
* Are of Northern European descent.
* Are [assigned female at birth](https://health.clevelandclinic.org/afab-and-amab-meaning).

MS can affect anyone. Rarer cases can affect [children](https://my.clevelandclinic.org/health/diseases/17337-pediatric-multiple-sclerosis).

**What are the complications of multiple sclerosis?**

Worsening or progressive symptoms of MS may lead to complications such as:

* Difficulty walking without assistance.
* Loss of bowel or bladder control.
* [Memory loss](https://my.clevelandclinic.org/health/symptoms/11826-memory-loss).
* [Sexual dysfunction](https://my.clevelandclinic.org/health/diseases/9121-sexual-dysfunction).
* [Depression](https://my.clevelandclinic.org/health/diseases/9290-depression) and [anxiety](https://my.clevelandclinic.org/health/diseases/anxiety-in-children).

**Diagnosis and Tests**

**How is multiple sclerosis diagnosed?**

There isn’t a single diagnostic tool available to pinpoint the condition. Instead, a provider will diagnose MS after a [physical exam](https://my.clevelandclinic.org/health/diagnostics/17366-physical-examination), a [neurological exam](https://my.clevelandclinic.org/health/diagnostics/22664-neurological-exam) and testing. During an exam, your provider will learn more about your symptoms and medical history. Testing may include blood work, MRIs of your brain and spinal cord, and an analysis of your spinal fluid.

It can take time before you receive an official MS diagnosis. You may need to make multiple trips to see your provider before you know for sure. This happens because MS symptoms can look like or happen with several other common conditions. While the delay in an official diagnosis can be frustrating, getting the right diagnosis helps your provider accurately treat your symptoms.

**What tests diagnose multiple sclerosis?**

Diagnostic testing helps your provider rule out conditions with similar symptoms to MS. It may include:

* [Blood tests](https://my.clevelandclinic.org/health/diagnostics/24508-blood-tests) and urine tests.
* A magnetic resonance imaging test ([MRI](https://my.clevelandclinic.org/health/diagnostics/4876-magnetic-resonance-imaging-mri)).
* An [optical coherence tomography](https://my.clevelandclinic.org/health/diagnostics/17293-optical-coherence-tomography) (OCT) test.
* A [lumbar puncture](https://my.clevelandclinic.org/health/diagnostics/12544-lumbar-puncture-spinal-tap).
* [Evoked potential (EP) test](https://my.clevelandclinic.org/health/diagnostics/12393-evoked-potential-test).

**Who diagnoses MS?**

If your primary care provider suspects you may have MS, they may refer you to see a [neurologist](https://my.clevelandclinic.org/health/articles/22277-neurologist). A neurologist is a doctor who specializes in treating conditions that affect the [nervous system](https://my.clevelandclinic.org/health/body/21202-nervous-system), which includes your brain and spinal cord.

**Management and Treatment**

**Is there a cure for multiple sclerosis?**

There isn’t currently a cure for MS.

**How is multiple sclerosis treated?**

Multiple sclerosis treatment focuses on minimizing further damage, managing symptoms and preventing complications. Your treatment plan may include:

* Medications.
* Physical, occupational or speech therapy.
* Mental health counseling.

Other types of symptom management vary based on how the condition affects you. It may include:

* Wearing glasses or taking medications for vision symptoms.
* [Deep brain stimulation](https://my.clevelandclinic.org/health/treatments/21088-deep-brain-stimulation) for muscle spasms (tremors).
* Using assistive mobility devices like a cane, walker or wheelchair.
* [Antiseizure medications](https://my.clevelandclinic.org/health/treatments/24781-antiseizure-medications-anticonvulsants) or antispasmodic medications ([gabapentin](https://my.clevelandclinic.org/health/drugs/21561-gabapentin) or [nortriptyline](https://my.clevelandclinic.org/health/drugs/20068-nortriptyline-capsules)) for pain.
* Medications like [donepezil](https://my.clevelandclinic.org/health/drugs/19848-donepezil-tablets) for cognitive symptoms.
* Alternative therapies like [acupuncture](https://my.clevelandclinic.org/health/treatments/4767-acupuncture) and [yoga](https://my.clevelandclinic.org/health/treatments/24889-yoga-therapy).

Your healthcare provider may recommend plasma exchange ([plasmapheresis](https://my.clevelandclinic.org/health/treatments/24197-plasmapheresis-plasma-exchange)) if your body doesn’t respond well to certain medications in the midst of an MS attack. This is more effective in minimizing damage from an ongoing attack as opposed to preventing additional attacks in the long term.

Your provider can also discuss if any clinical trials are available for you to participate in. Clinical trials are tests of new medications or uses of existing medications on humans to find new treatment options for MS and other conditions.

**Multiple sclerosis medications**

Medications for multiple sclerosis can reduce relapses (periods when symptoms worsen or new symptoms develop) and the development of new lesions/scars, and slow the disease’s progression. Common types of medications for MS include:

* **Disease-modifying therapies (DMTs)**: DMTs reduce how often you have relapses, slow down MS progression and prevent new lesions from forming on your brain and spinal cord. Several medications have U.S. Food and Drug Administration (FDA) approval for long-term MS treatment.
* **Relapse management medications**: For severe symptom attacks, [corticosteroids](https://my.clevelandclinic.org/health/drugs/4812-corticosteroids) (like [methylprednisolone](https://my.clevelandclinic.org/health/drugs/19300-methylprednisolone-tablets)) quickly reduce inflammation by suppressing your immune system. These medications can speed up your recovery time after an attack. They also slow damage to the myelin sheath surrounding your nerve cells. Your provider may give you this medication into a vein in your arm through an IV (intravenously). Other short-term treatments for severe attacks include IV immunoglobulin therapy or plasma exchange.

**DMTs for MS**

Common disease-modifying therapies (DMTs) for MS and their administration types include:

* **Injections into your skin**: [Beta interferon](https://my.clevelandclinic.org/health/drugs/19250-interferon-beta-1b-injection), [glatiramer](https://my.clevelandclinic.org/health/drugs/19070-glatiramer-injection) acetate or ofatumumab.
* **Infusions into a vein (IV)**: [Alemtuzumab](https://my.clevelandclinic.org/health/drugs/24709-alemtuzumab-injection-multiple-sclerosis), [natalizumab](https://my.clevelandclinic.org/health/drugs/18007-natalizumab-injection), rituximab, [ocrelizumab](https://my.clevelandclinic.org/health/drugs/18442-ocrelizumab-injection) or ublituximab.
* **Oral medications (taken by mouth)**: [Cladribine](https://my.clevelandclinic.org/health/drugs/21388-cladribine-tablets), [dimethyl fumarate](https://my.clevelandclinic.org/health/drugs/18294-dimethyl-fumarate-oral-delayed-release-capsules), [diroximel fumarate](https://my.clevelandclinic.org/health/drugs/21225-diroximel-fumarate-delayed-release-capsules), monomethyl fumarate, [fingolimod](https://my.clevelandclinic.org/health/drugs/19269-fingolimod-capsules), [siponimod](https://my.clevelandclinic.org/health/drugs/21275-siponimod-tablets" \t "_blank), ponesimod, ozanimod or [teriflunomide](https://my.clevelandclinic.org/health/drugs/18918-teriflunomide-oral-tablets).
* [**Stem cell transplant**](https://my.clevelandclinic.org/health/treatments/22567-stem-cell-transplants).

**Prevention**

**Can multiple sclerosis be prevented?**

There isn’t a known way to prevent MS.

**How can I lower my risk of multiple sclerosis symptom flare-ups?**

Disease-modifying therapies are the most effective way to reduce the number of flare-ups (also called relapses or attacks) you experience.

Leading a healthy lifestyle is also important. The choices you make can help slow disease progression. Your provider may recommend the following to stay healthy:

* Eating nutritious meals.
* Getting enough [sleep](https://my.clevelandclinic.org/health/body/12148-sleep-basics).
* Participating in physical activities regularly.
* Not using [tobacco](https://my.clevelandclinic.org/health/articles/17488-smoking) products.

Coping with a chronic condition can be emotionally challenging. MS can sometimes affect your mood and memory. Working with a [neuropsychologist](https://my.clevelandclinic.org/health/articles/24691-neuropsychologist) or a mental health provider is an essential part of managing the condition long term.

**Outlook / Prognosis**

**What’s the outlook for multiple sclerosis?**

Multiple sclerosis is a lifelong condition without a cure. However, available treatment options are very effective in helping manage symptoms and minimize the frequency of flare-ups. Regardless of treatment, MS can lead to disability and make it difficult to do routine things without assistance over time. Your care team is available to help you throughout your MS journey, to take steps to prevent complications and to improve your quality of life.

**Does multiple sclerosis affect your life expectancy?**

You can expect to have a normal life expectancy with MS. Older studies have shown that MS can take up to 10 years off your life expectancy, but advances in treatment options have significantly improved this outlook. Only in very rare cases is MS fatal.

**Living With**

**Can a person with MS live a normal life?**

Yes. MS can be a challenging condition to diagnose and manage, but your care team will help you every step of the way. Despite having a condition without a cure, you can still lead a fulfilling and active life with MS. Support is available to help you maximize your function both physically and mentally, from medications to therapy. There are even support groups you can join to help you connect with people who share a similar experience.

**When should I see a healthcare provider?**

You should contact a healthcare provider if you experience the following:

* Feeling overly sensitive to heat.
* Feeling unsteady or off balance.
* Difficulty remembering things.
* Numbness or tingling, especially in your arms or legs.
* Sudden vision changes.
* Weakness in your arms or legs.

Let your healthcare provider know if you have MS and experience new or worsening symptoms.

**What questions should I ask my healthcare provider?**

You may want to ask your healthcare provider:

* What kind of treatment do you recommend?
* How often should I participate in physical therapy?
* Are there side effects of the medications you prescribed?
* When and how often should I take medications?
* What symptoms should I look out for?
* Can you offer advice on how to maintain good health?
* Can you recommend any support groups?

**A note from Cleveland Clinic**

Multiple sclerosis (MS) is a disruptive condition. Symptoms can flare up or get worse without any notice. MS can also make you more likely to injure yourself if you lose balance. A healthcare provider can help you manage this condition so you can get back to your routine safely. You may need to adapt your lifestyle as the condition progresses, like using mobility devices or wearing glasses. But most people with MS lead full and active lives with the support of their care team. Let your providers know if you have any questions about your treatment options or what symptoms or complications to look out for.

