

DISEASE-MODIFYING THERAPIES FOR MULTIPLE SCLEROSIS

PATIENT TREATMENT RESOURCE

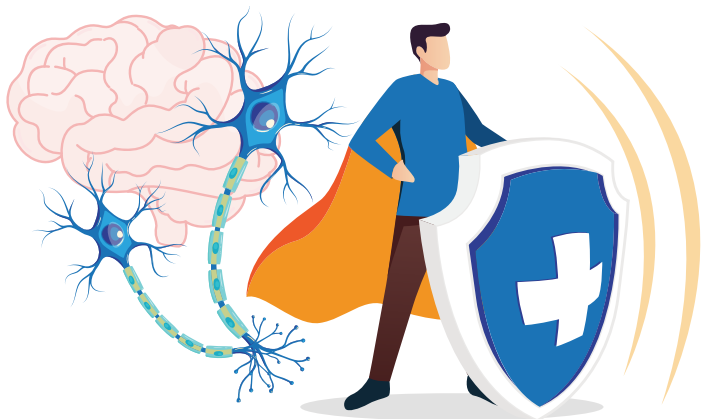
What are DMTs?

Disease-modifying therapies (DMTs) are treatments designed to manage the progression of multiple sclerosis (MS). Although they can't cure MS, DMTs can reduce the frequency and severity of relapses and slow down the long-term damage MS can cause.



How do DMTs work?

DMTs help control MS by modifying the immune system's activity. They make it less likely for the immune system to attack the nerves in your brain and spinal cord. This reduces inflammation and prevents new damage. Although DMTs can't repair already damaged nerves, they can slow the progression of MS and prevent further damage.



Why start DMT early?

Research shows that starting an FDA-approved DMT early and staying on it can improve your quality of life over the long term. DMTs can:

- Lower the number of MS relapses
- Slow the progression of the disease
- Limit new inflammation in the brain and spinal cord

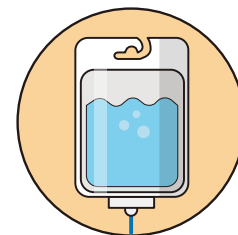
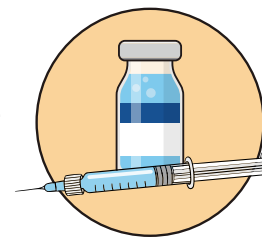
By starting treatment early, you can make the most of these benefits and better manage your MS as you move forward.



Types of DMTs

Several FDA-approved treatments are available to help manage MS, and they come in different forms:

- **Self-Injections:** Medicines you inject yourself at home, usually on a regular schedule. These can be given as a shot into one of your muscles (intramuscular) or just beneath your skin (subcutaneous).
- **Oral Pills:** Medications taken by mouth, which may be daily or on another schedule depending on the specific drug.
- **Intravenous (IV) Infusions:** Medicines given through a needle into a vein, usually at a clinic or hospital.



Most DMTs are used for relapsing types of MS, including:

Relapsing-Remitting MS (RRMS):

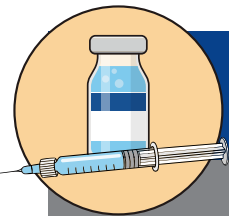
The most common form, with periods of worsening symptoms (relapses) followed by improvement (remissions).

Active Secondary Progressive MS (SPMS):

MS that gets worse over time with few or no periods of improvement.

Clinically Isolated Syndrome (CIS):

One episode of neurological symptoms



INJECTABLE DMTs

Drug	Brand Name	Approved For	How It's Taken	Potential Serious Side Effects	Most Common Side Effects
BETA INTERFERON DRUGS	Interferon beta-1a	Avonex® Rebif®	Relapsing MS (CIS, RRMS, or active SPMS) Avonex: Intramuscular injection 3x per week Rebif: Subcutaneous injection 3x per week	Liver failure, depression, suicidal thoughts	All beta interferon drugs: Injection-site reactions: Swelling, pain, or redness at the injection site Flu-like symptoms: Chills, fever, muscle pain, tiredness, weakness, headache Betaseron and Extavia: Decreased white blood cell count, skin breakdown at injection site, difficulty sleeping, abdominal pain, high liver enzymes on blood test
	Peginterferon beta-1a	Plegridy®	Relapsing MS (CIS, RRMS, or active SPMS) Subcutaneous or intramuscular injection every 14 days	Liver failure, depression, suicidal thoughts	
	Interferon beta-1b	Betaseron® Extavia®	Relapsing MS (CIS, RRMS, or active SPMS) Subcutaneous injection every other day	Liver failure, depression, suicidal thoughts	
Glatiramer acetate	Copaxone® glatiramer acetate injection Glatopa®	Relapsing MS (CIS, RRMS, or active SPMS)	Subcutaneous injection every day or every 3 days	Skin necrosis, lipoatrophy (loss of fatty tissue beneath the skin), liver failure	Injection-site reactions, flushing, rash, difficulty breathing, chest pain
Ofatumumab	Kesimpta®	Relapsing MS (CIS, RRMS, or active SPMS)	Subcutaneous injection once a month, after starting with injections 3x per week	Hepatitis B reactivation, progressive multifocal leukoencephalopathy (PML, a rare but serious brain infection) injection-related reactions, low immunoglobulins	Upper respiratory tract infections, headache



ORAL DMTs

Drug	Brand Name	Approved For	How It's Taken	Potential Serious Side Effects	Most Common Side Effects
Cladribine	Mavenclad®	Relapsing MS (RRMS or active SPMS; not CIS)	2-year course: Year 1: Take for 4 or 5 days in a row in Month 1 and again in Month 2. Year 2: Take for 4 or 5 days in Month 12.	Increased risk of cancer, birth defects, low blood cell counts, serious infections, PML, liver injury, allergic reactions, heart failure	Upper respiratory tract infections, headache, decreased white blood cell count
Dimethyl fumarate	Tecfidera®	Relapsing MS (CIS, RRMS, or active SPMS)	Twice daily	Allergic reactions, PML, decreased white blood cell counts, liver injury, herpes simplex virus (shingles) and other infections, gastrointestinal problems	Flushing, redness, itching, rash Nausea, vomiting, diarrhea, stomach pain, indigestion Diroximel fumarate generally has fewer gastrointestinal side effects than dimethyl fumarate.
Diroximel fumarate	Vumerity®				
Fingolimod	Gilenya® Tascenso ODT®	Relapsing MS (CIS, RRMS, or active SPMS)	Once daily	Slow heart rate, swelling in brain blood vessels, fetal harm, increased risk of infections, PML, severe inflammation, vision problems, liver injury, breathing problems, high blood pressure, skin cancer, allergic reactions	Headache, high liver enzymes on blood test, diarrhea, cough, flu, sinusitis, back pain, abdominal pain, arm or leg pain
Monomethyl fumarate	Bafiertam®	Relapsing MS (CIS, RRMS, or active SPMS)	Twice daily	Anaphylaxis, angioedema (swelling beneath the skin), PML, herpes zoster and other serious opportunistic infections, lymphopenia (low levels of white blood cells), liver injury	Flushing, abdominal pain, diarrhea, nausea
Ozanimod	Zeposia®	Relapsing MS (CIS, RRMS, or active SPMS)	Once daily	Serious infections, PML, slow heart rate, liver injury, fetal harm, high blood pressure, breathing problems, vision problems, skin cancer, reversible brain swelling	Upper respiratory tract infections, high liver enzymes on blood test, orthostatic hypotension, urinary tract infections, back pain, high blood pressure, upper abdominal pain
Ponesimod	Ponvory®	Relapsing MS (CIS, RRMS, or active SPMS)	Once daily	Same as above	Upper respiratory tract infections, high liver enzymes on blood test, high blood pressure
Siponimod	Mayzent®	Relapsing MS (CIS, RRMS, or active SPMS)	Once daily	Same as above	Headache, high blood pressure, high liver enzymes on blood test
Teriflunomide	Aubagio®	Relapsing MS (CIS, RRMS, or active SPMS)	Once daily	Liver injury, fetal harm, decreased white blood cell count, serious infections, neuropathy (nerve damage leading to pain, weakness, numbness or tingling), high blood pressure	Headache, diarrhea, nausea, alopecia, high liver enzymes on blood test



INFUSED DMTs

Drug	Brand Name	Approved For	How It's Taken	Potential Serious Side Effects	Most Common Side Effects
Alemtuzumab	Lemtrada®	Patients with relapsing MS, including active SPMS, who haven't responded well to at least 2 other treatments	<p>Course 1: 5 days of infusions</p> <p>Course 2: 3 days of infusions, 1 year later</p> <p>Additional courses (if needed): 3 days of infusions, at least 1 year after the last treatment</p>	Serious autoimmune conditions, serious infusion reactions, stroke, increased risk of certain cancers, hyperthyroidism, low blood cell counts, liver inflammation, overactivity of immune system that is possibly fatal, thrombotic thrombocytopenic purpura (rare condition where platelets clump and block blood flow), bleeding disorders, serious infections, PML, inflammation of gallbladder, inflammation of lung tissue	<p>Skin: Rash, hives, itching, sudden redness in the face, neck, or chest</p> <p>Ears/nose/throat: Nasopharyngitis (swelling of nose and throat), sinusitis, mouth sores, sore throat</p> <p>Gastrointestinal: Nausea, vomiting, diarrhea, stomach pain</p> <p>Musculoskeletal: Pain in arms/legs/back/joints</p> <p>Neurological: Headache, tingling sensations, dizziness</p> <p>Endocrine: Thyroid problems</p> <p>General/Infection: Fever, feeling tired, trouble sleeping, urinary tract infections, upper respiratory tract infections, fungal infections, herpes simplex virus infections</p>
Natalizumab	Tysabri®	Relapsing MS (CIS, RRMS, or active SPMS)	Every 4 weeks	PML, infusion reactions, herpes simplex virus and other infections, autoimmune hepatitis Due to the risk of PML, natalizumab and natalizumab-sztn are available only through special programs to carefully manage and monitor their use.	Headache, feeling tired, infusion reactions, urinary tract infections, joint stiffness, depression, pain in extremity, rash, gastroenteritis, vaginitis
Natalizumab-sztn (natalizumab biosimilar)	Tyruko®				
Ocrelizumab	Ocrevus®	Relapsing MS (CIS, RRMS, or active SPMS) Primary progressive MS	<p>Starting treatment: infusions on day 1 and day 15</p> <p>Ongoing treatment: infusions every 6 months</p>	Severe infusion reactions, hepatitis B reactivation, infections (PML, COVID-19), potentially increased risk of cancer, immune colitis (inflammation in colon), pyoderma gangrenosum (skin ulcers), babesiosis (tick-borne blood infection)	Upper respiratory tract infections, infusion reactions, skin infections, and lower respiratory tract infections
Ublituximab	Briumvi®	Relapsing MS (CIS, RRMS, or active SPMS)	<p>Starting treatment: infusions on day 1 and day 15</p> <p>Ongoing treatment: infusions every 6 months</p>	Infusion reactions, infections, hepatitis B reactivation, low immunoglobulins, fetal risk	Infusion reactions, upper respiratory tract infections

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Choosing the Right DMT for Me

Choosing the right DMT is an important decision that can affect your daily life and your journey with MS. It's essential to consider different factors and discuss them with your healthcare provider to find the best treatment option for you. Here are some key points to help guide your decision-making process.

Factors to Consider:

- **Disease Type and Severity:** Different DMTs are designed for various forms and stages of MS. Your healthcare provider will help you choose a DMT that best fits the type of MS you have, whether it's relapsing MS, secondary progressive MS, or another form.
- **Lifestyle and Preferences:** Consider how each DMT fits into your daily routine. For example, some treatments are taken daily in pill form, and others may require monthly injections or infusions at a clinic. Think about what fits best with your schedule and comfort level.
- **Side Effects:** Each DMT comes with possible side effects. Discuss these with your healthcare provider to determine which side effects are manageable and which might be challenging. Balancing the benefits with the side effects is crucial.
- **Medical History:** Your medical history, including other health conditions and current medications, can influence which DMT is best for you. Certain DMTs might interact with other medications you're taking or be less suitable based on your health history.



Consult With Your Healthcare Provider:

- **Discuss Your Goals:** Be clear about what you want to achieve with your DMT, such as having fewer relapses, slowing disease progression, improving your quality of life, and limiting side effects of the medicine. Reviewing your goals will help guide your choice of treatment.
- **Review Your Options:** Your healthcare provider can explain the benefits and drawbacks of different DMTs based on your health needs and personal preferences. They can help you compare options to find the best fit for you.

Monitoring and Adjusting Your Treatment:

- **Monitoring:** Regular check-ups will be necessary to monitor how well the DMT is working and check for any side effects. Your healthcare provider will use this information to determine if the treatment is effective and if any adjustments are needed.
- **Adjustments:** If the DMT isn't working as expected or if you experience serious side effects, your healthcare provider may recommend trying a different DMT. Regularly visiting your healthcare provider and staying engaged in your care plan can help you effectively manage your MS.



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Questions to Ask Your Healthcare Provider

Before starting a DMT, it's important to discuss key topics with your healthcare provider to make sure it's the right choice for you. Consider asking these questions to get a clear understanding of how the treatment will work, its benefits and risks, and how it will fit into your life:



- What types of DMTs are available for me?
- How does this DMT compare with other options in terms of effectiveness and side effects?
- What are the expected benefits of this treatment?
- How long will it take to see these benefits?
- How is this medication taken?
- How often will my MS need to be monitored?
- What happens if I miss a dose or need to stop the medication?
- What side effects should I be aware of?
- What are the chances of serious side effects with this medication?
- What should I do if I experience a side effect?
- Are there any interactions with other medications or supplements I'm taking?

List your current medications/supplements: _____

- How will this treatment affect my daily life?
- Is it safe to take this medication if I am pregnant, planning to become pregnant, or breastfeeding or if my partner is planning to have a child?
- What is the cost of this DMT, and will my insurance cover it?

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Tips for Staying on Track With Your Treatment



Set Reminders:

Use alarms or apps to keep track of your treatment schedule, which may include pills, injections, or infusions and courses.

Organize Your Medications:

Keep your medications in a visible and organized place to make it easier to remember your doses.

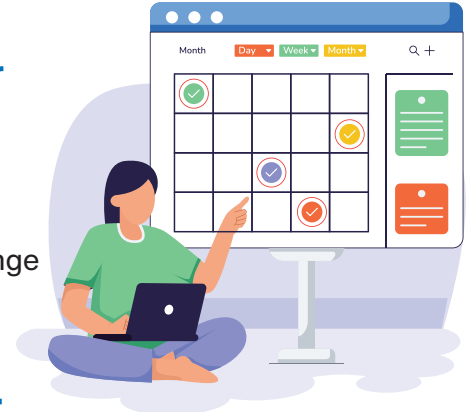


Track Your Symptoms and Side Effects:

Keep a journal of how you're feeling and any side effects you experience to share with your healthcare provider. This information can help if your treatment plan needs to be adjusted.

Plan Ahead for Infusions:

If your treatment involves infusions, schedule them in advance and arrange transportation if needed.



Stay Informed:

Educate yourself about your treatment and stay in regular contact with your healthcare provider. Knowing what to expect can help you stay committed to your treatment plan.



Helpful Resources

National MS Society

Provides valuable information for patients and caregivers about MS, treatment options, and financial assistance programs. Visit their website to learn more and connect with a personal MS Navigator that can support your journey with MS.

<https://www.nationalmssociety.org/resources/get-support/ms-navigator>

Multiple Sclerosis Association of America

A nonprofit organization that provides resources and support for people with MS, including an extensive library of on-demand video programming, webcasts, and webinars.

<https://mymsaa.org>

Can Do Multiple Sclerosis:

A national nonprofit organization that delivers health and wellness education programs designed to empower people with MS, including information on DMT and practical strategies for managing MS symptoms.

<https://cando-ms.org>

Infusion Access Foundation

A nonprofit organization that offers an online Infusion Center Locator to help you find facilities across the U.S. where you can receive IV or injectable treatments.

<https://www.infusionaccessfoundation.org/locator>