

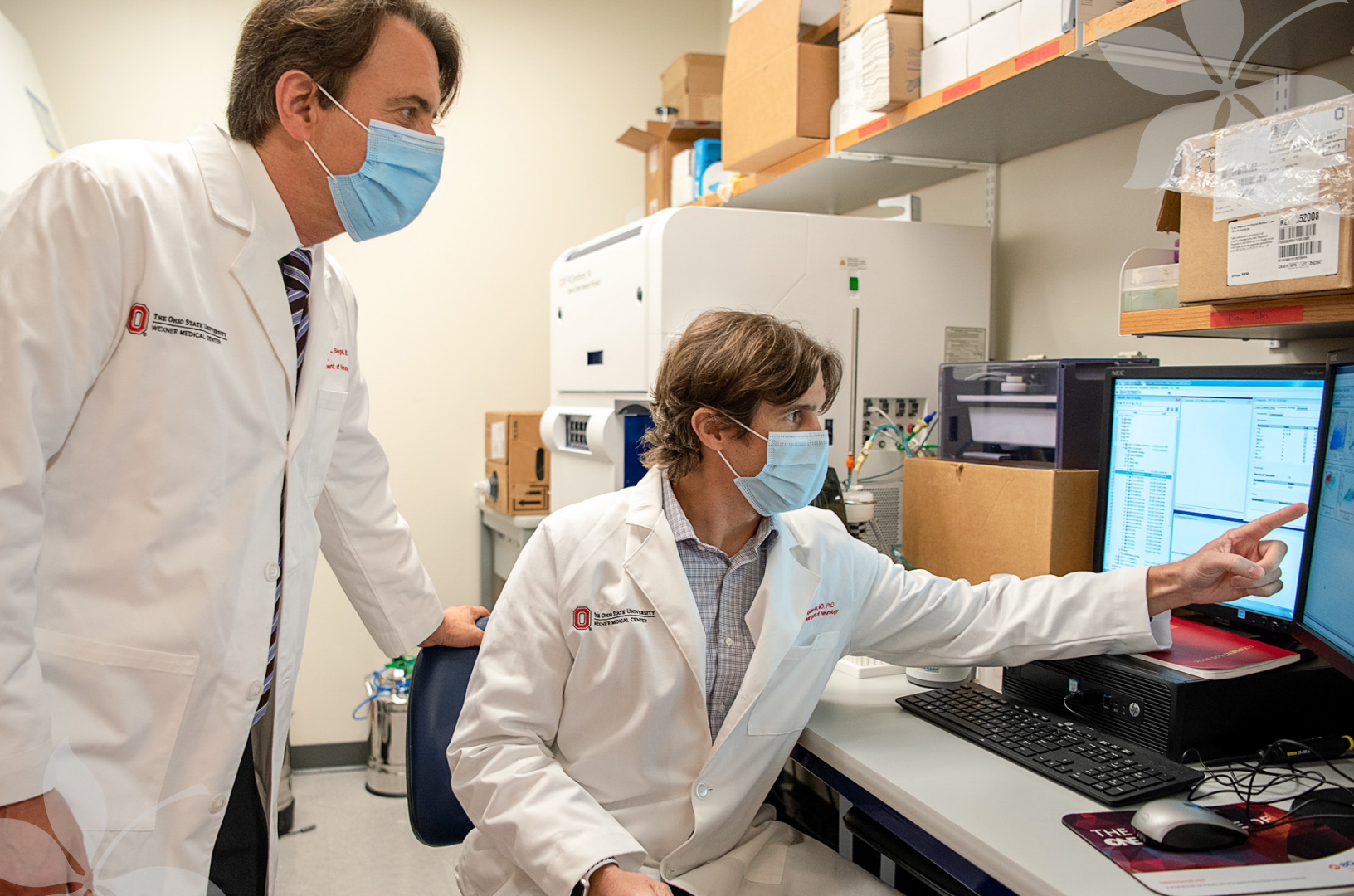


OHIO STATE MULTIPLE SCLEROSIS CENTER

Understanding multiple sclerosis
and minimizing its impact on your life.



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER



Thank you for downloading our guide to understanding multiple sclerosis

A diagnosis of multiple sclerosis, or MS, can feel overwhelming. You need information, reassurance and a treatment plan that helps you maintain the very best quality of life.

The MS experts at The Ohio State University Wexner Medical Center understand that uncertainty can be unnerving. This guide will provide answers to some of the most common questions about MS and how it can affect your future, while also sharing recent advancements and reasons for optimism.

After reviewing this guide, it's inevitable that you'll still have questions. Please know that the entire team at Ohio State's Multiple Sclerosis Center is ready to partner with you and provide the care, resources and support you need to move forward with confidence.

To schedule an appointment with an Ohio State MS specialist, please call us at 614-293-4969.



UNDERSTANDING MULTIPLE SCLEROSIS AND MINIMIZING ITS IMPACT ON YOUR LIFE

THE PATH FORWARD

If you've recently been diagnosed with multiple sclerosis or it's been presented as a possibility, it's likely that you are understandably worried and have more questions than answers.

The team at the Multiple Sclerosis Center at Ohio State has information that we hope eases your concerns and shows you that there's a path forward.

Although MS is a chronic disease, there are effective therapies that can slow or halt disease progression and minimize your symptoms. That means MS becomes just part of your life — it doesn't control or dictate it.

THE FACTS

What is multiple sclerosis?

When someone has MS, a person's immune system attacks and injures the myelin sheath, the protective shield around nerves in the central nervous system. This includes nerves in the brain and spine, as well as optic nerves.

As a result, communication between the central nervous system and the rest of the body is interrupted, causing a variety of symptoms.



PERSONALIZED MS CARE AT OHIO STATE

You'll find world-renowned experts in MS at the Ohio State Wexner Medical Center who are determined to minimize its role in your daily life through treatments that target your most persistent challenges and minimize side effects.

- You're treated as a whole person at Ohio State, not as a set of separate symptoms. That means your entire care team understands all aspects of your condition and coordinates your treatment and appointments.
- Depending on your specific challenges, you may work with a neurologist, infusion nurse, social worker, urologist, psychiatrist, neuro-psychologist, neuro-radiologist, ophthalmologist, physical therapist, speech therapist, dietitian, sleep medicine specialist and pharmacist.
- We also routinely partner with other specialists if you have a medical issue that can affect or be affected by MS. For example, women diagnosed with MS who want to become or are already pregnant benefit from regular consultation between their Ob/Gyn and MS care team.
- Promising research right here at Ohio State means that even more breakthrough therapies may be available in the very near future.

Our ultimate goal is to help you manage your MS and do all that's possible to keep both symptoms and treatment from interrupting other aspects of your life and plans.

**Schedule an
appointment at Ohio State's
Multiple Sclerosis Center
614-293-4969.**



Types of MS

Multiple sclerosis can occur off and on, or be evident on a more ongoing basis. The goal of any treatment is to minimize symptoms, decrease the frequency of episodes and make the disease “dormant” or no longer actively causing symptoms.

MS generally falls into one of four categories, and a patient can progress from one form to another:

- **Clinically isolated syndrome (CIS)** – This type of MS appears initially as a single episode when a small area of damage, known as a lesion, appears.
 - Symptoms will depend on where the lesion develops. Vision loss in one eye indicates a lesion on the optic nerve. If the spinal cord is involved, this may cause numbness or weakness in one or more limbs, as well as bladder control issues. If the nerves in your brain are affected, you may suffer double vision, vertigo and loss of balance when walking.
 - If you’re diagnosed with CIS, you’re at higher risk of developing a more persistent form of MS, so you may be prescribed medicine to prevent future relapse or return of the disease.



- **Relapsing-remitting (RRMS)** – This type of MS is characterized by repeated episodes that come and go or become progressively worse before a full or partial recovery.
 - Return episodes are referred to as relapses, and they typically last weeks to months. Lesions either form in a new location with each relapse or become larger in a previously affected area of the central nervous system.
 - During a remission, which is the time period between episodes of active lesions, some symptoms may go away, while others persist, which is frequently the case with fatigue or muscle spasms.
 - Most people who develop MS have this relapsing-remitting course at the beginning.
 - RRMS is two to three times more common in women than in men, and it's usually diagnosed in young adulthood (20s and 30s).
- **Secondary progressive (SPMS)** – This is a phase of MS that follows the relapsing-remitting course in some individuals.
 - It's called progressive because neurological disabilities steadily or gradually worsen.
 - Common symptoms include growing weakness or numbness in one or more limbs, balance issues while walking and memory difficulties.
 - SPMS typically starts after a patient has had the relapsing-remitting form of MS for 15 to 20 years. However, not all patients with RRMS develop SPMS.
 - Treatment is most effective when SPMS is active.
- **Primary progressive (PPMS)** – From initial diagnosis, this form of MS causes steadily worsening disability without the previous relapses and remissions seen with other forms of MS.
 - PPMS is equally common in men and women and is generally diagnosed in mid-life (40s to 50s).
 - As in SPMS, some people with PPMS experience relapses or develop new lesions.
 - Treatment during these active phases focuses on slowing disease progression.





The varied symptoms of MS

Symptoms vary by individual and depend on what nerves within the central nervous system are being attacked. Symptoms can literally vary hour-to-hour or day-to-day and often affect movement and vision. Common MS symptoms may include:

- **Issues with muscles and motor skills**
 - Weakness in one or more limbs, foot drop/leg dragging, stiffness and cramping of the muscles (spasticity), weak hand grip, a feeling of leg heaviness
- **Changes in vision**
 - Blurred, foggy or hazy vision in one or both eyes, dulled color vision, pain behind or at the corner of an eye (often triggered by eye movement), blindness and double vision
 - Optic neuritis — diminished vision in one eye that is often painful — is a fairly common first symptom of MS
- **Fatigue**
 - Feeling very tired is one of the most common symptoms of MS
 - It can be worse if symptoms such as pain, spasticity, bladder problems, anxiety or depression make it hard to sleep
 - Fatigue can occur even in the absence of sleep problems
- **Sensory problems**
 - Tingling, pins-and-needles sensations, numbness in one or more limbs, a band of tightness around the chest or abdomen, burning pains

or hypersensitivity to temperature or touch, stabbing facial pain, electrical sensations down the neck or back that are triggered by looking down

- **Balance and coordination issues**
 - Unsteady walking and frequent falling, veering to one side, loss of hand/finger dexterity, deterioration of handwriting, vertigo (room spinning), tremor
- **Problems walking**
 - Weak legs and balance problems may make walking difficult. Assistive devices, such as a cane, brace, rol-lator or wheelchair, may be needed some or all of the time
- **Bladder issues**
 - Inability to hold urine (urinary incontinence), sensing bladder fullness after completely emptying the bladder
- **Constipation and other bowel disorders**
- **Sexual issues**
 - Male erectile dysfunction and female sexual dysfunction
- **Difficulty with swallowing; choking on liquids or solids**
- **Slurred or uneven speech**
- **Cognitive and emotional problems**
 - Memory loss, difficulty multitasking, uncontrollable crying or laughing are more common in people who have had MS for some time
 - Depression is more common among people with MS than in the general population



Investing time in an accurate diagnosis

Because the symptoms of MS are sometimes mild initially and are similar to so many other conditions, finding a quick, definitive diagnosis can be challenging. Although the time needed for diagnosis may frustrate you, know that it's time well invested.

- An accurate diagnosis, including the exact type of MS you have, will help doctors determine the best therapy.
- Ongoing testing will help your care team minimize treatment side effects and make adjustments as needed.

Tests you might have during initial diagnosis or to monitor disease progression include:

- **MRI (magnetic resonance imaging)** is a noninvasive procedure that uses a magnetic field and radio waves to create detailed images of the brain and spine. It helps doctors find active lesions or scars from old lesions

- **Blood tests**
 - check for vitamin deficiencies, infections and markers of other autoimmune and inflammatory diseases that cause similar symptoms
 - screen for evidence of increased MS activity
 - monitor side effects from medicine
- **Lumbar puncture (spinal tap)** looks for specific signs of MS in the spinal fluid
- **Evoked potential tests** measure the speed at which the brain tracks electrical signals in response to light, sound or touch stimuli
- **Optical coherence tomography (OCT)** is an instrument that allows doctors to see if the retina has thinned, a common indicator of MS
- **Urinary tests, such as a bladder ultrasound**, pinpoint bladder control issues and are the best approach for managing symptoms
- **Neuropsychological tests** check for early diagnosis of thinking or emotional problems



What causes MS?

You did not cause your MS.

The exact reason the disease develops is unknown, but most experts believe that MS is an autoimmune disease that may be triggered by certain environmental or genetic factors. Research continues to search for definitive answers.

- We do know that MS is more common in those who live in colder regions, farther from the equator the first 15 years of their life.
- Although MS can occur in any race or ethnicity, people with Western European ancestry are more likely to get MS.
- Exposure to the Epstein-Barr virus as an adult, which causes mononucleosis or “mono,” may increase risk of MS.
- MS relapses are more likely to occur during an upper respiratory tract infection.
- Having a chronically low level of vitamin D may increase the chance of developing MS.
- Cigarette smoking is associated with a more severe course of MS.
- About 15% of people with MS also have a relative with MS. If you have a first-degree relative (mother, father, sibling, child) with MS, your lifetime risk of developing MS is 2-4%, which is seven to 10 times higher than the general population’s risk of developing MS.
- It’s been discovered that more than 230 genes slightly increase the risk of developing MS. No individual gene has been directly identified to cause MS itself, and it’s more likely that a combination of these MS-associated genes leads to disease development.



BREAKTHROUGH RESEARCH

Part of The Ohio State University Wexner Medical Center — one of the largest academic health centers in the nation — the Multiple Sclerosis Center has a very active research program, exploring MS disease progression and promising new therapies. Our scientists are internationally recognized.

We provide patients the opportunity to participate in clinical trials and research. While not right for every individual, these limited studies grant early access to treatments that may lead to significant improvements in your MS. It’s also a rewarding way to help change the future of health care and improve the lives of other patients with multiple sclerosis as well.

To see if you’re a good candidate for a study, visit wexnermedical.osu.edu/participate-in-research.





LIVING WITH MS

A definitive MS diagnosis or the possibility of disease development can be unnerving. It certainly wasn't in the plan you had for your life.


But the experts at Ohio State's Multiple Sclerosis Center are here to help you adapt and integrate a treatment plan into your life, with a focus on minimizing symptoms and slowing down or stopping the disease from getting worse.

Gaining the upper hand

While MS can't be cured, it can be managed. Your specific treatment will depend on the type of MS you have, whether it's active or in remission, and the types of symptoms you're experiencing. Your personalized care plan may include medicine, physical therapy, speech therapy or other at-home treatments.

Disease-modifying drugs make it less likely that a patient will have a future MS attack or develop new lesions. In some cases, disease-modifying drugs have also been shown to slow progressive MS symptoms.

Your care will be adjusted to match your challenges. In addition to visits with your Neurology team, you may also have appointments with different medical experts — all with specialized MS experience — to help you manage specific symptoms, such as a urologist for bladder problems or an ophthalmologist for vision issues.



Think of MS as an interruption, not as an end to your current activities and plans

With effective treatment, you can likely continue to meet your responsibilities. There's not necessarily a need to stop doing what you love.

• Play sports

Several studies reveal the benefit of playing sports for patients with MS to increase balance, reduce fatigue and improve mobility and overall quality of life. Your doctor can provide guidelines for safe activity levels and a list of appropriate sports.

• Continue working

Physical adjustments to your work space, memory tips and other helpful habits can be quite useful for adapting your job to MS.

If you do require either short- or long-term disability, your physician can provide the documentation necessary to gain qualification.

• Begin or grow your family

There's no evidence that MS affects fertility in either men or women.

For women specifically:

- If you're of child-bearing age and on a disease-modifying therapy, you'll probably be advised to take some form of birth control. Once you decide you want to try to become pregnant, your doctor can help you plan for a safe pregnancy and delivery.
- MS disease progression is unlikely to be impacted by pregnancy or breastfeeding.
- Studies show women with MS have no greater risk of pregnancy complications than those without.

- Of positive benefit, there are typically fewer MS relapses during pregnancy.
- Your doctor can also help you adjust your MS medicines as necessary if you choose to breastfeed your baby.

Lifestyle changes that can impact MS

Simple habit changes can modify your MS.

- Stop smoking — studies show that tobacco use can worsen MS.
- Continue or start exercising — it can minimize symptoms, improve how you feel and potentially slow neurological decline.
- Improve your diet
 - Eat a well-balanced diet, with lots of fruits and vegetables.
 - Omega-3 fatty acids, which are rich in fatty fish (salmon, mackerel and herring), may prove beneficial — and certainly won't hurt.
 - There is evidence that low vitamin D levels are associated with an increased risk of developing MS and a worse clinical course. Therefore, taking a vitamin D3 supplement is often recommended.



HELPFUL RESOURCES

[Ohio State Multiple Sclerosis Center](#)

[Ohio State Neurological Institute](#)

[Ohio State Department of Neurology](#)

[Multiple Sclerosis Association of America](#)

[National Multiple Sclerosis Society](#)

OHIO STATE MULTIPLE SCLEROSIS TEAM OF EXPERTS

Ohio State brings together a multidisciplinary team of nationally and internationally recognized MS specialists to treat every aspect of this chronic condition, including those in:

- Neurology
- Urology
- Ophthalmology
- Neuro-Psychology
- Neuro-Radiology
- Pharmacy
- Infusion
- Nutrition
- Sleep Medicine
- Psychiatry
- Physical Therapy
- Speech Therapy
- Social Work
- MS Physical Rehabilitation

Our experts will tailor a treatment program for your particular type of MS to help you minimize the impact of whichever challenges you face at any point of disease progression.

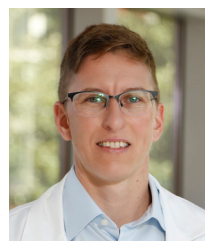
Meet our MS experts



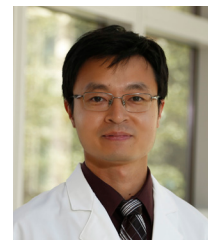
Benjamin Segal, MD;
MS program director,
neurologist



Tirisham Gyang, MD;
neurologist



**Emily Harrington, MD,
PhD;** neurologist



Yinan Zhang, MD;
neurologist



**Kasturi Ganesh Barki,
MBBS;** clinical research
manager



Iryna Crescenze, MD;
urologist



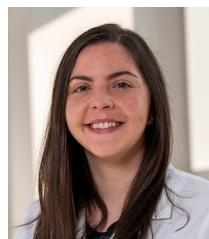
Erica Dawson, PhD;
neuro-psychologist



Kristi Epstein, APRN-CNP, CCRN;
nurse practitioner



**Margaret Hansen,
PharmD;** pharmacist



Abigail Huff, DO;
psychiatrist



Vicki Kascsak, RN;
MS nurse



Meena Khan, MD;
sleep medicine neurologist



Stephanie Kielb, PhD;
clinical neuropsychologist



Trittnee Robinson, MCR;
clinical research coordinator



Grace Schaffner, DPT, PT;
physical therapist



Erica Wright, MSW, LISW-S;
social worker





REQUEST AN APPOINTMENT

Ohio State's Multiple Sclerosis Center can confirm your diagnosis or refine treatment for patients already diagnosed with MS. No physician referral is required, and you can expect quick confirmation of an appointment date.

To schedule, visit wexnermedical.osu.edu/brain-spine-neuro/multiple-sclerosis or call 614-482-2076.

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER MULTIPLE SCLEROSIS CENTER

Brain and Spine Hospital
300 W. 10th Ave.
Columbus, OH 43210

We also have seven additional treatment sites in convenient locations across central Ohio.



ABOUT THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

The Ohio State University Wexner Medical Center is central Ohio's only academic health center, at the forefront of medicine, where discovery and innovation in research laboratories make unique, effective therapies available to patients months and even years before other hospitals. We're proud that *U.S. News & World Report* has consistently ranked Ohio State the best hospital in Columbus, and we've spent 29 consecutive years on the *U.S. News* "Best Hospitals" list. Ten of our specialties — including Neurology and Neurosurgery — have been named to the 2021-2022 list.



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER