THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

DEPARTMENT OF NEUROLOGY

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Advances in multiple sclerosis care and research 2021

New MS research and findings at Ohio State

> *I'm gratified by the success we've made in MS treatment and look forward to future advances that build on that success.*
>
> **- Benjamin Segal, MD**

COVID-19 and multiple sclerosis: How does COVID-19 affect people with MS? It's a question neurologists have been wondering during the pandemic — and data from around the world is providing some possible answers.

In September 2020, Benjamin Segal, MD, chair of the Department of Neurology and director of the Neurological Research Institute at The Ohio State University College of Medicine, chaired a symposium on MS and COVID-19 at MSVirtual2020, the largest international meeting of MS treatment and research experts. During the symposium, physicians and scientists presented data from MS registries located all over the world.

Their findings? In general, it doesn't appear that people with MS are more likely to contract COVID-19 than the general population — but patients with more severe neurological disability and those treated with anti-CD20 antibodies may be at greater risk for poor outcomes from COVID-19 infection.

Beyond those patients, those with MS seem to have the same risk factors for poor COVID-19 outcomes as the general population — factors such as smoking, being older or having underlying medical conditions such as chronic lung or kidney disease, obesity, type 2 diabetes and sickle cell disease.

Patients with MS have also wondered whether the COVID-19 vaccine is as effective in them as in the general population, particularly if they're taking a DMT that lowers immune responses. While we don't know that answer just yet, The Ohio State University Wexner Medical Center is conducting a clinical

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The importance of specialized, personal care

The last 30 years have produced dramatic progress in the treatment of relapsing multiple sclerosis (MS). In that time, the U.S. Food and Drug Administration (FDA) has approved more than 15 drugs that suppress MS attacks or relapses, some by as much as 80%.

These drugs are commonly called disease-modifying therapies, or DMTs, because they alter the clinical course of MS. Thanks to DMTs, the prognosis for people newly diagnosed with relapsing MS is much more favorable than it was three decades ago.

But key to successful MS treatment is tailoring it to the individual. MS is different for each person. Neurological symptoms can vary, as can their frequency and degree of severity — some people with MS will recover more quickly or more completely from MS attacks. Above all, each patient has their own goals, lifestyles and sensitivities to the side effects of MS medications.

At The Ohio State University Wexner Medical Center, we treat each patient with great attention to individual needs, tolerances and desired outcomes.

It starts with the diagnosis: A timely and correct diagnosis of MS is critical to begin DMTs as early as possible and decrease the chance of permanent neurological damage and chronic disability.

Increasing evidence suggests that people with MS symptoms have significantly better long-term outcomes when they visit specialized MS centers, such as the Multiple Sclerosis Center at the Ohio State Wexner Medical Center. The skilled MS experts at these centers can counter the problems of delayed diagnosis and "over diagnosis" that studies show can happen when patients are managed or diagnosed by non-specialists.

A pharmacist's expertise: At Ohio State Wexner Medical Center, a highly trained pharmacist plays a key role in a patient's decision to start, change or consider MS disease-modifying therapies. The Ohio State Wexner Medical Center's Margaret Hansen, PharmD, works with MS physicians and meets individually with patients to review the clinical trial data and possible side effects of all available DMTs. Hansen takes into account a patient's medical history, medical conditions, current medications and allergies. She also arranges for all the necessary testing that must be completed before starting a DMT, schedules vaccinations that lower the risk of certain infections while taking DMTs and monitors patients on DMTs for side effects.

Our team approach: To further optimize care, MS physicians, fellows and

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study to measure anti-COVID-19 immune responses in DMT-treated and untreated MS patients who've been given the vaccine, or who are scheduled to get the vaccine. This study is unique to the Ohio State Wexner Medical Center, which is specifically measuring immune responses that neutralize or inactivate the virus using a sophisticated test developed here.

New MS research at Ohio State: The Ohio State University Wexner Medical Center, one of the country's first academic health centers to combine several neuroscience-related specialties into one program, continues to break ground in its research of the treatment and understanding of multiple sclerosis.

Among the new investigations is work aimed at discovering more effective treatments for people with progressive forms of MS who don't respond to currently available DMTs. The Ohio State Wexner Medical Center is initiating a clinical trial in progressive MS of a new treatment, called a Bruton's tyrosine kinase inhibitor (BTKi), that penetrates the brain and spinal cord. This BTKi targets and disarms the type of inflammatory cells that are believed to cause damage in progressive MS.

In another study, Ohio State Wexner Medical Center researchers are investigating ways to redirect the immune response in the nervous system during MS so that it no longer causes damaged but actually triggers healing — that is, stimulates the regrowth of damaged nerve fibers and repair of the damage myelin sheath — in the optic nerves, brain and spinal cord.

Investigators at the Ohio State Wexner Medical Center have discovered a unique white blood cell in mice that rescues injured nerves from death and stimulates nerve fiber regeneration, and they're trying to identify a similar white blood cell in humans that can be used to restore lost neurological functions.

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The importance of specialized, personal care

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neuroradiologists meet regularly as a team at the Ohio State Wexner Medical Center to present difficult-to-diagnose cases, discuss DMT options for complex patients and review the latest MS therapies that are being tested in clinical trials or recently received FDA approval. This collaborative approach allows the team to consider diverse opinions in developing diagnostic approaches and management strategies for individual patients.

An understanding of individual symptoms: The symptoms of MS can vary widely. MS plaques — patches of damage where nerve cells have lost their protective covering, called myelin — can form anywhere in the central nervous system. Plaques in the optic nerve can cause vision loss and dull colors. In the brainstem, they can cause double vision, facial numbness or weakness and vertigo. In the spinal cord, they can cause arm or leg weakness, tingling, numbness or stiffness and bladder dysfunction.

The location of a new plaque determines its symptoms — both immediately and chronically if a patient doesn't recover completely from the attack. Fatigue is the most common symptom of MS, but it doesn't correlate to plaque load or location. Some people with MS have difficulty with short-term memory, word-finding or multitasking. Some have burning pains and cramps. When core body temperature rises as a result of a fever or exertion on a hot day, latent MS symptoms can temporarily emerge and persistent MS symptoms often worsen.

Each patient has a different history, and each may have experienced some or all of these symptoms to different degrees at different times in the evolution of their disease.

A plan to address these symptoms: Due to the complexity and diversity of MS, we've started an MS Quality of Life Clinic at the Ohio State Wexner Medical Center, dedicated to a thorough appraisal of each individual patient's symptoms and the challenges they impose.

We develop a comprehensive and multidisciplinary treatment plan to address each symptom. This plan often involves referrals to a team of collaborating providers, each of whom has an interest in the care of patients with MS and advanced training in their respective fields. The team includes physical therapists, speech therapists, fatigue and sleep disorders specialists, neuropsychologists, psychiatrists, pain experts and urologists.

Many of these experts will evaluate and manage patients on the same day during a MS Multidisciplinary Symptoms Management Clinic. We may order advanced testing, such as a neuropsychology battery to provide a detailed assessment of cognitive strengths and weaknesses, urodynamic testing to better diagnose bladder issues and tests to evaluate how MS has impacted the visual system.

Specially trained neuropsychologists might initiate cognitive rehabilitation therapy, which involves teaching stress-reducing exercises as well as coping mechanisms to help patients overcome challenges with memory, concentration and fatigue. Physical therapists devise a personalized exercise regimen, which may involve water-based therapy, strengthening and stretching exercises and gait and balance training.

Mark your calendar for our next MS Education Event on Thursday, Aug. 12, at 6-7:30p.m. via Zoom. Registration and details are available at **wexnermedical.osu.edu/mscommunity**.

Visit **wexnermedical.osu.edu/mscommunity** for information, resources and the latest updates on how we can care for you and your family through your journey in MS.