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MULTIPLE SCLEROSIS  
ASSOCIATION OF AMERICA

Improving Lives Today!®

Summer/Fall 2019

# THE Motivator

Published by the Multiple Sclerosis Association of America

## Pediatric MS

- Disease Course
- Diagnosis
- Treatment Options
- Overall Wellness





For people with *multiple sclerosis* (MS)

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By Tom Garry

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# MSAA

MULTIPLE SCLEROSIS  
ASSOCIATION OF AMERICA

Improving Lives Today!®

The Multiple Sclerosis Association of America is a leading resource for the entire MS community, improving lives today through vital services and support.



MSAA strives to provide useful, up-to-date information on matters of concern to MS patients and their families. This material is intended for general informational purposes only, and it does not constitute medical advice. You should not use the information presented as a means of diagnosis or for determining treatment. For diagnosis and treatment options, you are urged to consult your physician.

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# Strategic Planning and Continued Development

**By Gina Ross Murdoch**  
MSAA President and CEO

With the arrival of autumn, I am reminded of how quickly the seasons pass by with so much activity going on at MSAA. This activity includes the many past achievements that were reached during our 2018-2019 fiscal year... current directions such as strategic planning, continued development of existing programs and new initiatives, plus the recent addition of new professionals joining MSAA... and future activity as we approach our 50th year of dedicated service to the MS community.

Before I expand upon some of these exciting topics just mentioned, I do want to comment on our very important cover story topic for this issue of *The Motivator*. The term “pediatric MS” refers to any young person under the age of 18 who is diagnosed with the disease. At one time, children in this age group – particularly preteens and younger children – were thought to be too young to develop MS.

However, researchers and physicians alike are now all too aware that MS can occur even in very young children and needs to be among the suspected illnesses when a child presents with MS-like symptoms.

The good news is that the medical community has gained a great deal of information on pediatric MS, including how children are affected differently than adults, what treatments are proving to be the most effective in this age group, and how parents and other adult figures in these young people’s lives may help them to thrive despite the challenges posed by MS. I hope that this article will shed light on the many factors involved and help the MS community to come together in support of this growing population.

Moving on to our last fiscal year, which concluded in June, we were able to achieve many urgent goals in serving the MS community. Among them, we launched two new educational initiatives, which included our inaugural podcasts, plus our “What’s New in

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Gina Ross Murdoch is a seasoned executive in non-profit management. Her career includes leadership positions with chapters of the Leukemia and Lymphoma Society as well as the American Diabetes Association. Earlier, she spent 14 years overseeing development activities at a large chapter of the National Multiple Sclerosis Society, leading explosive growth initiatives and ground-breaking strategic projects. An active member of the community, Ms. Murdoch has held several town positions and volunteers for her college alma mater, Drew University.

MS Research” online, bimonthly articles. In addition, MSAA received several distinguished awards for our educational materials. For information on our current educational materials and programs, please see Program Notes on pages 34 and 38.

Before introducing our new professionals who have joined MSAA, I must first announce the retirement of a long-time medical advisor and supporter for MSAA. Dr. Jack Burks, who has worked with us for decades, has officially retired from his work at MSAA as chief medical consultant. While we will miss him greatly, we wish him much enjoyment in his personal pursuits. On behalf of MSAA, I would like to thank Dr. Burks for his decades of service to the MS community, providing expert perspectives, guidance, and support for our mission. For more details on our farewell to Dr. Burks, please see page 31.

I am very proud to announce a new chief medical officer (CMO) for the organization. Barry A. Hendin, MD, a highly accomplished neurologist who specializes in MS, has assumed the role. Dr. Hendin currently practices medicine at Phoenix Neurological Associates, Ltd., where he has been a neurologist for the past 45 years. He also holds the position of director of the Multiple Sclerosis Clinic at Banner University Medical Center and is a clinical professor of neurology at the University of Arizona Medical School. Prior to Dr. Hendin’s appointment as CMO, he presented at several of MSAA’s patient educational programs.

I am also happy to announce two new additions to our Board of Directors, Audrey

Allsopp and Ann Baird Bishop. Ms. Allsopp is a workers’ compensation practice leader and claims consultant with Conner Strong & Buckelew, an insurance brokerage, employee benefits, and risk management consulting firm. Ann Baird Bishop, Esq. is a workers’ compensation lawyer with Hall Booth Smith PC, a full-service law firm. MSAA welcomes Dr. Hendin, Ms. Allsopp, and Ms. Bishop to our MSAA family!

I would like to conclude this issue’s Up Front column with a special note about the upcoming year. In 2020, MSAA will be recognizing our 50th Anniversary of “Improving Lives Today” for the entire MS community. During this milestone year, we will be looking back on the impact MSAA has had during its 50 years of service... as well as ahead to how we can improve more lives in the future. Our thanks to all who have been a part of making MSAA the innovative, compassionate, and dynamic organization of today and tomorrow. ■

## Check out MSAA’s **PODCASTS**

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# Pediatric MS

**Disease Course, Diagnosis,  
Treatment Options, and  
Overall Wellness**

**Once considered very rare,  
the number of children  
diagnosed with MS has been  
consistently on the rise.**

**By Tom Garry, Medical Writer**

**Edited by Susan Wells Courtney  
MSAA Senior Writer**

**Reviewed by Barry A. Hendin, MD  
MSAA Chief Medical Officer**

The last few years have seen plenty of welcome news regarding pediatric multiple sclerosis (MS). In 2018, Gilenya® (fingolimod) became the first disease-modifying therapy (DMT) approved by the United States Food and Drug Administration (FDA) for use in children and adolescents. Several other DMTs already approved for use in adults are in late stages of evaluation for pediatric MS. Researchers are investigating a role for stem-cell therapy, and are pursuing new classes of drugs that would restore the nerve-protecting myelin sheath that becomes damaged in MS. Experts report that the average time from onset of symptoms to diagnosis of pediatric MS is declining, which means that the medical community is considering the possibility of an MS diagnosis in young patients at





an earlier time. Clinicians have more knowledge than ever about the course of MS in children and adolescents, risk factors for relapse, how to manage symptoms, and other aspects of medical management.

Mary Karpinski, LMSW, reviews those encouraging developments when she meets with the parents of a young person recently diagnosed with MS, but the most reassuring message she delivers concerns something that can't be seen on magnetic resonance imaging (MRI) or quantified in an annualized relapse rate. "I remind parents that children are incredibly resilient. I explain that I've found young people with MS to be particularly strong, and that they can get through pretty much anything so long as parents give them the building blocks to succeed, and do not let their own worries lead them to impose well-intentioned but overly restrictive limits on what their child can do."

Ms. Karpinski speaks from considerable experience. For the past 13 years she has served as the single point of access for young people with MS receiving care at the Pediatric MS Center of the UBMD Neurology/Jacobs Neurological Institute of the University at Buffalo. "I've been privileged to work with and assist many young people with MS as they've moved from childhood into adulthood. When parents first learn that their child has MS, one of the questions they inevitably ask is, 'What will the future hold?' I tell them about the many young people I've worked with who have earned college degrees, married, built meaningful careers, and had children of their own. Some have faced more challenges than

others, and everyone's path is different, but these children – and their parents – are the most inspiring people I have met," the social worker says.

This cover story examines the progress that has been made in helping these young people deal with MS, developments on the near horizon, the key unanswered questions about pediatric MS, and experts' advice on enhancing the health and quality of life for young people with MS.

### **Latest information about the course of pediatric MS**

Exploring how – and why – pediatric MS is similar to and different from MS in adults has been a major focus of researchers. These investigators are analyzing the commonalities and contrasts for insights into everything from the factors that trigger the onset of MS in young people, to the way therapies approved for use in adults are likely to affect the course of MS in children and adolescents.

While relapsing-remitting MS is by far the most common form of the disease in newly diagnosed adults, it appears to be even more predominant in children and adolescents, representing 93% or more of all pediatric cases.<sup>1</sup> Meanwhile, researchers at Partners Multiple Sclerosis Center in Boston have found that young people have relapses two to three times more often than adults, and that this difference persists over at least the first six years from onset of symptoms.<sup>2,3</sup>

However, there is evidence that young people generally recover from relapses more quickly than adults.<sup>4</sup>

For people with relapsing or primary progressive forms of multiple sclerosis (MS)



**MS**  
shouldn't  
make you  
question  
your plans

#### What is OCREVUS?

OCREVUS is a prescription medicine used to treat adults with relapsing or primary progressive forms of multiple sclerosis.

It is not known if OCREVUS is safe or effective in children.

#### Who should not receive OCREVUS?

**Do not** receive OCREVUS if you have an active hepatitis B virus (HBV) infection.

**Do not** receive OCREVUS if you have had a life threatening allergic reaction to OCREVUS. Tell your healthcare provider if you have had an allergic reaction to OCREVUS or any of its ingredients in the past.

#### What is the most important information I should know about OCREVUS?

**OCREVUS can cause serious side effects, including:**

- **Infusion reactions:** OCREVUS can cause infusion reactions that can be serious and require you to be hospitalized. You will be monitored during your infusion and for at least 1 hour after each infusion of OCREVUS for signs and symptoms of an infusion reaction. Tell your healthcare provider or nurse if you get any symptoms (see accompanying Patient Information).

**These infusion reactions can happen for up to 24 hours after your infusion.** It is important that you call

your healthcare provider right away if you get any of the signs or symptoms listed in the accompanying Patient Information.

If you get infusion reactions, your healthcare provider may need to stop or slow down the rate of your infusion.

#### • Infection:

- OCREVUS increases your risk of getting upper respiratory tract infections, lower respiratory tract infections, skin infections, and herpes infections. Tell your healthcare provider if you have an infection or have any signs of infection (see accompanying Patient Information). These signs can happen during treatment or after you have received your last dose of OCREVUS. If you have an active infection, your healthcare provider should delay your treatment with OCREVUS until your infection is gone.
- **Progressive Multifocal Leukoencephalopathy (PML):** Although no cases have been seen with OCREVUS treatment in clinical trials, PML may happen with OCREVUS. PML is a rare brain infection that usually leads to death or severe disability. Tell your healthcare provider right away if you have any new or worsening neurologic signs or symptoms. These may include problems with thinking, balance, eyesight, weakness





In **relapsing MS**, OCREVUS demonstrated<sup>†</sup>:

- **Reduction** of relapses
- **Slowing** of disability progression
- **Significant impact** on brain lesions

In **primary progressive MS**, OCREVUS is the first and only FDA-approved treatment.

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### TALK TO YOUR DOCTOR TODAY

on 1 side of your body, strength, or using your arms or legs (see accompanying Patient Information).

- o **Hepatitis B virus (HBV) reactivation:** Before starting treatment with OCREVUS, your healthcare provider will do blood tests to check for hepatitis B viral infection. If you have ever had hepatitis B virus infection, the hepatitis B virus may become active again during or after treatment with OCREVUS. Hepatitis B virus becoming active again (called reactivation) may cause serious liver problems including liver failure or death. Your healthcare provider will monitor you if you are at risk for hepatitis B virus reactivation during treatment and after you stop receiving OCREVUS.
- o **Weakened immune system:** OCREVUS taken before or after other medicines that weaken the immune system could increase your risk of getting infections.

**Tell your healthcare provider about all the medicines you take**, including prescription and over-the-counter medicines, vitamins, and herbal supplements.

#### What are the possible side effects of OCREVUS?

**OCREVUS may cause serious side effects, including:**

- **Risk of cancers (malignancies) including breast cancer.** Follow your healthcare provider's instructions about standard screening guidelines for breast cancer.

Most common side effects include infusion reactions and infections.

These are not all the possible side effects of OCREVUS. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

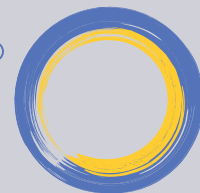
**For additional Important Safety Information, please see the accompanying Patient Information.**

\*First dose of OCREVUS is split—given as 2 separate infusions 2 weeks apart.

†In two 2-year clinical studies vs REBIF.‡

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## PATIENT INFORMATION

OCREVUS® (oak-rev-us)  
(ocrelizumab)  
injection, for intravenous use

### What is the most important information I should know about OCREVUS?

#### OCREVUS can cause serious side effects, including:

- **Infusion reactions:** OCREVUS can cause infusion reactions that can be serious and require you to be hospitalized. You will be monitored during your infusion and for at least 1 hour after each infusion of OCREVUS for signs and symptoms of an infusion reaction. Tell your healthcare provider or nurse if you get any of these symptoms:

- itchy skin
- rash
- hives
- tiredness
- coughing or wheezing
- trouble breathing
- throat irritation or pain
- feeling faint
- fever
- redness on your face (flushing)
- nausea
- headache
- swelling of the throat
- dizziness
- shortness of breath
- fatigue
- fast heart beat

**These infusion reactions can happen for up to 24 hours after your infusion.** It is important that you call your healthcare provider right away if you get any of the signs or symptoms listed above after each infusion.

If you get infusion reactions, your healthcare provider may need to stop or slow down the rate of your infusion.

#### • Infection:

- OCREVUS increases your risk of getting upper respiratory tract infections, lower respiratory tract infections, skin infections, and herpes infections. Tell your healthcare provider if you have an infection or have any of the following signs of infection including fever, chills, a cough that does not go away, or signs of herpes (such as cold sores, shingles, or genital sores). These signs can happen during treatment or after you have received your last dose of OCREVUS. If you have an active infection, your healthcare provider should delay your treatment with OCREVUS until your infection is gone.
- **Progressive Multifocal Leukoencephalopathy (PML):** Although no cases have been seen with OCREVUS treatment in clinical trials, PML may happen with OCREVUS. PML is a rare brain infection that usually leads to death or severe disability. Tell your healthcare provider right away if you have any new or worsening neurologic signs or symptoms. These may include problems with thinking, balance, eyesight, weakness on 1 side of your body, strength, or using your arms or legs.
- **Hepatitis B virus (HBV) reactivation:** Before starting treatment with OCREVUS, your healthcare provider will do blood tests to check for hepatitis B viral infection. If you have ever had hepatitis B virus infection, the hepatitis B virus may become active again during or after treatment with OCREVUS. Hepatitis B virus becoming active again (called reactivation) may cause serious liver problems including liver failure or death. Your healthcare provider will monitor you if you are at risk for hepatitis B virus reactivation during treatment and after you stop receiving OCREVUS.

- **Weakened immune system:** OCREVUS taken before or after other medicines that weaken the immune system could increase your risk of getting infections.

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OCREVUS is a prescription medicine used to treat adults with relapsing or primary progressive forms of multiple sclerosis.

It is not known if OCREVUS is safe or effective in children.

#### Who should not receive OCREVUS?

- **Do not** receive OCREVUS if you have an active hepatitis B virus (HBV) infection.
- **Do not** receive OCREVUS if you have had a life threatening allergic reaction to OCREVUS. Tell your healthcare provider if you have had an allergic reaction to OCREVUS or any of its ingredients in the past. See "**What are the ingredients in OCREVUS?**" for a complete list of ingredients in OCREVUS.

#### Before receiving OCREVUS, tell your healthcare provider about all of your medical conditions, including if you:

- have or think you have an infection. See "**What is the most important information I should know about OCREVUS?**"
  - have ever taken, take, or plan to take medicines that affect your immune system, or other treatments for MS. These medicines could increase your risk of getting an infection.
  - have ever had hepatitis B or are a carrier of the hepatitis B virus.
  - have had a recent vaccination or are scheduled to receive any vaccinations.
    - **You should receive any required 'live' or 'live-attenuated' vaccines at least 4 weeks before you start treatment with OCREVUS.** You should not receive 'live' or 'live-attenuated' vaccines while you are being treated with OCREVUS and until your healthcare provider tells you that your immune system is no longer weakened.
    - **When possible, you should receive any 'non-live' vaccines at least 2 weeks before you start treatment with OCREVUS.** If you would like to receive any non-live (inactivated) vaccines, including the seasonal flu vaccine, while you are being treated with OCREVUS, talk to your healthcare provider.
    - If you are pregnant or planning to become pregnant talk to your doctor about vaccinations for your baby, as some precautions may be needed.
  - are pregnant, think that you might be pregnant, or plan to become pregnant. It is not known if OCREVUS will harm your unborn baby. You should use birth control (contraception) during treatment with OCREVUS and for 6 months after your last infusion of OCREVUS.
  - are breastfeeding or plan to breastfeed. It is not known if OCREVUS passes into your breast milk. Talk to your healthcare provider about the best way to feed your baby if you take OCREVUS.
- Tell your healthcare provider about all the medicines you take,** including prescription and over-the-counter medicines, vitamins, and herbal supplements.
- #### How will I receive OCREVUS?
- OCREVUS is given through a needle placed in your vein (intravenous infusion) in your arm.



- Before treatment with OCREVUS, your healthcare provider will give you a corticosteroid medicine and an antihistamine to help reduce infusion reactions (make them less frequent and less severe). You may also receive other medicines to help reduce infusion reactions. See **“What is the most important information I should know about OCREVUS?”**
- Your first full dose of OCREVUS will be given as 2 separate infusions, 2 weeks apart. Each infusion will last about 2 hours and 30 minutes.
- Your next doses of OCREVUS will be given as one infusion every 6 months. These infusions will last about 3 hours and 30 minutes.

**What are the possible side effects of OCREVUS?**

**OCREVUS may cause serious side effects, including:**

- See **“What is the most important information I should know about OCREVUS?”**
- **Risk of cancers (malignancies) including breast cancer.** Follow your healthcare provider’s instructions about standard screening guidelines for breast cancer.

Most common side effects include infusion reactions and infections. See **“What is the most important information I should know about OCREVUS?”**

These are not all the possible side effects of OCREVUS.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

**General information about the safe and effective use of OCREVUS.**

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use OCREVUS for a condition for which it was not prescribed. Do not give OCREVUS to other people, even if they have the same symptoms that you have. It may harm them. You can ask your pharmacist or healthcare provider for information about OCREVUS that is written for health professionals.

**What are the ingredients in OCREVUS?**

**Active ingredient:** ocrelizumab

**Inactive ingredients:** glacial acetic acid, polysorbate 20, sodium acetate trihydrate, trehalose dihydrate.

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For more information, go to [www.OCREVUS.com](http://www.OCREVUS.com) or call 1-844-627-3887.

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Research suggests that pediatric-onset MS takes longer to diminish physical abilities than does adult-onset MS, and also is slower to develop into secondary-progressive MS. British researchers who examined long-term outcomes in more than 2,000 MS patients found that those who developed the disease before 18 years of age, took on average, 23.8 years to reach an Expanded Disability Status Scale (EDSS) score of 4 (on the scale, 0 represents no disability, while progression toward higher numbers leading up to 10, indicates increasing disability) versus 15.5 years for people who developed MS as adults. Similarly, time to development of secondary-progressive MS was 32 years for pediatric-onset patients and 18 years for adult-onset patients.<sup>5</sup>

Conversely, compared to adult-onset MS, pediatric-onset MS appears to have a greater impact on cognitive function in the years following onset of symptoms.<sup>5,6</sup> Italian investigators who studied 48 pediatric MS patients found that 31% had some degree of cognitive impairment on initial evaluation, and that this proportion increased to 38% over five years.<sup>7,6</sup> Meanwhile, a recent study of more than 5,700 adults with MS found that those who developed the disease as children or adolescents were roughly 1.5-times more likely to have cognitive impairment in adulthood than people whose symptoms began when they already were adults, and that this increased risk was independent of the person's age or duration of MS.<sup>8</sup>

Given these findings, Emmanuelle Waubant, MD, recommends neuropsychological testing

of children and adolescents who are newly diagnosed with MS. "Getting a baseline is very helpful, and can help inform approaches to working with the child's school and other aspects of comprehensive care," explains Dr. Waubant, a professor of neurology at the University of California, San Francisco (UCSF) with extensive clinical and research expertise in pediatric MS. She advises follow-up testing two-to-three years later, unless a concern in the interim warrants earlier re-evaluation.

Ms. Karpinski notes that the testing can help parents identify areas of strength and need – and, as a result – better understand the challenges their child may be facing, set realistic expectations, and advocate effectively for their son or daughter. She adds, however, that it is important for parents to meet with the specialist who evaluated their child to review the test results and their implications. "The reports containing the test results can be difficult to read, both in terms of the technical language employed, and sometimes, in terms of what the evaluation identified. Rather than trying to puzzle that out on their own, parents should sit with the specialist and get the background needed to avoid misunderstandings and put the results in context," she says.

Parents also need to be aware of the heightened presence of anxiety and mood disorders in young people with MS, and to include mental-health professionals in their care team, as needed, Ms. Karpinski adds. A study of 23 young people aged 6 to 17 who had MS or another demyelinating disorder found that 48% met the criteria for a





*A study of 45 young people found that cognitive impairment is more common among pediatric MS patients with mood and anxiety disorders than among those without a psychiatric diagnosis.*

psychiatric diagnosis, with almost one-third having anxiety disorders and about 10% having depression.<sup>9</sup> Another study, this one involving 45 young people, found that cognitive impairment is more common among pediatric MS patients with mood and anxiety disorders than among those without a psychiatric diagnosis. Eighty percent of the study participants who had been diagnosed with an anxiety disorder, a depressive disorder, or attention-deficit hyperactivity disorder (ADHD), had evidence of cognitive impairment. By contrast, 55% of the 20 participants who did not have a psychiatric disorder demonstrated cognitive impairment on testing.<sup>10</sup>

In exploring why the course of pediatric MS often differs from that of adult MS, researchers have noted that disease onset in young people is marked by a higher disease burden and more disease activity on MRI than is seen in adults. In a study of 41 individuals with pediatric-onset MS and 35 individuals who developed MS as adults, Dr. Waubant and colleagues found that the children had a median 21 T2-bright lesions, as opposed to six in adults, and had more

T2-bright areas generally and focal points in enhancing lesions, indicating greater disease activity.<sup>11</sup> Another study involving 19 children and 12 adults with MS found that the pediatric patients had more extensive acute damage to the axons that carry electrical impulses from the central nervous system's main type of cell, the neuron.<sup>12</sup> Those and other findings suggest that pediatric MS is more inflammatory in nature than adult-onset MS.<sup>13</sup>

Meanwhile, another age-related aspect of MS may offer important insights into factors contributing to onset of disease. While less than 1% of all cases of MS develop before age 10 to 12 years, the condition affects boys and girls in that age group in roughly equal proportion. By age 12 and older, however, the female:male ratio in pediatric MS shifts to 2.8:1, a gender split similar to that seen in adult-onset patients.<sup>1</sup> Tanuja Chitnis, MD, a professor of neurology at Harvard Medical School and pediatric MS expert at Massachusetts General Hospital and Brigham and Women's Hospital in Boston, noted in a 2013 article that this shift suggests a role for puberty in MS risk.<sup>14</sup>

## Progress in making a timely diagnosis

E. Ann Yeh, MD, MA, FCRPC, says that just 15 years or so ago, the main challenge in diagnosing pediatric MS wasn't necessarily obtaining an MRI to see what *was happening* in a *child's* brain. Rather, she explains, the bigger issue often was what was *not happening* in a *doctor's* brain.

"Pediatricians, and even child neurologists, just weren't trained to think in terms of children having MS. We were given the impression in residency and fellowship that MS did not occur in children, or that if it did, it was so rare that MS should not be high on the list of possibilities to consider when a young person presented with symptoms that could reflect a demyelinating event," recalls Dr. Yeh. Today, as director of the MS and Demyelinating Disorders Program at The Hospital for Sick Children (SickKids) in Toronto, the physician sees dozens of children with MS from across Ontario and nearby Canadian provinces and American states.

Greater awareness that pediatric MS is a real – albeit quite uncommon – condition has contributed to significant improvements in the timeliness and accuracy of diagnosis, according to Dr. Yeh, who is also a senior associate scientist in Neurosciences & Mental Health at SickKids and a professor of pediatrics (Neurology) at the University of Toronto. Factors such as increased access to MRI and the development of a diagnostic pathway by the International Pediatric MS Study Group (IPMSSG) have been particularly important in this regard, notes Dr. Yeh, who estimates that the average child with MS is

now diagnosed within about six months of symptom onset.

The IPMSSG guidance is intended to help clinicians evaluate young people who present with indications of a possible acquired demyelinating syndrome, meaning symptoms suggesting that the myelin sheath that coats nerves in the central nervous system has been damaged. Such symptoms may include visual loss, double vision, sensations of tingling or numbness, weakness, abnormal or uncoordinated movements, and urinary issues, similar to adults who develop relapsing-remitting MS.<sup>15</sup>

Acquired demyelinating syndromes (ADS) in pediatric patients include acute disseminating encephalomyelitis (ADEM), neuromyelitis optica spectrum disorders (NMOSD), clinically isolated syndromes (CIS), and multiple sclerosis.<sup>16</sup>

Beyond distinguishing between the conditions within that group of disorders, however, pediatric neurologists also need to consider other conditions that may cause the same symptoms seen with demyelinating syndromes.

"The differential diagnosis for pediatric MS is quite broad, and includes a number of 'MS mimics' that are different from those that have to be considered when evaluating potential adult-onset MS," notes Dr. Waubant. To help narrow that differential diagnosis, which essentially is a list of possible causes, the IPMSSG's 2016 evaluation pathway identifies red flags that suggest a child may not have a demyelinating syndrome.<sup>16</sup> The document also recommends a protocol for



employing blood tests, assessment of cerebrospinal fluid (CSF), imaging, and other steps to identify specific demyelinating syndromes, including MS.<sup>16</sup>

The IPMSSG notes that a diagnosis of pediatric MS is warranted when a child or adolescent has two or more episodes presumed to be caused by inflammatory demyelination that do not represent ADEM and that occur more than 30 days apart. The episodes must involve more than one site in the central nervous system. The group also identifies three other, less-common scenarios that justify the diagnosis<sup>16</sup>

However, Dr. Waubant notes that an intriguing, related question remains unanswered. “In the last 10 years or so, we’ve tended to see more patients with pediatric MS than we did previously. Greater awareness of the condition and improved diagnosis clearly

play roles in this, but we just don’t know whether – beyond those factors – there also has been an increase in the actual number of children and adolescents who are developing MS,” she explains.

Dr. Yeh agrees, and notes that as physicians become more skilled at making an early diagnosis, along with greater patient access to magnetic resonance imaging, the proportion of cases of pediatric MS that go unrecognized will be reduced. According to Dr. Yeh, “We should be able to tell what’s happening.” She adds that even accounting for such issues, “the numbers do seem to be going up.” (See “Risk Factors for Pediatric MS Coming into Sharper Focus.”)

Recent study-based estimates of the incidence – or number of new cases per year – of pediatric MS vary from 0.07 to 2.9 per

*continued on page 17*

## Risk Factors for Pediatric MS Coming into Sharper Focus

What factors put children at risk for multiple sclerosis (MS)? While much remains to be determined, research has implicated factors including:

**1. Exposure to smoking.** A study involving 129 children and adolescents with MS and more than 1,000 controls found that children exposed to parental smoking had more than twice the risk of developing MS before age 16 than children not exposed to parental smoking.<sup>1</sup> Other research examining genes also supports a role for secondhand smoke in pediatric MS.<sup>2,3</sup>

**2. Exposure to household chemicals.** A 2018 study by investigators at 16 institutions found that indirect or passive exposure to certain rat and mouse poisons or weed-control agents was associated with a doubling of risk for pediatric-onset MS.<sup>4</sup> Further, exposure to certain products used to control plant and tree disease was associated with a 2.7-fold increased risk for developing MS or clinically isolated syndrome (CIS) as a child. The investigators emphasize that further studies are needed.<sup>4</sup>

**3. Epstein-Barr virus.** Past infection with the Epstein-Barr virus (EBV), which is relatively common, long has been identified as a risk

factor for MS in adults.<sup>5</sup> Recent research has shown a significant association between having blood work indicating a history of EBV infection and pediatric onset of MS.<sup>6,7</sup>

**4. Low vitamin D status.** Blood levels of a form of Vitamin D known as 25-hydroxyvitamin D, or 25(OH)D, typically are lower in both pediatric and adult MS patients than in the overall population.<sup>8</sup> Experts caution that further research is needed to clarify how prenatal, perinatal, and childhood Vitamin D status affects risk for pediatric MS.<sup>9</sup>

**5. Obesity.** Case-control studies have shown an association between obesity and increased risk for MS or CIS, with one study finding increased risk for both boys and girls,<sup>10</sup> and another reporting elevated risk in girls only.<sup>11</sup> Another study examined genetic risk scores and found evidence for a causal relationship between increased body mass index (BMI) and susceptibility to pediatric MS.<sup>12</sup>

**6. Genetics.** Investigators are examining not only specific genes and gene variants, but also the even more-complex topic of how genes interact with one another and with environmental factors.<sup>13, 14</sup>

Researchers are also exploring the potential impact of factors such as place of residence, age at first menstrual period, age at start of daycare, dietary intake, mother's health during pregnancy, and more.<sup>9</sup>

While investigators probe these areas, clinicians urge parents of children who have MS or who may be at increased risk for MS to address those risk factors that can be modified, such as exposure to smoking and

obesity. Although there is not yet strong evidence that these steps will enable a child to avoid MS or modify its course, the benefits in terms of overall well-being are clear. ■

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opens up possibilities

Laura S., living with relapsing MS

## Say yes to TECFIDERA—a pill that can cut MS relapses in half.

TECFIDERA is a twice-daily pill proven to work against relapsing multiple sclerosis (MS) in 3 different ways. It can **cut relapses in half**, **slow the development of brain lesions**, and **delay the progression of physical disability**. In fact, in a 2-year study, people taking TECFIDERA had a 49% lower risk of relapse and were 38% less likely to experience physical disability progression than people taking placebo.



**Are you ready to say yes to fewer relapses? Visit [yestoTEC.com](http://yestoTEC.com) or call 1-844-TalkTec (1-844-825-5832)**

### What is TECFIDERA?

Tecfidera® (dimethyl fumarate) is a prescription medicine used to treat people with relapsing forms of multiple sclerosis.

### Important Safety Information

Do not use TECFIDERA if you have had an allergic reaction (such as welts, hives, swelling of the face, lips, mouth or tongue, or difficulty breathing) to TECFIDERA or any of its ingredients.

Before taking and while you take TECFIDERA, tell your doctor about any low white blood cell counts or infections or any other medical conditions.

### What are the possible side effects of TECFIDERA?

**TECFIDERA may cause serious side effects including:**

- **Allergic reactions**
- **PML, which is a rare brain infection that usually leads to death or severe disability.**
- **Decreases in your white blood cell count.** Your doctor should check your white blood cell count before you take TECFIDERA and from time to time during treatment
- **Liver problems.** Your doctor should do blood tests to check your liver function before you start taking TECFIDERA and during treatment if needed. Tell your doctor right away if you get any symptoms of a liver problem during treatment, including:
  - severe tiredness
  - loss of appetite
  - pain on the right side of your stomach
  - dark or brown (tea color) urine
  - yellowing of your skin or the white part of your eyes

### Important Safety Information (continued)

**The most common side effects of TECFIDERA include flushing and stomach problems.** These can happen especially at the start of treatment and may decrease over time. Taking TECFIDERA with food may help reduce flushing. Call your doctor if these symptoms bother you or do not go away. Ask your doctor if taking aspirin before taking TECFIDERA may reduce flushing.

These are not all the possible side effects of TECFIDERA. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

**For more information go to [daily.med.nlm.nih.gov](http://daily.med.nlm.nih.gov).**

**Tell your doctor** if you are pregnant or plan to become pregnant, or breastfeeding or plan to breastfeed. It is not known if TECFIDERA will harm your unborn baby or if it passes into your breast milk. Also tell your doctor if you are taking prescription or over-the-counter medicines, vitamins, or herbal supplements. If you take too much TECFIDERA, call your doctor or go to the nearest hospital emergency room right away.

**For additional Important Safety Information, please see Patient Information on the following page. This is not intended to replace discussions with your doctor.**

\*Based on number of prescriptions from IMS NPA™ Weekly Data (September 27, 2013 – December 8, 2017).

 **Tecfidera**  
(dimethyl fumarate) delayed-release capsules 240mg





**Patient Information**  
**TECFIDERA®** (tek" fi de' rah)  
**(dimethyl fumarate) delayed-release capsules**

**What is TECFIDERA?**

- TECFIDERA is a prescription medicine used to treat people with relapsing forms of multiple sclerosis (MS)
- It is not known if TECFIDERA is safe and effective in children under 18 years of age

**Who should not take TECFIDERA?**

- Do not use TECFIDERA if you have had an allergic reaction (such as welts, hives, swelling of the face, lips, mouth or tongue, or difficulty breathing) to TECFIDERA or any of its ingredients. See below for a complete list of ingredients.

**Before taking and while you take TECFIDERA, tell your doctor if you have or have had:**

- low white blood cell counts or an infection
- any other medical conditions

**Tell your doctor if you are:**

- pregnant or plan to become pregnant. It is not known if TECFIDERA will harm your unborn baby.
  - If you become pregnant while taking TECFIDERA, talk to your doctor about enrolling in the TECFIDERA Pregnancy Registry. You can enroll in this registry by calling 1-866-810-1462 or visiting [www.tecfiderapregnancyregistry.com](http://www.tecfiderapregnancyregistry.com). The purpose of this registry is to monitor the health of you and your baby.
- breastfeeding or plan to breastfeed. It is not known if TECFIDERA passes into your breast milk. You and your doctor should decide if you will take TECFIDERA or breastfeed.
- taking prescription or over-the-counter medicines, vitamins, or herbal supplements

**How should I take TECFIDERA?**

- Take TECFIDERA exactly as your doctor tells you to take it
- The recommended starting dose is one 120 mg capsule taken by mouth 2 times a day for 7 days
- The recommended dose after 7 days is one 240 mg capsule taken by mouth 2 times a day
- TECFIDERA can be taken with or without food
- Swallow TECFIDERA whole. Do not crush, chew, or sprinkle capsule contents on food.
- Protect TECFIDERA from light. You can do this by storing the capsules in their original container.
- If you take too much TECFIDERA, call your doctor or go to the nearest hospital emergency room right away.

**What are the possible side effects of TECFIDERA?**

**TECFIDERA may cause serious side effects including:**

- **allergic reaction** (such as welts, hives, swelling of the face, lips, mouth or tongue, or difficulty breathing)
- **PML** a rare brain infection that usually leads to death or severe disability
- **decreases in your white blood cell count** Your doctor should do a blood test before you start treatment with TECFIDERA and while on therapy.
- **liver problems.** Your doctor should do blood tests to check your liver function before you start taking TECFIDERA and during treatment if needed. Tell your doctor right away if you get any of these symptoms of a liver problem during treatment.
  - severe tiredness
  - loss of appetite
  - pain on the right side of your stomach
  - have dark or brown (tea color) urine
  - yellowing of your skin or the white part of your eyes

**The most common side effects of TECFIDERA include:**

- flushing, redness, itching, or rash
- nausea, vomiting, diarrhea, stomach pain, or indigestion
- Flushing and stomach problems are the most common reactions, especially at the start of therapy, and may decrease over time. Taking TECFIDERA with food may help reduce flushing. Call your doctor if you have any of these symptoms and they bother you or do not go away. Ask your doctor if taking aspirin before taking TECFIDERA may reduce flushing.

These are not all the possible side effects of TECFIDERA. Call your doctor for medical advice about side effects.

You may report side effects to FDA at 1-800-FDA-1088. **For more information go to [dailymed.nlm.nih.gov](http://dailymed.nlm.nih.gov).**

**General Information about the safe and effective use of TECFIDERA**

- Medicines are sometimes prescribed for purposes other than those listed in this Patient Information. Do not use TECFIDERA for a condition for which it was not prescribed. Do not give TECFIDERA to other people, even if they have the same symptoms that you have. It may harm them.
- If you would like more information, talk to your doctor or pharmacist. You can ask your doctor or pharmacist for information about TECFIDERA that is written for healthcare professionals.

**What are the ingredients in TECFIDERA?**

**Active ingredient:** dimethyl fumarate

**Inactive ingredients:** microcrystalline cellulose, silicified microcrystalline cellulose, croscarmellose sodium, talc, silica colloidal silicon dioxide, magnesium stearate, triethyl citrate, methacrylic acid copolymer - Type A, methacrylic acid copolymer dispersion, simethicone (30% emulsion), sodium lauryl sulphate, and polysorbate 80.

**Capsule Shell:** gelatin, titanium dioxide, FD&C blue 1; brilliant blue FCF, yellow iron oxide and black iron oxide.

Manufactured by: Biogen Inc., Cambridge, MA 02142, [www.TECFIDERA.com](http://www.TECFIDERA.com) or call 1-800-456-2255

This Patient Information has been approved by the U.S. Food and Drug Administration. Revised: 1/2017



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100,000 children.<sup>15</sup> Even the higher figure in that range represents an extremely small percentage of young people, however, and it is estimated that there are fewer than 5,000 pediatric MS patients in the United States.<sup>17</sup>

### **More treatment options and more patients receiving treatment**

The FDA has approved 17 DMTs for use in adults with MS. Eight, including the longest-approved agents, are administered by injection, while five are taken orally, and four are infused intravenously. Only one of those medications, the oral-agent Gilenya® (fingolimod), is also approved for use in children and adolescents aged 10 years and older. The FDA expanded Gilenya's indication to include pediatric MS patients in May 2018.<sup>18</sup>

Even before that approval, many pediatric MS specialists prescribed DMTs for their patients in an attempt to prevent relapses and disease progression. However, they often proceeded hesitantly because of a lack of data on the agents' optimal dosing and safety profile in children and adolescents.

Recent years have seen that hesitancy yields to a more pro-active approach, according to Dr. Waubant. "There has been a trend over time to treat pediatric MS more aggressively," she notes, explaining that several factors are propelling the trend. One, she notes, is growing evidence that early intervention in the MS-disease process can favorably impact not only a patient's current health, but also long-term well-being. At the

same time, clinical trials, observational studies, and patient registries are providing reassuring data about the safety profiles of DMTs in children and adolescents.

Expanded options, particularly in terms of route of administration, also has helped. "Teenagers very often are reluctant to consider agents that require an injection, but are willing to take an oral agent," the pediatric MS expert notes. The fact that one agent has been approved by the FDA for use in children and adolescents, and that other DMTs approved for adults are in late stages in clinical evaluation in pediatric populations, has also made both parents and payers (insurance companies) more receptive to DMTs for young patients, Dr. Waubant adds.

Gilenya secured its pediatric indication on the basis of the Phase III PARADIGMS trial, which studied more than 200 young people with pediatric MS.<sup>19</sup> Other pediatric studies of DMTs already approved for use in adults include ongoing Phase III trials of Aubagio® (teriflunomide) and Tecfidera® (dimethyl fumaric acid), an ongoing open-label trial of Lemtrada® (alemtuzumab), and completed open-label trials of Tysabri® (natalizumab) and Tecfidera.<sup>17</sup>

However, Dr. Waubant and several of her colleagues belonging to the IPMSSG note that enrollment challenges and other obstacles mean that "Phase III trials for every newly approved therapy for adult MS in the pediatric MS population are simply not feasible." Writing in the journal *Neurology* earlier this year, they noted, "In the last years, convincing evidence has emerged that the biological

processes involved in MS are largely shared across the age span. As such, treatments proven efficacious for the care of adults with MS have a biological rationale for use in pediatric MS given the relapsing-remitting course at onset and high relapse frequency. There are also ethical considerations on conducting clinical trials in this age group including the use of placebo owing to highly active disease. It is imperative to reconsider study design and implementation based on what information is needed.” The group went on to propose recommendations that would enable future studies to adequately assess the safety of DMT use in pediatric patients while avoiding some of the trial-design issues that made it difficult to obtain timely, meaningful results.<sup>17</sup> (See sidebar on Clinical Trials on page 26.)

Such studies are all the more important given the above-referenced trend toward the increased use of DMTs in children and adolescents. An analysis of 748 pediatric MS patients receiving care at practices in the US Network of Pediatric MS Centers found that 78% had received a DMT before reaching 18 years of age.<sup>20</sup> However, there are indications that the more-proactive approach being taken by clinicians at pediatric MS centers is not being uniformly adopted nationwide. An analysis of claims data for 288 children and adolescents diagnosed with pediatric MS from 2010 to 2017 found that 65% did not receive a DMT in the 12 months following their diagnosis.<sup>21</sup>

Other research into treatment of pediatric MS is looking beyond DMTs. Several small

studies have evaluated the safety and efficacy of Rituxan® (rituximab) in pediatric MS. This monoclonal antibody, which depletes certain types of B cells, primarily is used in the treatment of leukemias and lymphomas. It is not approved for use in either adult or pediatric MS, but has been employed by some clinicians to treat multiple sclerosis.


Investigators are also exploring the role that stem-cell therapy may play in treating pediatric MS, and are pursuing other treatments that would have remyelinating and neuroprotective effects. “One of the greatest unmet needs in pediatric MS relates to the fact that we don’t have a sufficient understanding of why there is disease progression even with adequate control of inflammation. Figuring out a way to control that progression is super important,” says Dr. Yeh. She adds that agents with mechanisms of action different from those of current DMTs will likely be needed to halt the disease progression not driven by inflammation and, hopefully, to exercise a regenerative effect.

### **Promoting wellness for the whole person as well as for family members**

“Yes, MS is a part of your life, but it needn’t define your life,” Ms. Karpinski tells the young people she works with at UBMD Neurology in Buffalo. Often, she adds, parents need to hear that message more than their children do, given a parent’s increased concerns.

The concerns that parents have for a child newly diagnosed with MS are often accompanied by a tendency to be over-





***The concerns that parents have for a child newly diagnosed with MS are often accompanied by a tendency to be over-protective, and even to feel a sense of guilt, experts say.***

protective, and even to feel a sense of guilt, experts say. “Parents often ask, ‘Did I do something that put my child at risk for this?’” notes Dr. Yeh. Beyond allaying parents’ unfounded fears that they are responsible for their child’s MS, she uses the question to refocus parents on ways to optimize their daughter’s or son’s health. The pediatric neurologist explains that those steps include participating in physical activity, ensuring sufficient sleep, and eating a balanced diet while avoiding extreme eating plans not supported by scientific evidence. “I particularly stress the importance of the child staying active and leading a normal life. If parents unnecessarily limit a child’s activities because of concerns about their MS, it can have a negative impact in terms of forging friendships and developing socially,” she adds.

Dr. Waubant counsels parents along the same lines, and notes the importance of having a smoke-free household, and also recommends Vitamin D supplementation. In many cases, she adds, the parents’ concerns about MS extend to their newly diagnosed child’s siblings. When asked about the

chances that another of their children will also develop MS, Dr. Waubant explains to parents that people who have a first-degree relative with MS have a 2% to 3% lifetime chance of having MS.

“Where is my child going to be 10 years from now?” is another question Dr. Waubant hears frequently. “I explain that children with MS are less likely to have problems with physical disability than adults and, for reasons we don’t entirely understand, children are better able to recover from relapses,” the neurologist says. She also urges parents to connect with support networks for families affected by MS. (See “Support and Resources for Families Facing Pediatric MS” on page 21.)

Ms. Karpinski agrees that these support groups and networks are valuable resources for parents, and can help them obtain insights into handling practical issues. One example is to work with school officials to accommodate their child’s educational needs.

“School districts often have many children with a diagnosis of ADHD or seizure disorder, and so they have experience with formulating

educational plans centered around those conditions. But it is not unusual for a child at our clinic to be the only student in his or her district with multiple sclerosis, and educators may not appreciate the need for certain accommodations, such as extended time for test-taking or standing permission to use the restroom,” says Ms. Karpinski.

After more than a decade of working with children at UBMD, Ms. Karpinski has helped several patients make the adjustment from grammar school to high school, and then to college. Along the way, she has addressed

issues ranging from compliance with medication regimens to what and how a teen with MS may want to tell classmates, or a boyfriend or girlfriend, about the condition. She also has worked with patients and parents on family dynamics and practical approaches to dealing with symptoms such as fatigue and heat sensitivity. The experience, she says, has left her in awe of children with MS. “It is a privilege to work with them, and to see them flourish. They’re just amazing people, and they give me so much hope.” ■



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## Support and Resources for Families Facing Pediatric MS

Learning that your child has a serious, lifelong condition can be overwhelming. When that condition is so uncommon that you do not know of anyone else in the same situation, a sense of isolation can add to a parent's anxiety. Resources including the Multiple Sclerosis Association of America (MSAA) are available to assist. Parents may call MSAA's toll-free Helpline at **(800) 532-7667, extension 154**, to speak to an MSAA specialist. Parents and others also can obtain information from MSAA's Helpline by emailing **MSquestions@mymxaa.org**, and by using the online MS Chat feature on MSAA's website at **mymxaa.org/chat**. MSAA's website also has numerous other resources of interest to people of all ages who are coping with the challenges of MS.

Other MS advocacy organizations also offer resources and support for young people with MS and their relatives. One group – the Pediatric Multiple Sclerosis Alliance – is dedicated exclusively to connecting, supporting, and advocating for children and adolescents with MS and their families. The Alliance's website, at **pediatricms.org**, includes a directory of centers specializing in pediatric MS, a resource center where visitors can download parents' guides to understanding the condition, information about camps for young people with MS, and more. This organization also helps the parents of children with MS connect with one another online. ■

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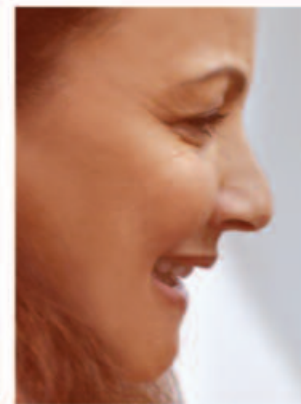
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# Slowing down active SPMS



For adults.  
Not an actual patient.

## What is MAYZENT® (siponimod) tablets?

MAYZENT is a prescription medicine that is used to treat relapsing forms of multiple sclerosis, to include clinically isolated syndrome, relapsing-remitting disease, and active secondary progressive disease, in adults. It is not known if MAYZENT is safe and effective in children.

## IMPORTANT SAFETY INFORMATION

### Do not take MAYZENT if you:

- have a CYP2C9\*3/\*3 genotype. Before starting treatment with MAYZENT, your CYP2C9 genotype should be determined by your health care provider. Ask your health care provider if you are not sure.
- have had a heart attack, chest pain called unstable angina, stroke or mini-stroke (transient ischemic attack or TIA), or certain types of heart failure in the last 6 months
- have certain types of heart block or irregular or abnormal heartbeat (arrhythmia), unless you have a pacemaker

### MAYZENT may cause serious side effects, including:

**1. Slow heart rate (bradycardia or bradyarrhythmia) when you start taking MAYZENT.** MAYZENT can cause your heart rate to slow down, especially after you take your first dose. You should have a test to check the electrical activity of your heart called an electrocardiogram (ECG) before you take your first dose of MAYZENT.

During the initial up dosing period (4 days for the 1-mg daily dose or 5 days for the 2-mg daily dose), if you miss 1 or more doses of MAYZENT, you need to restart the up dosing. Call your health care provider if you miss a dose of MAYZENT.

**2. Infections.** MAYZENT can increase your risk of serious infections that can be life-threatening and cause death. MAYZENT lowers the number of white blood cells (lymphocytes) in your blood. This will usually go back to normal within 3 to 4 weeks of stopping treatment. Your health care provider should review a recent blood test of your white blood cells before you start taking MAYZENT.

Call your health care provider right away if you have any of these

symptoms of an infection during treatment with MAYZENT and for 3 to 4 weeks after you last dose of MAYZENT:

- fever
- tiredness
- body aches
- chills
- nausea
- vomiting
- headache with fever, neck stiffness, sensitivity to light, nausea, confusion (these may be symptoms of meningitis, an infection of the lining around your brain and spine)

**3. A problem with your vision called macular edema.** Macular edema can cause some of the same vision symptoms as a multiple sclerosis (MS) attack (optic neuritis). You may not notice any symptoms with macular edema. If macular edema happens, it usually starts in the first 1 to 4 months after you start taking MAYZENT. Your health care provider should test your vision before you start taking MAYZENT and any time you notice vision changes during treatment with MAYZENT. Your risk of macular edema is higher if you have diabetes or have had an inflammation of your eye called uveitis.

Call your health care provider right away if you have any of the following: blurriness or shadows in the center of your vision, a blind spot in the center of your vision, sensitivity to light, or unusually colored (tinted) vision.

**Before taking MAYZENT, tell your health care provider about all of your medical conditions, including if you:**

- have an irregular or abnormal heartbeat
- have a history of stroke or other diseases related to blood vessels in the brain
- have breathing problems, including during your sleep
- have a fever or infection, or you are unable to fight infections due to a disease or are taking medicines that lower your immune system. Tell your health care provider if you have had chickenpox or have received the vaccine for chickenpox. Your health care provider may do a blood test for chickenpox virus. You may need to get the full course of vaccine for chickenpox and then wait 1 month before you start taking MAYZENT.
- have slow heart rate
- have liver problems





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holding on to  
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Talk to your doctor about holding on to more moments with MAYZENT. Visit [mayzent.com](http://mayzent.com) to learn more.

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\*74% of people taking MAYZENT, compared to 68% of people taking placebo.

SPMS=secondary progressive multiple sclerosis.

The effect of MAYZENT was significant in patients with active SPMS and not considered significant in patients with nonactive SPMS.

- have diabetes
- have eye problems, especially an inflammation of the eye called uveitis
- have high blood pressure
- are pregnant or plan to become pregnant. MAYZENT may harm your unborn baby. Talk to your health care provider right away if you become pregnant while taking MAYZENT or if you become pregnant within 10 days after you stop taking MAYZENT.
  - If you are a woman who can become pregnant, you should use effective birth control during your treatment with MAYZENT and for at least 10 days after you stop taking MAYZENT.
- are breastfeeding or plan to breastfeed. It is not known if MAYZENT passes into your breast milk. Talk to your health care provider about the best way to feed your baby if you take MAYZENT.

**Tell your health care provider about all the medicines you take, including** prescription medicines, over-the-counter medicines, vitamins, and herbal supplements. Especially tell your health care provider if you take medicines to control your heart rhythm (anti-arrhythmics), or blood pressure (antihypertensives), or heart beat (such as calcium channel blockers or beta-blockers); take medicines that affect your immune system, such as beta-interferon or glatiramer acetate, or any of these medicines that you took in the past.

Tell your health care provider if you have recently received a live vaccine. You should avoid receiving **live** vaccines during treatment with MAYZENT. MAYZENT should be stopped 1 week before and for 4 weeks after receiving a live vaccine. If you receive a live vaccine, you may get the infection the vaccine was meant to prevent. Vaccines may not work as well when given during treatment with MAYZENT.

**MAYZENT may cause possible side effects, including:**

- **increased blood pressure.** Your health care provider should check your blood pressure during treatment with MAYZENT.
- **liver problems.** MAYZENT may cause liver problems. Your health care

provider should do blood tests to check your liver before you start taking MAYZENT. Call your health care provider right away if you have any of the following symptoms of liver problems:

- nausea
- vomiting
- stomach pain
- tiredness
- loss of appetite
- your skin or the whites of your eyes turn yellow
- dark urine

- **breathing problems.** Some people who take MAYZENT have shortness of breath. Call your health care provider right away if you have new or worsening breathing problems.
- **swelling and narrowing of the blood vessels in your brain.** A condition called PRES (Posterior Reversible Encephalopathy Syndrome) has happened with drugs in the same class. Symptoms of PRES usually get better when you stop taking MAYZENT. However, if left untreated, it may lead to a stroke. Call your health care provider right away if you have any of the following symptoms: sudden severe headache, sudden confusion, sudden loss of vision or other changes in vision, or seizure.
- **severe worsening of multiple sclerosis after stopping MAYZENT.** When MAYZENT is stopped, symptoms of MS may return and become worse compared to before or during treatment. Always talk to your doctor before you stop taking MAYZENT for any reason. Tell your health care provider if you have worsening symptoms of MS after stopping MAYZENT.

**The most common side effects of MAYZENT include:** headache, high blood pressure (hypertension), and abnormal liver tests.

These are not all of the possible side effects of MAYZENT. Call your doctor for medical advice about side effects.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit [www.fda.gov/medwatch](http://www.fda.gov/medwatch) or call 1-800-FDA-1088.

**Please see Consumer Brief Summary on following pages.**

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## CONSUMER BRIEF SUMMARY

The risk information provided here is not comprehensive. This information does not take the place of talking with your doctor about your medical condition or treatment.

To learn more about MAYZENT® (siponimod) tablets, talk to your doctor or pharmacist. For more information and to obtain the FDA-approved product labeling, call 1-888-669-6682 or visit [www.mayzent.com](http://www.mayzent.com).

### What is the most important information I should know about MAYZENT?

#### 1. MAYZENT may cause serious side effects, including: Slow heart rate (bradycardia or bradyarrhythmia) when you start taking MAYZENT.

MAYZENT can cause your heart rate to slow down, especially after you take your first dose. You should have a test to check the electrical activity of your heart called an electrocardiogram (ECG) before you take your first dose of MAYZENT.

During the initial updosing period (4 days for the 1 mg daily dose or 5 days for the 2 mg daily dose), if you miss 1 or more doses of MAYZENT, you need to restart the updosing. Call your healthcare provider if you miss a dose of MAYZENT. See **"How should I take MAYZENT?"**

#### 2. Infections. MAYZENT can increase your risk of serious infections that can be life-threatening and cause death. MAYZENT lowers the number of white blood cells (lymphocytes) in your blood. This will usually go back to normal within 3 to 4 weeks of stopping treatment. Your healthcare provider should review a recent blood test of your white blood cells before you start taking MAYZENT.

Call your healthcare provider right away if you have any of these symptoms of an infection during treatment with MAYZENT and for 3 to 4 weeks after your last dose of MAYZENT:

- fever
- vomiting
- tiredness
- headache with fever, neck stiffness, sensitivity to light, nausea, confusion (these may be symptoms of meningitis, an infection of the lining around your brain and spine)
- body aches
- chills
- nausea

#### 3. A problem with your vision called macular edema. Macular edema can cause some of the same vision symptoms as a multiple sclerosis (MS) attack (optic neuritis). You may not notice any symptoms with macular edema. If macular edema happens, it usually starts in the first 1 to 4 months after you start taking MAYZENT. Your healthcare provider should test your vision before you start taking MAYZENT and any time you notice vision changes during treatment with MAYZENT. Your risk of macular edema is higher if you have diabetes or have had an inflammation of your eye called uveitis.

Call your healthcare provider right away if you have any of the following:

- blurriness or shadows in the center of your vision
- a blind spot in the center of your vision
- sensitivity to light
- unusually colored (tinted) vision

### See **"What are possible side effects of MAYZENT?"** for more information about side effects.

#### What is MAYZENT?

MAYZENT is a prescription medicine that is used to treat relapsing forms of multiple sclerosis, to include clinically isolated syndrome, relapsing-remitting disease, and active secondary progressive disease, in adults.

It is not known if MAYZENT is safe and effective in children.

### Who should not take MAYZENT?

#### Do not take MAYZENT if you:

- have a CYP2C9\*3/\*3 genotype. Before starting treatment with MAYZENT, your CYP2C9 genotype should be determined by your healthcare provider. Ask your healthcare provider if you are not sure.
- have had a heart attack, chest pain called unstable angina, stroke or mini-stroke (transient ischemic attack or TIA), or certain types of heart failure in the last 6 months
- have certain types of heart block or irregular or abnormal heartbeat (arrhythmia), unless you have a pacemaker

### What should I tell my healthcare provider before taking MAYZENT?

#### Before taking MAYZENT, tell your healthcare provider about all of your medical conditions, including if you:

- have an irregular or abnormal heartbeat
- a history of stroke or other diseases related to blood vessels in the brain
- breathing problems, including during your sleep
- a fever or infection, or you are unable to fight infections due to a disease or taking medicines that lower your immune system. Tell your healthcare provider if you have had chicken pox or have received the vaccine for chicken pox. Your healthcare provider may do a blood test for chicken pox virus. You may need to get the full course of vaccine for chicken pox and then wait 1 month before you start taking MAYZENT.
- have slow heart rate
- have liver problems
- have diabetes
- have eye problems, especially an inflammation of the eye called uveitis
- have high blood pressure
- are pregnant or plan to become pregnant. MAYZENT may harm your unborn baby. Talk to your healthcare provider right away if you become pregnant while taking MAYZENT or if you become pregnant within 10 days after you stop taking MAYZENT.
  - If you are a woman who can become pregnant, you should use effective birth control during your treatment with MAYZENT and for at least 10 days after you stop taking MAYZENT.
- are breastfeeding or plan to breastfeed. It is not known if MAYZENT passes into your breast milk. Talk to your healthcare provider about the best way to feed your baby if you take MAYZENT.

#### Tell your healthcare provider about all the medicines you take, including prescription medicines, over-the-counter medicines, vitamins, and herbal supplements. Especially tell your healthcare provider if you:

- take medicines to control your heart rhythm (antiarrhythmics), or blood pressure (antihypertensives), or heart beat (such as calcium channel blockers or beta-blockers)
- take medicines that affect your immune system, such as beta-interferon or glatiramer acetate, or any of these medicines that you took in the past
- have recently received a live vaccine. You should avoid receiving live vaccines during treatment with MAYZENT. MAYZENT should be stopped 1 week before and for 4 weeks after receiving a live vaccine. If you receive a live vaccine, you may get the infection the vaccine was meant to prevent. Vaccines may not work as well when given during treatment with MAYZENT.

Know the medicines you take. Keep a list of your medicines with you to show your healthcare provider and pharmacist when you get a new medicine.

Using MAYZENT and other medicines together may affect each other causing serious side effects.



### How should I take MAYZENT® (siponimod) tablets?

The daily maintenance dose of MAYZENT is either 1 mg or 2 mg, depending on your CYP2C9 genotype. Ask your healthcare provider if you are not sure about your daily maintenance dose.

Start your treatment with MAYZENT using the following titration schedule:

For the 1 mg daily maintenance dose:	Tablets a day
Day 1	1 x 0.25 mg tablet
Day 2	1 x 0.25 mg tablet
Day 3	2 x 0.25 mg tablet
Day 4	3 x 0.25 mg tablet
Day 5 and every day after	4 x 0.25 mg tablet

For the 2 mg daily maintenance dose, use the starter pack:	Tablets a day
Day 1	1 x 0.25 mg tablet
Day 2	1 x 0.25 mg tablet
Day 3	2 x 0.25 mg tablet
Day 4	3 x 0.25 mg tablet
Day 5	5 x 0.25 mg tablet
Day 6 and every day after	1 x 2 mg tablet

- Take MAYZENT exactly as your healthcare provider tells you. Do not change your dose or stop taking MAYZENT unless your healthcare provider tells you to.
- Take MAYZENT 1 time each day.
- Take MAYZENT with or without food.
- If you miss 1 or more doses of MAYZENT **during** the initial dose titration, you need to restart the medication.
- If you miss a dose of MAYZENT **after** the initial dose-titration, take it as soon as you remember.
- If MAYZENT treatment is stopped for 4 days in a row, treatment has to be restarted with the titration.
- **Do not stop taking MAYZENT without talking with your healthcare provider first.**

### What are the possible side effects of MAYZENT?

**MAYZENT may cause serious side effects, including:**

- **See “What is the most important information I should know about MAYZENT?”**
- **increased blood pressure.** Your healthcare provider should check your blood pressure during treatment with MAYZENT.
- **liver problems.** MAYZENT may cause liver problems. Your healthcare provider should do blood tests to check your liver before you start taking MAYZENT. Call your healthcare provider right away if you have any of the following symptoms of liver problems:
  - nausea
  - vomiting
  - stomach pain
  - tiredness
  - loss of appetite
  - your skin or the whites of your eyes turn yellow
  - dark urine
- **breathing problems** Some people who take MAYZENT have shortness of breath. Call your healthcare provider right away if you have new or worsening breathing problems.
- **swelling and narrowing of the blood vessels in your brain.** A condition called PRES (Posterior Reversible Encephalopathy Syndrome) has happened with drugs in the same class. Symptoms of PRES usually get better when you stop taking MAYZENT. However, if left untreated, it may lead to a stroke. Call your healthcare provider right away if you have any of the following symptoms:

- sudden severe headache
- sudden loss of vision or other changes in your vision
- sudden confusion
- seizure

- **severe worsening of multiple sclerosis after stopping MAYZENT.** When MAYZENT is stopped, symptoms of MS may return and become worse compared to before or during treatment. Always talk to your doctor before you stop taking MAYZENT for any reason. Tell your healthcare provider if you have worsening symptoms of MS after stopping MAYZENT.

### The most common side effects of MAYZENT include:

- headache
- high blood pressure (hypertension)
- abnormal liver tests

Tell your healthcare provider if you have any side effects that bother you or that do not go away.

These are not all of the possible side effects of MAYZENT. For more information, ask your healthcare provider or pharmacist. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

### How should I store MAYZENT?

Before opening:

- MAYZENT 0.25 mg and 2 mg tablets should be stored in a refrigerator between 36°F to 46°F (2°C to 8°C).

After opening:

- MAYZENT 0.25 mg tablets **in the Starter Pack** may be stored at room temperature, 68°F to 77°F (20°C to 25°C), for up to 1 week after opening.
- MAYZENT 0.25 mg and 2 mg tablets **in bottles** may be stored at room temperature, 68°F to 77°F (20°C to 25°C), for up to 1 month after opening.

**Keep MAYZENT and all medicines out of the reach of children.**

### General information about the safe and effective use of MAYZENT

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use MAYZENT for a condition for which it was not prescribed. Do not give MAYZENT to other people, even if they have the same symptoms you have. It may harm them. You can ask your pharmacist or healthcare provider for more information about MAYZENT that is written for health professionals.

### What are the ingredients in MAYZENT?

**Active ingredient:** siponimod

**Inactive ingredients:** colloidal silicon dioxide, crospovidone, glyceryl behenate, lactose monohydrate, microcrystalline cellulose, with a film coating containing iron oxides (black and red iron oxides for the 0.25 mg strength and red and yellow iron oxides for the 2 mg strength), lecithin (soy), polyvinyl alcohol, talc, titanium dioxide, and xanthan gum.

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For more information, go to [www.pharma.us.novartis.com](http://www.pharma.us.novartis.com) or call 1-888-669-6682.

# Clinical Trials

## The Key to Progress in Treating Pediatric MS

In May 2018, Gilenya® (fingolimod) became the first drug approved by the United States Food and Drug Administration (FDA) to treat multiple sclerosis (MS) in pediatric patients.<sup>1</sup> Thousands of researchers and clinicians worked for many years to reach that milestone, but in the end, it was attained by the courage and commitment of 215 young people and their parents.

Those children and adolescents participated in PARADIGMS, a Phase III study that assessed the safety and effectiveness of Gilenya relative to interferon beta-1a<sup>2</sup> (given in a dose of 30 ug weekly).

The study found that while both medications reduced the relapse rate from patients' baseline experience,

Gilenya cut relapses to a much greater extent than the other agent.<sup>2</sup> Further, the study showed that the side effects seen with Gilenya in pediatric patients were similar to those in adults.<sup>1</sup>

PARADIGMS was a large trial, involving more than 80 study sites in 25 countries. Despite that worldwide scope, it took researchers three years to enroll 215 patients.<sup>3</sup> Another international study with 77 sites in 22 countries took 3.5 years to enroll 166 patients.<sup>3</sup>

Emmanuelle Waubant, MD, says that while several factors pose obstacles to conducting clinical trials in children and adolescents with MS, those challenges must be overcome if pediatric patients are going to benefit from a range of safe, effective therapies. The small size of the pediatric MS population is one of the most significant impediments to trial recruitment, notes Dr. Waubant, a professor of neurology at the University of California, San Francisco (UCSF) and expert in pediatric MS. She explains that there are fewer than 5,000 pediatric MS patients in the United States, and perhaps only 10,000 or so children and adolescents with MS worldwide. Further, because the median age for onset of symptoms in pediatric MS is 15 years, most patients can only participate in pediatric trials for a few years before they reach adulthood.

To help overcome those and other obstacles, the International Pediatric Multiple Sclerosis Study Group (IPMSSG) convened a meeting of 14 pediatric MS experts in New York City in January 2018. As chair of





the IPMSSG's Clinical Trial Task Force, Dr. Waubant led the proceedings. She explains that the goal was to identify study designs and best practices that would generate high-quality evidence on the safety of MS therapies in children and adolescents, and to help remove regulatory and insurance barriers to obtaining treatment.<sup>3</sup>

The recommendations, which were published in the online version of *Neurology* this May, include calls for:

- conducting pediatric pharmacokinetic and pharmacodynamic studies for all new MS therapies for which such testing is feasible to identify the appropriate dose in children
- avoiding placebo-controlled trials of immunomodulatory agents already proven to be effective in adults
- allowing open-label studies that focus on safety and pharmacology to be sufficient to approve the pediatric use of an MS therapy that already has been well-studied and approved in adults and that has been shown through analyses to have a strong likelihood of efficacy in children and adolescents
- when a Phase III, controlled trial is required, employing MRI findings rather than clinical events as the primary endpoint whenever possible, because a strong correlation between the two has

been demonstrated and using MRI findings allows for a shorter trial period

- considering the addition of teenagers to some Phase III trials of investigational MS therapies being assessed in adults
- enrolling pediatric MS patients in registries to monitor the long-term safety of medications
- choosing approaches for testing that minimize inconvenience to patients and their families<sup>3</sup>

“The aim is to ensure the safety of medications that may be used to treat MS in children and adolescents, but to do so in a way that leverages thoughtful study designs and the large database we have in adult patients,” Dr. Waubant explains.

No matter how innovative its design, however, a study can only be meaningful if enough patients enroll to make its findings statistically reliable. For that reason, Dr. Waubant urges parents and patients to talk with their MS clinician about clinical trials, and to consider participating.

MSAA can also help parents and patients find MS clinical trials. Working in partnership with Antidote, a digital health company, MSAA offers an easy-to-use clinical trial search function on its website, available at [mymsaa.org/clinicaltrials](https://mymsaa.org/clinicaltrials). ■

## References

- <sup>1</sup> U.S. Food and Drug Administration (FDA). FDA expands approval of Gilenya to treat multiple sclerosis in pediatric patients. May 11, 2018. Available at: <https://www.fda.gov/news-events/press-announcements/fda-expands-approval-gilenya-treat-multiple-sclerosis-pediatric-patients>. Accessed July 28, 2019.
- <sup>2</sup> Chitnis, T, Arnold DL, Banwell B, et al. Trial of fingolimod versus interferon beta-1a in pediatric multiple sclerosis. *N Engl J Med*. 2018;379(11):1017-27.
- <sup>3</sup> Waubant E, Banwell B, Wassmer E, et al. Clinical trials of disease-modifying agents in pediatric MS. *Neurology*. May 2019, 92 (22) e2538-e2549; DOI:10.1212/WNL.0000000000007572.



# NMO: It's No Longer Considered a Form of MS

**By Dr. Barry Hendin**

MSAA's Chief Medical Officer

**Q: A friend of mine says that she has a less-common form of MS called neuromyelitis optica (NMO) or Devic's disease. When I searched online for more information, I saw that NMO is not MS, but is often misdiagnosed as MS. Could you please tell me if this is true, and if so, what are the symptoms of NMO and how does it differ from MS?**

**A:** You are correct that NMO (neuromyelitis optica) or NMOSD (neuromyelitis optica spectrum disorder) is a distinct entity and is no longer believed to be a form of multiple sclerosis. Typical presentations are similar to MS, including optic neuritis (inflammation along the optic nerve) and myelitis (spinal cord inflammation), but some less-frequent symptoms can be intractable hiccups or vomiting.

The major differences are that NMOSD is due to an identified antibody (antiaquaporin 4 antibody) that attacks specialized, star-shaped cells in the brain called astrocytes. These are the most numerous cells in the brain and perform multiple tasks in

maintaining, supporting, and repairing the central nervous system. One of the most important roles is maintaining the blood-brain barrier in order to regulate water transfer into the nervous system. Additionally, these attacks are often more severe and destructive than attacks in MS.

Until recently, no FDA-approved therapies were available for NMOSD. Clinicians used immunosuppressive therapies that were approved for other conditions, which is referred to as using a medication "off-label." However, since that time, the FDA has approved the first therapy for aquaporin-positive NMOSD. This medication, Soliris® (eculizumab), is also approved to treat three other less-common conditions and is given via intravenous (IV) infusion.

**Q: I was 57 when I was diagnosed, but I probably had MS for a long time and had no clue. I have been doing very well on a disease-modifying therapy for 12 years. My question is about MS and hormone replacement therapy (HRT). After being on HRT since my mid 40's, I stopped HRT last year (at age 68) because I was having painful cramps every month and there was no other reason found for this.**



## MSAA's New Chief Medical Officer: Dr. Barry Hendin

We welcome Dr. Barry Hendin as MSAA's new chief medical officer! Dr. Hendin's appointment follows the retirement of MSAA's longtime chief medical consultant, Dr. Jack Burks, in June. For details, please see page 31.

Barry A. Hendin, MD, is a highly accomplished neurologist who specializes in MS and has spoken at several of MSAA's educational programs. Dr. Hendin currently practices medicine at Phoenix Neurological Associates, Ltd., where he has been a neurologist for the past 45 years. He also holds the position of director of the Multiple Sclerosis Clinic at Banner University Medical Center and is a clinical professor of neurology at the University of Arizona Medical School.

Dr. Hendin has been appointed to nearly 30 councils, committees, board of directors, and a task force, all in the fields of medicine, patient care, education, and research. He has received more than a dozen honors and awards, co-authored more than 30 medical articles, and given more than 50 presentations to medical professionals. Additionally, Dr. Hendin has been the principal investigator for more than 115 clinical trials, evaluating the safety and effectiveness of different treatments for a host of neurological conditions.


**However, after stopping HRT, my quality of life became very bad. I have since gone back on HRT every other day, and so far after two months, I've had no pain and I feel a lot better. After doing some reading, I think menopause isn't just an aging phenomenon, but as a book I read said, it is a hormone-deficiency problem. Do you know if any hormone research, especially in older women with MS, is being looked into with any seriousness?**

**A:** Menopause is a normal part of aging that occurs when a woman's estrogen level falls. It has been estimated that 50% of women with MS are post-menopausal. Many women with MS report an increase in symptoms during this time. A number of small studies have been conducted looking at menopause

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and the role of HRTs for the treatment of menopause in women with MS.

Unfortunately, the studies have been inconclusive. Some women reported an improvement in their MS symptoms with HRTs and some did not.

Many women reported that hot flashes due to menopause transiently worsened their MS symptoms. Others reported that sleep disturbance associated with menopause increased their fatigue as well as cognitive and mood symptoms. Some problems seem to be reciprocal or interactive. For instance, increased bladder symptoms can decrease sleep, and the decrease in sleep can increase MS symptoms.

Clearly, we need to study the post-menopausal phase of life more closely. We need to understand the complex interaction of aging, hormonal effects, and MS. It is equally clear that we need to focus attention on quality-of-life issues that occur in post-menopausal women with MS. These issues include the role of disease-modifying therapies, HRTs, and the medical consequences of aging in MS. We also need to pay attention to age-related issues such as osteoporosis, bladder function, cognition, mood, mobility, societal engagement, and general quality of life. We hope to see more studies with MS patients in the future.

**Q: I am the primary caregiver for my 14-year-old son who was recently diagnosed with MS. One of the questions I have is, why is he**

**heat-sensitive? For example, we live in Florida, and prior to being diagnosed with MS, my son played soccer and could play outside in the heat for hours. Since his diagnosis, he has trouble walking for more than 30 feet. He is fine for the first few minutes, but then his body shuts down – particularly with his left foot.**

**What I don't understand is why this happens and how to get this better. He changed his diet (eliminated dairy, gluten, and red meat), exercises five-to-six times a week, only drinks water, and takes recommended supplements.**

**A:** First, as noted in this issue's cover story, I wanted to reiterate that increasing attention has been focused on pediatric multiple sclerosis and the need to treat young people with MS early and effectively in order to maintain long-term function and to reduce disability. Previously, most clinical trials focused on adults (18 and older). Gilenya® (fingolimod) has been approved specifically for pediatric MS, but most of the other disease-modifying therapies are used off-label in treating pediatric MS. The future for people with MS – including children with MS – is looking brighter because of our increased understanding of the disease and the increased availability of effective therapies.

Second, to answer your question about why your son is heat-sensitive, heat slows the conduction of nerve signals along demyelinated nerves. This makes the transmission of nerve signals less efficient,

so messages from the brain and spinal cord going to other parts of the body are delayed. Additionally, the body must work harder to transmit these signals.

Fortunately, this is a temporary effect and should resolve after your son cools off. Several strategies will help to reduce heat-related symptoms, including good hydration, drinking nonalcoholic frozen beverages, staying inside

during the hottest times of the day, using air conditioning, and wearing cooling devices such as cooling vests and other accessories. MSAA's Cooling Distribution program provides free cooling vests (including vests for children) and accessories to those who qualify. Many people who use this type of cooling technology find that they may return to their outdoor summertime activities and their symptoms of heat sensitivity are greatly reduced. ■

## Jack Burks, MD, Retires

Everyone at MSAA would like to wish **Dr. Jack Burks** all the best in his retirement from his position as MSAA's chief medical consultant. He worked with MSAA for many years and has been a wonderful resource, advisor, and friend. As Dr. Burks concludes his MS career, he shares these parting words to follow.

"I want MSAA's members and families, as well as my colleagues and friends, to know how much I have appreciated the opportunities to share my knowledge and insights. I want to thank the dedicated client-focused staff at MSAA, along with the members of MSAA's Healthcare Advisory Council and Board of Directors. I am proud to have worked with each of you in our continuing quest to improve the lives of everyone affected by MS.

"In addition to my work at MSAA, my career highlights include helping to establish several MS centers in the United States and MS programs in 50 countries. I have spoken at several medical conferences, taught at universities, and written a number of MS textbooks and research papers. However, my proudest accomplishment was to raise three wonderful, successful, and loving children. They are now pursuing their own careers and living in Seattle, Beijing, and London.

"I want to emphasize to the MS community that the medical field has already made much progress in limiting MS damage. Soon, ways to repair and restore lost function will be discovered – and nothing would make me happier. I also would like to note that professionally, I was honored to have been a part of the MSAA team for so many years."



*MSAA President and CEO Gina Ross Murdoch presents Dr. Jack Burks with a plaque in recognition of his many years of dedicated service to MSAA.*



# Chronic Active Lesions Signify Aggressive Forms of MS

In August of this year, the National Institutes of Health (NIH) published a news release explaining the connection between chronic active lesions and more aggressive as well as disabling forms of multiple sclerosis (MS). Using a high-powered 7-tesla magnetic resonance scanner (MRI), researchers were able to identify these types of “smoldering” lesions, which are areas of damaged myelin (the protective covering to the nerves). This damage is caused by an attack on the central nervous system (CNS) by one’s own immune system.

While many MS lesions will either fully or partially heal, these chronic active lesions appear to “actively expand or smolder” for many years. However, identifying these more active types of lesions and understanding their role in MS has been a challenge to researchers in the past. Using the high-powered MRI, investigators have since confirmed that these chronic active lesions have a dark rim encompassing the lesion, and this has allowed researchers to observe how each lesion evolves in connection with the disease activity each patient experiences.

Conducting brain scans on 192 individuals with MS who were participating in a trial at the NIH’s Clinical Center, the investigators discovered that the greater the number of rimmed lesions, the more aggressive or disabling a person’s MS would be. The results

showed that unrelated to whatever treatment one was receiving, 44% of participants only had lesions without a rim; 37% had one to three lesions with rims; and 22% had four or more rimmed lesions. Those in this latter group – with four or more chronic active lesions – were 1.6-times more likely to be diagnosed with progressive MS versus those individuals who did not have any lesions with rims. Additionally, these patients were found to have less white brain matter and smaller basal ganglia – a part of the brain that processes information for coordination and movement.

The discovery of these “smoldering” rimmed lesions and the technology needed to identify them will help to predict which patients will experience the most aggressive forms of MS. This discovery may also assist with the development of better treatments.

## Investigational Oral Medication Reduces Number of Lesions on MRI

Evobrutinib (M2951) is an oral medication being evaluated for potential use in relapsing forms of multiple sclerosis and in secondary-progressive MS. The agent inhibits Bruton’s tyrosine kinase (BTK), an enzyme that regulates the function of B cells and macrophages, components of the immune system shown to play a role in MS.

A recent Phase II study of 267 adults with relapsing forms of MS examined how various

doses of evobrutinib affected the total number of T1 gadolinium-enhancing lesions seen on magnetic resonance imaging (MRI) at weeks 12, 16, 20, and 24 of treatment versus placebo. The study also assessed safety, the annualized relapse rate (ARR), and MRI findings at weeks 24 and 48.

The total number of T1 gadolinium-enhancing lesions was significantly reduced in patients receiving 75 mg of evobrutinib daily or twice daily. The ARR over 48 weeks was 0.25 for patients receiving 75 mg of evobrutinib once daily and 0.11 for those receiving 75 mg of the agent twice daily, as compared to 0.37 for the placebo group over 24 weeks. Significant elevations in liver enzymes affected up to 5.4% of patients receiving evobrutinib. The study's authors concluded that their findings supported further study of the agent.

### **Progress Toward Identifying a Tysabri Dosing Schedule that Best Balances Benefits and Risk**

Tysabri® (natalizumab) reduces disability and relapses in relapsing-remitting multiple sclerosis (RRMS), but also increases the risk of progressive multifocal leukoencephalopathy (PML), an opportunistic viral infection of the brain that can be life-threatening. Three factors appear to drive the increased risk of PML associated with taking Tysabri: longer use of the disease-modifying therapy (DMT), particularly use beyond two years; prior treatment with an immunosuppressant agent; and having anti John Cunningham Virus (anti-JCV) antibodies.

With these risk factors in mind, clinicians

regularly consider a person's past treatment history and test them for anti-JCV antibodies when assessing whether he or she is a candidate for Tysabri. Additionally, to help more people obtain the benefits of the DMT while minimizing their risk for PML, researchers have been studying whether spreading out the dosing schedule for Tysabri can reduce the risk associated with the medication while maintaining its effectiveness.

The approved dosing schedule entails an intravenous infusion of 300 mg every four weeks. Data collected from the TOUCH prescribing program sponsored by Biogen, which markets Tysabri, indicates that extending the interval between infusions to up to three months can significantly reduce the risk of PML, with a risk reduction of up to 90% seen in one analysis. Researchers will need to continue to collect and analyze data from the TOUCH prescribing program to confirm these findings. ■

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For general information or to speak with a trained Client Services Specialist, please call MSAA's Helpline at **(800) 532-7667**, extension 154. Questions to MSAA's Client Services department may also be emailed to **MSquestions@mymsaa.org**.

***Portions written by Susan Wells Courtney, MSAA Senior Writer, and Tom Garry, Medical Writer***

***Reviewed by Barry A. Hendin, MD  
MSAA Chief Medical Officer***

# Knowledge is Power

**By Peter Damiri**

Vice President of Programs and Services

Recognizing that “Knowledge is Power,” MSAA offers a wide array of information, educational programs, and outreach to help the MS community stay updated and connected. To follow are details on these informative programs!

## In-Person Programs

Organized and hosted by MSAA’s Directors of Education and Healthcare Relations, we are excited to launch a new series of informative, in-person educational programs taking place this fall and into 2020. Upcoming programs include: Women and MS; The Many Faces of MS – Exploring Diversity within Multiple Sclerosis; Understanding Your Rights as an Employee with MS: A Discussion on Employment and Workplace Accommodations; and MS Journey: Managing Your MS Through the Years.

These free educational programs provide an excellent opportunity for individuals with MS and their care partners to learn about the latest advances in MS, coping strategies, and healthcare management from many of the country’s leading experts. Additionally, MSAA’s educational programs offer a terrific opportunity for people to connect, share experiences, and build friendships. To learn more, please visit [mymsaa.org/calendar](https://mymsaa.org/calendar) or call **(800) 532-7667**.

## Publications

In addition to the articles found in *The Motivator*, MSAA publishes a wealth of important information on many aspects involving MS. For details, please visit [mymsaa.org/publications](https://mymsaa.org/publications) or call **(800) 532-7667** to order copies of available publications.

An MS care partner recently noted, “I appreciate your ongoing support and know that the information you have provided has been invaluable to me,” said Merle B. of New Jersey. “The only ‘control’ I can have in this uncontrollable situation is to be as informed as I can be so that I can be an advocate for my husband.”

## Podcasts and Expanded Digital Content

Earlier this year, MSAA launched several new and very exciting digital initiatives to create new content and expand our delivery of MS information. As part of the “MS and the Family” campaign, MSAA developed and produced educational podcasts, which are posted on our website and available on popular podcast networks including Apple, Android, Stitcher, etc. The four inaugural podcasts addressed the important aspects of MS and relationships, care partnering, diversity, and nutrition by leading healthcare professionals. Additionally, these topics were

*continued on page 38*



# NOW APPROVED



 **MAVENCLAD**<sup>®</sup>  
(cladribine) tablets 10 mg

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MAVENCLAD is the first and only short-course oral therapy for relapsing forms of multiple sclerosis.

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## What is MAVENCLAD?

MAVENCLAD is used to treat relapsing forms of multiple sclerosis (MS), to include relapsing-remitting disease and active secondary progressive disease, in adults. Because of its safety profile, MAVENCLAD is generally used in people who have tried another MS medicine that they could not tolerate or that has not worked well enough.

MAVENCLAD is not recommended for use in people with clinically isolated syndrome (CIS).

## **MAVENCLAD may cause serious side effects.**

**Treatment with MAVENCLAD may increase your risk of developing cancer. You should follow healthcare provider instructions about screening for cancer. Because of the risk of fetal harm, do not take MAVENCLAD if you are pregnant or of childbearing potential or male able to father a child and not using effective birth control.**

**Do not** take MAVENCLAD if you: have cancer (malignancy), are breastfeeding, are human immunodeficiency virus (HIV) positive, have active infections, including tuberculosis (TB), hepatitis B or C or are allergic to cladribine.

## **TO LEARN MORE TALK TO YOUR HEALTHCARE PROVIDER.**

You can also visit [mavenclad.com](http://mavenclad.com) or call **1-877-447-3243**.

Please see Important Safety Information, including **serious side effects**, on the following pages.

## IMPORTANT INFORMATION ABOUT MAVENCLAD® (cladribine) tablets, for oral use

Read this information carefully before using MAVENCLAD and each time you get a refill, as there may be new information. This information does not take the place of talking with your healthcare provider (HCP).

### What is the most important information I should know about MAVENCLAD?

#### MAVENCLAD can cause serious side effects, including:

- **Risk of cancer (malignancies).** Treatment with MAVENCLAD may increase your risk of developing cancer. Talk to your healthcare provider about your risk of developing cancer if you receive MAVENCLAD. You should follow your healthcare provider instructions about screening for cancer.
- **MAVENCLAD may cause birth defects if used during pregnancy. Females must not be pregnant when they start treatment with MAVENCLAD or become pregnant during MAVENCLAD dosing and within 6 months after the last dose of each yearly treatment course. Stop your treatment with MAVENCLAD and call your healthcare provider right away if you become pregnant during treatment with MAVENCLAD.**

- For females who are able to become pregnant:
  - Your healthcare provider should order a pregnancy test for you before you begin your first and second yearly treatment course of MAVENCLAD to make sure that you are not pregnant. Your healthcare provider will decide when to do the test.
  - Use effective birth control (contraception) on the days on which you take MAVENCLAD and for at least 6 months after the last dose of each yearly treatment course.
    - Talk to your healthcare provider if you use oral contraceptives (the "pill").
    - You should use a second method of birth control on the days on which you take MAVENCLAD and for at least 4 weeks after your last dose of each yearly treatment course.
- For males with female partners who are able to become pregnant:
  - Use effective birth control (contraception) during the days on which you take MAVENCLAD and for at least 6 months after the last dose of each yearly treatment course.

### What is MAVENCLAD?

MAVENCLAD is a prescription medicine used to treat relapsing forms of multiple sclerosis (MS), to include relapsing remitting disease and active secondary progressive disease, in adults. Because of its safety profile, MAVENCLAD is generally used in people who have tried another MS medicine that they could not tolerate or that has not worked well enough.

MAVENCLAD is not recommended for use in people with clinically isolated syndrome (CIS).

It is not known if MAVENCLAD is safe and effective in children under 18 years of age.

**Do not** take MAVENCLAD if you:

- have cancer (malignancy).
- are pregnant, plan to become pregnant, or are a woman of childbearing age or a man able to father a child and you are not using birth control. See **"What is the most important information I should know about MAVENCLAD?"**
- are human immunodeficiency virus (HIV) positive.
- have active infections, including tuberculosis (TB), hepatitis B or C.
- are allergic to cladribine.
- are breastfeeding. See **"Before you take MAVENCLAD, tell your healthcare provider about all of your medical conditions, including if you:"**

**Before you take MAVENCLAD, tell your healthcare provider about all of your medical conditions, including if you:**

- think you have an infection.
- have heart failure.
- have liver or kidney problems.
- have taken, take, or plan to take medicines that affect your immune system or your blood cells, or other treatments for MS. Certain medicines can increase your risk of getting an infection.
- have had a recent vaccination or are scheduled to receive any vaccinations. You should not receive live or live-attenuated vaccines within the 4 to 6 weeks preceding your treatment with MAVENCLAD. You should not receive these types of vaccines during your treatment with MAVENCLAD and until your healthcare provider tells you that your immune system is no longer weakened.
- have or have had cancer.
- are breastfeeding or plan to breastfeed. It is not known if MAVENCLAD passes into your breast milk. Do not breastfeed on the days on which you take MAVENCLAD, and for 10 days after the last dose. See **"Do not** take MAVENCLAD if you:"

**Tell your healthcare provider about all the medicines you take**, including prescription and over-the-counter medicines, vitamins, and herbal supplements.

### How should I take MAVENCLAD?

- Limit contact with your skin. Avoid touching your nose, eyes and other parts of the body. If you get MAVENCLAD on your skin or on any surface, wash it right away with water.
- Take MAVENCLAD at least 3 hours apart from other medicines taken by mouth during the 4- to 5-day MAVENCLAD treatment week.

- If you miss a dose, take it as soon as you remember on the same day. If the whole day passes before you remember, take your missed dose the next day. **Do not take 2 doses at the same time.** Instead, you will extend the number of days in that treatment week.

Your healthcare provider will continue to monitor your health during the 2 yearly treatment courses, and for at least another 2 years during which you do not need to take MAVENCLAD. It is not known if MAVENCLAD is safe and effective in people who restart MAVENCLAD treatment more than 2 years after completing 2 yearly treatment courses.

### What are the possible side effects of MAVENCLAD?

#### MAVENCLAD can cause serious side effects, including:

- See **“What is the most important information I should know about MAVENCLAD?”**
- **low blood cell counts.** Low blood cell counts have happened and can increase your risk of infections during your treatment with MAVENCLAD. Your healthcare provider will do blood tests before you start treatment with MAVENCLAD, during your treatment with MAVENCLAD, and afterward, as needed.
- **serious infections such as:**
  - **TB, hepatitis B or C, and shingles (herpes zoster).** Fatal cases of TB and hepatitis have happened with cladribine during clinical studies. Tell your healthcare provider right away if you get any symptoms of the following infection related problems or if any of the symptoms get worse, including:
    - fever
    - aching painful muscles
    - headache
    - feeling of being generally unwell
    - loss of appetite
    - burning, tingling, numbness or itchiness of the skin in the affected area
    - skin blotches, blistered rash and severe pain
  - **progressive multifocal leukoencephalopathy (PML).** PML is a rare brain infection that usually leads to death or severe disability. Although PML has not been seen in MS patients taking MAVENCLAD, it may happen in people with weakened immune systems. Symptoms of PML get worse over days to weeks. Call your healthcare provider right away if you have any new or worsening neurologic signs or symptoms of PML, that have lasted several days, including:
    - weakness on 1 side of your body
    - loss of coordination in your arms and legs

- decreased strength
- problems with balance
- changes in your vision
- changes in your thinking or memory
- confusion
- changes in your personality

- **liver problems.** MAVENCLAD may cause liver problems. Your healthcare provider should do blood tests to check your liver before you start taking MAVENCLAD. Call your healthcare provider right away if you have any of the following symptoms of liver problems:

- nausea
- vomiting
- stomach pain
- tiredness
- loss of appetite
- your skin or the whites of your eyes turn yellow
- dark urine

- **allergic reactions (hypersensitivities).** MAVENCLAD can cause serious allergic reactions. Stop your treatment with MAVENCLAD and go to the closest emergency room for medical help right away if you have any signs or symptoms of allergic reactions. Symptoms of an allergic reaction may include: skin rash, swelling or itching of the face, lips, tongue or throat, or trouble breathing.

- **heart failure.** MAVENCLAD may cause heart failure, which means your heart may not pump as well as it should. Call your healthcare provider or go to the closest emergency room for medical help right away if you have any signs or symptoms such as shortness of breath, a fast or irregular heart beat, or unusual swelling in your body. Your healthcare provider may delay or completely stop treatment with MAVENCLAD if you have severe side effects.

#### The most common side effects of MAVENCLAD include:

- upper respiratory infection
- headache
- low white blood cell counts

These are not all the possible side effects of MAVENCLAD. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

**Distributed by:** EMD Serono, Inc., Rockland, MA 02370

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For more information, call toll-free 1-877-447-3243 or go to [www.mavenclad.com](http://www.mavenclad.com)





*continued from page 34*

also explored by MS experts through national live-streamed webinars and Ask Me Anything (AMA) online chat programs.

Following the “Intimacy and Family Planning with MS” webinar, many viewers posted comments expressing their appreciation for MSAA spotlighting this important, but often under-discussed topic. Kristin W. from Michigan shared her thoughts about the presenter, Kimberly Castelo, a licensed marriage and family therapist who also has MS. “Kimberly’s presentation style was very engaging and easy to listen to,” noted Kristin. “I loved the real-time feel and pace of this presentation and Kimberly answering quick questions along the way. Thank you for offering this program!”

These archived webinars, podcasts, and AMAs can be accessed on MSAA’s website, [mymsaa.org](http://mymsaa.org), by clicking on the tabs for Podcasts, MSi Videos, and My MSAA Community.

Also new this year was the creation of an online series to help report continual advances in MS treatment and care titled, “What’s New in MS Research.” Distributed through email, this bimonthly digital article series highlights major announcements in the field of MS study. MSAA’s other bimonthly digital offering, *My MSAA Today*, is an e-newsletter that provides a variety of useful information. Receiving emails from MSAA is a great way to become informed. If you have not done so already, please visit [mymsaa.org/signup](http://mymsaa.org/signup) to register and receive email updates.

## Mobile Phone App

MSAA’s free mobile phone app, My MS Manager, helps users to manage their MS by tracking disease and symptom activity, storing medical information, and sharing charts and data with their healthcare team. In partnership with MSAA’s app developer, @Point of Care, we launched several new upgrades, including the addition of both cognition and depression patient self-assessment scales (adding to the app’s fatigue patient self-assessment scale) and 12 short educational videos as part of a comprehensive series titled “Understanding Multiple Sclerosis,” featuring MS expert neurologist Dr. Michelle Fabian. Plans are underway for additional patient self-assessment scales and other upgrades. The My MS Manager app is available for both Android and iOS devices. Links to download the app can be found at [mymsaa.org/mobile](http://mymsaa.org/mobile) or downloaded directly at the Apple App and Google Play stores.

## Helpline

MSAA’s Helpline is available to connect individuals with MS and their loved ones to our staff of trained and dedicated social-service professionals. Along with providing people with a wealth of resources and referrals, the Helpline staff offers a tremendous amount of encouragement, compassion, and empathy to our clients and their families. To connect with an MSAA Client Services Specialist, please call our toll-free Helpline at **(800) 532-7667, ext. 154** between 8:30 am and 5:00 pm Eastern Time (ET), Monday through Friday, and until 8:00 pm ET on Wednesdays. ■

# Do you have an upcoming *special occasion?*

MSAA is now offering updated **wedding and event favors!**

By making a donation to MSAA in place of a conventional occasion favor, MSAA will provide you with personalized favors for your celebration to announce your generous gift! Your favor will come in the form of a bookmark that you will be able to customize once your donation is complete.



To learn more about MSAA's occasion favors, please visit [support.mymsaa.org/favors](https://support.mymsaa.org/favors).



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# Direct Impact

by Erich Fasnacht, Vice President of Development • Fundraising profiles by Kaitlyn Gallagher

When it comes time to write a check to an organization, a non-profit organization, don't you just want the money to have a direct impact on someone's life? Isn't that what it's all about?

There are, of course, think-tanks and orchestras, pure-research outfits, and Washington-DC type activist groups. And I am sure they all have their own type of impact at some point down the line. But doesn't it feel good to know that when giving to some organizations, like MSAA, you are meeting a daily need of a person who is living with MS?

Over the course of my day, I may be holding a cooling vest in my hand to show it to someone. I can feel that vest, in my hand... the pouches for the ice... the way it fits around the body. This tangible item goes directly to someone who has MS. We can't buy these without your support. Each day as I walk through our storage facility, I pass by wheelchairs, walkers, canes, and special

utensils for those individuals who are no longer able to grip a fork or spoon. I'm proud to work for an organization that provides such tangible assistance.

Direct impact is what we're all about. Improving Lives Today. It's been our mantra and will continue to be. While noble folks across our land do address big issues in think-tank type environments, and we applaud them for that, we also want to make sure that the neighbor down the road has that wheelchair, that needed MRI, that cooling vest – to make a direct impact in his or her life. Today.

Please contact me directly with any thoughts you have on donating to MSAA today, or making MSAA part of your legacy giving. Thank you. ■

**Erich Fasnacht**  
**(800) 532-7667, ext. 101**  
**[efasnacht@mysaa.org](mailto:efasnacht@mysaa.org)**



## HALF-MARATHON WITH MICKEY

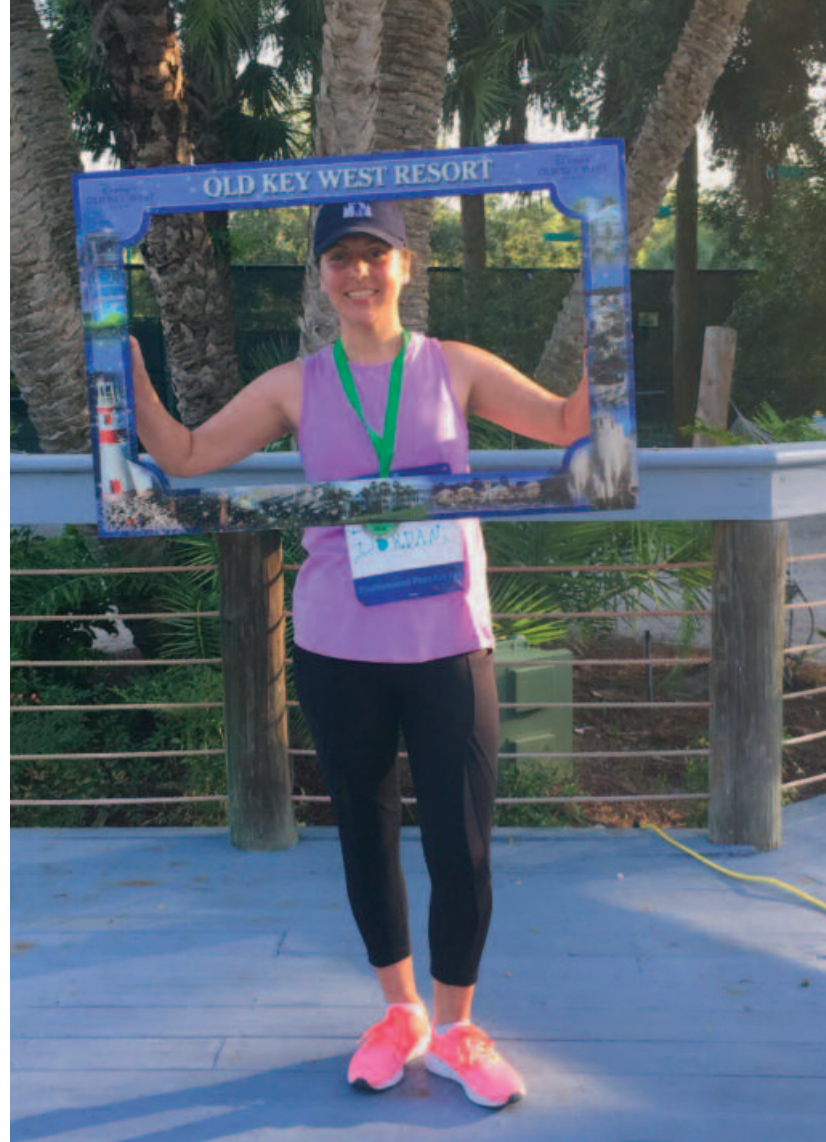
Before discovering Team MSAA, Jennifer Meyer had taken some time off from exercise after receiving an MS diagnosis. “Unfortunately, I quit running and working out for a bit while I took time to cope with what I thought I had lost from MS,” said Jennifer. However, Jennifer’s love of Disney and desire to help other people with MS inspired her decision to join Team MSAA for the Walt Disney World® Marathon Weekend. “I realized that I had not lost anything,



*Jordan Amor will participate in the Walt Disney World® Marathon Weekend 10K in honor of her father, who has multiple sclerosis.*

## A RUNNING ROLE MODEL

When Jordan Amor was in middle school, her father was diagnosed with MS after some bouts of numbness in his legs. “As a young middle schooler, I had no idea what this meant – but shout-out to my awesome parents who walked me and my younger siblings through it all,” said Jordan. Currently, Jordan works as a teacher and strives to let her students know the importance of helping others, who, just like her father, fight battles that are invisible to most other people. With the influence of her dad, and her desire to be a role model for her students, Jordan laced up her sneakers and joined Team MSAA for the Walt Disney World® Marathon Weekend 10K! Jordan’s been working hard to train for her very first 10K in Walt Disney World® – she’s even coaching a local cross-country middle school team, which has motivated her to grow as a runner, increase her mileage, and improve her mental



toughness before the big race day. Of course, Jordan’s dad also remains a source of motivation for her race with Team MSAA. “My dad has always been my number one fan, coach, and so much more – he has never let that diagnosis stop him.”

I already had MS while running before, and I could still run now,” said Jennifer. To prepare for her half marathon with Mickey, Jennifer has mostly been training alone, but her fundraising for MSAA’s free programs and services has been a team effort. Jennifer has implemented a “training run-a-thon” where friends and family pay for Jennifer’s miles as she trains, which

helps her to rack up donations. For those with MS who are interested in becoming future members of Team MSAA, Jennifer has some words of wisdom. “Listen to your body, but don’t be afraid to challenge your body and to challenge yourself. Remind yourself that you are an MS warrior and battle on, you are worth the fight. You got this.”



## TEAM DRAGONFLY DIVES BACK INTO ACTION

In July, one of MSAA's avid supporters jumped back into the pool to raise awareness for a cause that is close to her heart. Courtney Evers, captain of Team DragonFLY, embarked on her fifth Swim for MS challenge with the help of her teammates, and raised more than \$6,000 in support of MSAA's free programs and services!

Courtney started her annual Swim for MS challenge five years ago in honor of her mother, Elaine, who was diagnosed with MS in 2005. Each year, friends and family of Courtney and Elaine (who live all over the country!) sign up to swim and fundraise. This year, Team DragonFLY had 16 members participating from coast to coast!

Courtney and Team DragonFLY's initial fifth anniversary goal was to swim a combined 50 miles in five days with the hope of raising \$5,000 – not only did the team exceed their fundraising goal, but they also exceeded their mileage goal by swimming a collective 100 miles amongst team members within five days! "I couldn't have had such great success without the incredible team swimming alongside me, and the over 90 people that donated to the cause this year," said Courtney. "It's amazing to see how much this event has grown since our first one in 2011, and it makes my heart so happy when a friend asks when our next event is! It's a lot of work, but it's so worth it – especially being able to support my mom, Elaine."



*(left to right) Elaine Buis, Ruth Evers, and Courtney Evers paddle in their local pool for Team DragonFLY's fifth Swim for MS challenge!*



For people with *multiple sclerosis* (MS)

# Learn about a new *brain-first perspective* of MS

When it comes to MS, the brain is truly key, and new thinking focuses on keeping it healthy.

## What do we know about the brain & MS?

- New research shows that certain lesions have a greater impact on MS than once believed
- The brain can adapt to lesion damage—and you can help
- A healthy lifestyle can help you manage MS symptoms



## *the MS* MindShift

See how a new perspective can help you preserve your brain and its function.

[MSMindShift.com](https://www.MSMindShift.com)



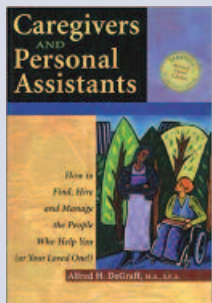
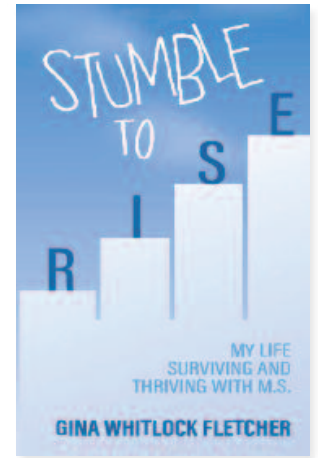
# Moving Forward in the Face of Obstacles

## Stumble to Rise: My Life Surviving and Thriving with MS

by Gina Whitlock Fletcher

Rise Up Publishing | MSAA Book #434

This book tells the story of how author Gina Whitlock Fletcher has struggled, taken control, and maintained a mostly joyful perspective in spite of the daily challenges she faces since being diagnosed with multiple sclerosis 23 years ago. For all those who are struggling to overcome what may be devastating realities in their lives, Gina hopes to inspire them to keep moving forward. Within just a few days of launching her book in March 2019, *Stumble to Rise* hit the Amazon bestseller list in the MS category. Examples of chapter titles include “The Adventure Begins,” “Building a Toolbox,” “Getting Behind the Wheel,” and “Time to Rise.”

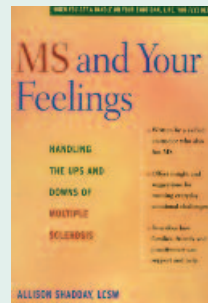


### Caregivers and Personal Assistants

by Alfred H. DeGraff

A helpful guide on how to recruit, screen, and manage the people who assist you or your loved one.

MSAA Book #391

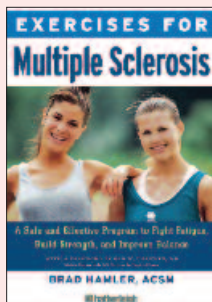


### MS and Your Feelings

by Allison Shadday

The author, a psychotherapist and MS patient, offers effective coping strategies for dealing with emotions. Includes a chapter for caregivers.

MSAA Book #370

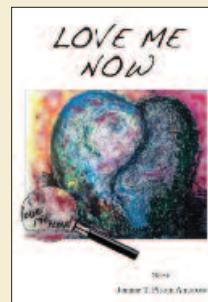


### Exercises for Multiple Sclerosis

by Brad Hamler

Easy-to-follow exercises to improve common symptoms, especially fatigue and mobility.

MSAA Book #351



### Love Me Now

by Joanne T. Amoroso

Guidance and encouragement for loved ones of chronically ill individuals. A 2019 International Book Award winner.

MSAA Book #432

To borrow books featured in this column or any other book in MSAA's Lending Library, please visit [mysaa.org/library](http://mysaa.org/library) to view a list of books available and to complete a form. When ordering a book, please reference the book number listed. Readers may also call MSAA at (800) 532-7667 for more information. MSAA and its clients greatly appreciate any donations made to help build the Lending Library.



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**Submit Your  
Best Work for  
MSAA's 2020**

# Art Showcase

We are now accepting submissions for the **MSAA Art Showcase!**

MSAA welcomes paintings in oil, watercolor, and acrylic, as well as pastels and drawings in pencil and ink. **NEW FOR THIS YEAR:** MSAA is also accepting digital artwork, including graphic design and photography.

Artwork will only be accepted from individuals who have MS and are 18 years of age or older. Submitted pieces must be two-dimensional. Sculpture, pottery, fabric, and other types of three-dimensional works cannot be accepted. You may submit up to five (5) pieces of your artwork for the showcase.

Submissions will be featured on MSAA's website beginning March 2020 in recognition of MS Awareness Month. Each month we will highlight one artist and his or her work.

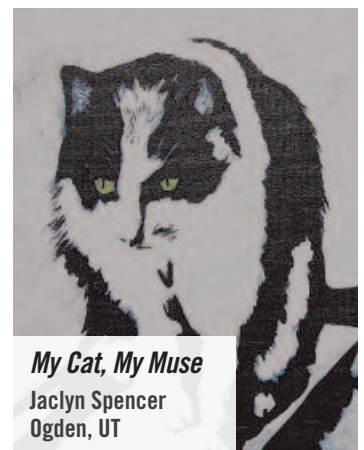
**Submissions will be accepted  
until December 16, 2019.**

For submission guidelines, please visit  
[support.mysaa.org/artshowcase](http://support.mysaa.org/artshowcase)

**For more information, contact:**

MSAA's Art Showcase  
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Email: [showcase@mysaa.org](mailto:showcase@mysaa.org)  
Phone: (800) 532-7667, ext. 117



**My Cat, My Muse**

Jaclyn Spencer  
Ogden, UT



**Surfer**

Hope Angel  
Hillsboro, OR



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