

The MS Prodrome

Early Clues to MS Before Diagnosis

What Can We Learn from the MS Prodrome?



TABLE OF CONTENTS

- | | |
|---|---|
| 2 NARCOMS Info Corner | 9 MS News Updates: High-Dose Biotin Trial; MS Prodrome Studies |
| 3 Letter from the Director | 13 Special Update: COVID-19 Vaccine Advice for People with MS |
| 4 Feature Focus: New Information About the MS Prodrome | 15 Crossword: The MS Prodrome |
| 8 MS Messenger | |



INFOCORNER



What is NARCOMS?

NARCOMS is a registry for people who have multiple sclerosis (MS). Registry participants complete two surveys each year to provide information about themselves and their experience living with MS. Data from these surveys are used in research studies and to help further our understanding of MS. Participation in the registry is voluntary, and responders' identity and privacy are carefully secured.



What is the Goal of NARCOMS?

The NARCOMS Global MS Patient Registry helps to facilitate research about multiple sclerosis in North America and around the world. Collaboration between MS centers of excellence throughout the world helps to increase knowledge, improve clinical care, and enhance the quality of life for persons with MS.



How Private Is My Information?

We will keep the information that you provide us private and confidential by storing your data in a secure database. All information will be used for research purposes only. We do not share any personally identifying information with any person or research institution. We follow all Federal (HIPAA) laws regarding confidentiality.



Not Yet a NARCOMS Participant?

Please contact us at www.NARCOMS.org to enroll online, or call toll free at 1-800-253-7884.



Tell Us Your Thoughts!

Have an idea? We would love to hear from you!
Send us your questions, comments, and suggestions.

Call: 1-800-253-7884 (toll-free U.S.)

Email: MSRegistry@narcoms.org

Online: www.narcoms.org/contact-us

This publication is supported by grants from:



Robert Fox, MD

Managing Director

Ruth Ann Marrie, MD, PhD

Scientific Director

Amber Salter, PhD

Coordinating Center Director

Gary R. Cutter, PhD

Scientific Advisor

Michele Curran

NARCOMS Project

Manager

Katherine Wandersee

Medical Writer

James Ticchio

Creative Director

Joseph J. D'Onofrio

Frank Marino

Delaware Media Group

Publishers



NARCOMS is a project of the Consortium of Multiple Sclerosis Centers (CMSC).

For more information on the CMSC visit

www.ms-care.org.

NARCOMS Now acknowledges and appreciates the companies listed on the bottom of page 2, which have provided unrestricted educational grants through the Foundation of the CMSC toward production costs of NARCOMS Now, including printing and mailing. None of these companies have any control or influence over the content of NARCOMS Now. They are not provided access to NARCOMS data in return for their support. For any questions regarding NARCOMS Now funding please call 1-800-253-7884.

DIRECTOR'S LETTER

Dear NARCOMS Now Readers:

In this issue of *NARCOMS Now*, we focus on the MS prodrome. A prodrome refers to early signs or symptoms of an illness before typical symptoms start. Recent research has indicated that a prodrome stage likely occurs in MS, and this knowledge may be important in the early detection and treatment of MS.

In our Feature Focus section, we discuss the prodrome with Dr. Helen Tremlett at the University of British Columbia. Dr. Tremlett has described the MS prodrome based on health system patient contact data. She has suggested that understanding the MS prodrome might lead to an earlier diagnosis of MS and improved treatments and outcomes.

The MS News section provides information concerning the results of a clinical trial testing of Biotin, a B-complex vitamin, as an MS therapy. It also talks about the potential use of a blood test as a biomarker of the MS prodrome. Finally it also looks at a study assessing use of certain medications as an indication of a prodromal stage in MS.

We have deviated from the usual SnapShot of NARCOMS survey results so that we can provide specific information about the recently approved COVID-19 vaccines. Dr. Nancy Sicotte, Director of the MS and Neuroimmunology Program at Cedars Sinai Medical Center, answers common questions about the use of the COVID-19 vaccines in people with MS. We hope that this is helpful as you begin to discuss these vaccines with your health care providers.

We thank you for your continued participation in the NARCOMS registry! Your involvement in this registry is critical in advancing our knowledge of MS. We also want to reiterate the importance of wellness during these difficult times and to follow safe practices during this pandemic.

Sincerely,

Ruth Ann Marrie, MD, PhD
Scientific Director, NARCOMS



Ruth Ann Marrie,
MD, PhD



The MS Prodrome: Early Signs and Symptoms Signaling Possible Onset of Multiple Sclerosis

Anna, now 50 years old, was diagnosed with multiple sclerosis (MS) at age 36. The first symptoms she noticed were vision changes and numbness in her right leg that caused her to stumble. A primary care doctor sent her to a neurologist, who conducted an exam and MRI. “They told me this was a clinically isolated syndrome. That meant it was my first clinical, or detectable, episode of MS,” she said. Anna always believed that her MS began with that one event many years ago. However, MS may reveal itself years earlier than that first event, with more subtle signs or symptoms that are not as typical. This early stage, before the typical signs and symptoms of MS present, is called a “prodrome.” Recent research shows that a prodrome is likely present in MS.

What is a Prodrome?

A prodrome is present in many neurologic conditions. It is defined as “early symptoms prior to the onset of a disease or illness.” In a person with migraine, the prodrome might be sensitivity to light, or nausea, which signal that a headache is about to start.

Helen Tremlett, PhD, is Professor of Medicine (Neurology) at the University of British

“The classic early manifestations of MS include blurred vision or numbness or weakness in the limbs. However, the MS prodrome often involves other types of symptoms.”

— Helen Tremlett, PhD, Professor of Medicine (Neurology) at the University of British Columbia in Vancouver

Columbia in Vancouver. She is affiliated with the Djavad Mowafaghian Centre for Brain Health. She also serves as the Canada Research Chair in Neuroepidemiology and Multiple Sclerosis. Dr. Tremlett has conducted a series of studies to explore the MS prodrome, to find out what it can tell us about the early diagnosis and treatment of MS. “The classic early manifestations of MS include blurred vision or numbness or weakness in the limbs,” Dr. Tremlett told *NARCOMS Now*. “However, the MS prodrome often involves other types of symptoms,” she said. Because these symptoms are more general and have many possible causes, they typically do not trigger a workup for MS.

Dr. Tremlett’s research team examined health records of 14,000 Canadians with MS from the

years 1984 to 2014. They compared them to the health records of 67,000 people without MS. In the five-year period before their first signs of MS, this research showed that people with MS were:

- Four times more likely to be treated for a nervous system disorder, such as pain or sleep problems
- Twice as likely to see a psychiatrist
- Three times more likely to be diagnosed with fibromyalgia, a condition that causes muscle pain
- Twice as likely to have irritable bowel syndrome

Migraine headache and mood disorders—such as depression, anxiety, or bipolar disorder—

were more common in people who later developed MS.

Use of Healthcare Services During the Prodromal Phase

“Higher use of healthcare services seems to be an indicator of a prodromal stage of MS,” Dr. Tremlett said. Research shows that healthcare use rises steadily during this five-year period among people who later go on to develop MS. In comparison with the general population, in the five years before onset of MS symptoms, people with prodromal MS are:

- 78% more likely to be hospitalized
- 88% more likely to have visited a healthcare professional

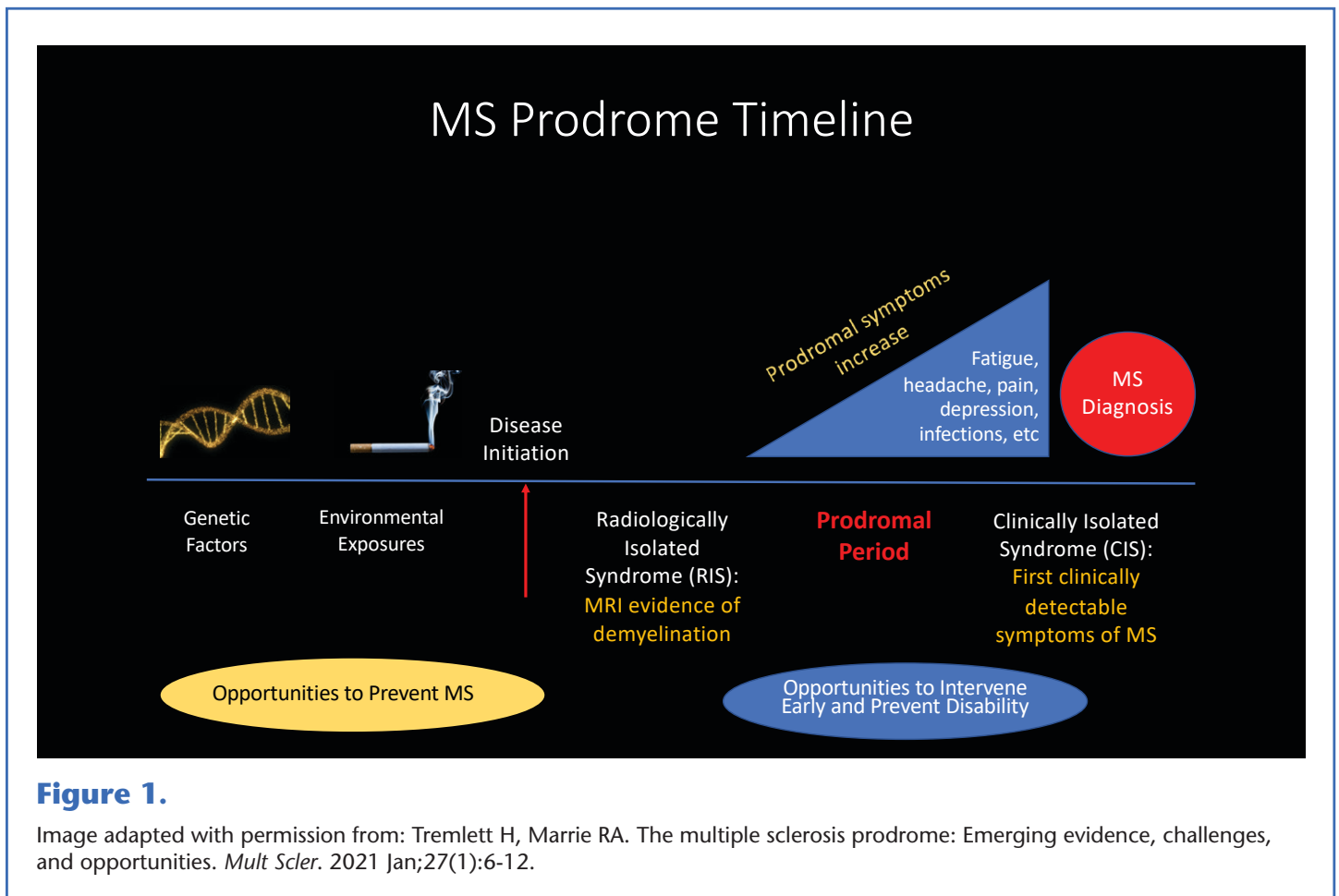


Figure 1.


Image adapted with permission from: Tremlett H, Marrie RA. The multiple sclerosis prodrome: Emerging evidence, challenges, and opportunities. *Mult Scler.* 2021 Jan;27(1):6-12.

- 49% more likely to have had a prescription filled

The likelihood of these events is even greater in the year just prior to the first clinical event of MS. Other studies have shown that performance on cognitive assessments is worse among young adults who go on to develop MS within the next two years.

MS Prodrome Gaining Recognition

Prodromes are well recognized in other conditions such as rheumatoid arthritis and Parkinson’s disease. In MS, little attention was paid to the idea of a prodromal phase until fairly recently. When Dr. Tremlett talks with people who have MS, many can reflect back on events that might have been signs of prodrome. “These stories and anecdotes have

 *“Increased knowledge of the MS prodrome could serve to advance MS care and research in several ways.”*

— Helen Tremlett, PhD, Professor of Medicine (Neurology) at the University of British Columbia in Vancouver

inspired us to pursue a rigorous and scientific assessment of the MS prodrome,” she said.

Brain lesions consistent with MS sometimes show up on a person’s MRI scan many years before they have any symptoms or even a glint of suspicion of having MS. In these cases, an MRI of the head or spine is usually ordered to evaluate or rule out other conditions, such as a concussion or migraine headaches. When a



SURVEY

Please take our survey.

- 1) Do you find this publication to be easy to read?
- 2) Is the content of *NARCOMS NOW* relevant to you?
- 3) What are your favorite sections of *NARCOMS NOW*?
 - Feature articles/interviews with experts
 - Summaries of key news/research in MS
 - Updates on how NARCOMS data are used in MS research
 - Word search puzzle
 - Q & A and tips for completing the NARCOMS surveys

- 4) What topics would you like to see covered in future issues of *NARCOMS NOW*?
- 5) General Comments about *NARCOMS NOW*



Go to: <https://is.gd/NARCOMSNow> or scan the QR code.

person has MRI evidence of MS, but no other signs of the disease, this is called “radiologically isolated syndrome” or RIS. RIS can occur in adults or children and may be identified five or even as long as 10 years before clinical signs of MS develop.

How Does Research on MS Prodrome Help the Study of MS?

“Increased knowledge of the MS prodrome could serve to advance MS care and research in several ways,” Dr. Tremlett noted. Further study of the MS prodrome could tell more about what happens in the earliest stages of MS. Eventually, this may help unlock the mystery of what causes MS. Treatments could be started before damage to the nervous system is advanced.

Early diagnosis of MS has been shown to be a key factor in improved treatment and outcomes. Could identifying an MS prodrome lead to even earlier diagnosis? “Maybe someday,” Dr. Tremlett said, but not until more is known. Right now, the MS prodrome is an important topic for research only. “There is not sufficient evidence to make practical recommendations about the MS prodrome for clinical practice,” she stressed. “That might be a future goal, but we are not there yet. The vast majority of signs and symptoms we have found as part of the MS prodrome are also common in the general population and have many causes (e.g., fatigue, anxiety, and depression). Overinterpretation of our research findings could result in unintended harm, such as over-testing (too many inappropriate tests), overdiagnosis of MS, or misdiagnosis. This may actually cause unnecessary cost, worry, or anxiety.”

THE MS PRODROME

WHAT DO WE KNOW ABOUT MS PRODROME?

EARLY SIGNS MAY INCLUDE PAIN, FIBROMYALGIA, MOOD DISORDERS



HIGHER USE OF CERTAIN PRESCRIPTION DRUGS

HIGHER RATES OF HOSPITALIZATION AND HEALTHCARE USE



BLOOD BIOMARKERS MAY SHOW EARLY NERVE CELL BREAKDOWN

PRODROME MAY BEGIN 5 OR MORE YEARS BEFORE FIRST CLINICAL SIGNS OF MS



RESEARCH ON MS PRODROME MAY HELP UNCOVER THE UNDERLYING CAUSES OF MS



MSMESSENGER

Feedback Welcome

We welcome your comments or suggestions about the *NARCOMS Now* magazine. If there is a topic you would like to see reported please let us know. We always appreciate feedback from our valued survey participants!

Take Care of Yourself

We understand that the past year has been difficult for many of us. If you are experiencing any new or troubling symptoms, physically or mentally, please contact your medical provider. Stay healthy and well. Spring is on the way!

Update Your Contact Info

With the new survey coming soon we gently remind you to update your contact information with us. You can do that by calling us at (800) 253-7884 or by email at msregistry@narcoms.org.

Spring 2021 Survey

Believe it or not, we are already preparing the Spring 2021 update survey. We will be including some new questions about immunizations and fatigue. We have asked about fatigue questions in the past, but it has been a while. We look forward to reporting how things have changed (or remained the same) over the years.

Survey Access Update

A refresher for those who complete your surveys online, you no longer need to go to the NARCOMS website to access your surveys. You do not need a login username or password. A link to your individual survey is emailed to you. You can click on that link to access your survey. If you need to take a break, you can use the “save and return” function and a return code will be emailed to you.

www.narcoms.org



Recent Trial of High-Dose Biotin in People with Progressive Multiple Sclerosis Shows No Benefit in Improving Disability

Biotin is a B-complex vitamin, and is also known as vitamin H. B vitamins play important roles in converting food to energy. The suggested biotin dose for adults is between 3 and 100 micrograms (mcg) per day. However, recent research has explored whether a very high daily dose of biotin might have a disease-modifying benefit in multiple sclerosis (MS).

A much-awaited Phase 3 trial in people with MS showed that high-dose biotin (MD1003) did not improve neurologic function. Bruce Cree and fellow investigators enrolled 642 people with either primary progressive or secondary progressive MS. About half of the participants received oral biotin at 100 milligrams (mg) three times daily. This is about 300 times the usual recommended dose. The other half of participants received a placebo. Participants were allowed to use other disease-modifying medications. Trial participants had moderate disability and needed to be able to walk either with or without assistance. They also had clinical signs of disability progression and had no relapses in the two years before entering the study.

After 15 months, disability improvement was similar in biotin-treated and placebo patients.



Adverse event rates were also similar in the biotin and placebo groups. However, high-dose biotin use does interfere with some laboratory tests. They concluded that “[Biotin] did not significantly improve disability or walking speed. . .and thus. . .**cannot be recommended for treatment of progressive multiple sclerosis.**” While the findings of this trial are disappointing, other clinical trials of therapies for progressive MS are ongoing. Furthermore, this trial provides a definitive – albeit disappointing – answer to the question about the potential usefulness of biotin in progressive MS.

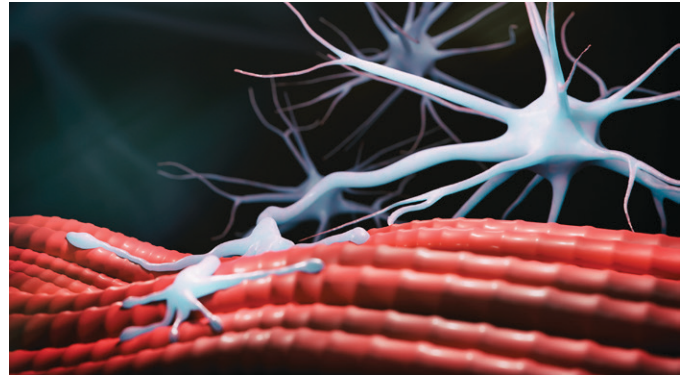
Reference: Cree BAC, Cutter G, Wolinsky JS, et al. Safety and efficacy of MD1003 (high-dose biotin) in patients with progressive multiple sclerosis (SPI2): a randomised, double-blind, placebo-controlled phase 3 trial. *Lancet Neurol.* 2020;19(12):988-997.

Blood Marker of Nerve Cell Breakdown Shows Prodromal Stage of MS May Last 6 or More Years

Blood tests or other laboratory tests that reflect changes in disease status are much needed in multiple sclerosis (MS). In MS and other diseases, scientists are starting to find biomarkers in blood or cerebrospinal fluid (CSF). CSF is the fluid that surrounds the brain and spinal cord.

Neurofilaments are potential biomarkers of great interest in MS. Neurofilaments are proteins that make up the building blocks of the nerve cell. When nerve cells die, these proteins enter the CSF and, later, the bloodstream. In MS, the most studied is a type called neurofilament light chain (NfL). Higher NfL levels (indicating more nerve cell breakdown) have been associated with cognitive problems, changes or new lesions on MRI, and progressive MS. Researchers are looking at how changes in NfL levels may inform us about responses to MS disease-modifying therapies. Higher NfL levels are not unique to MS. In fact, NfL levels are elevated in other neurologic conditions and with older age. This indicates that NfL levels in blood should be interpreted carefully.

Researchers from the Harvard School of Public Health looked at NfL levels in blood samples taken from military personnel between 2000 and 2011. This included 60 persons who later developed MS. They found increased NfL levels in the 6-year period before these individuals had their first symptoms of MS. “This demonstrates a prodromal, or pre-clinical,



phase of MS that may go on for several years before diagnosis,” the authors stated. Further studies evaluating NfL in MS are under way by many researchers around the world.

Reference: Bjornevik K, Munger KL, Cortese M, et al. Serum neurofilament light chain levels in patients with presymptomatic multiple sclerosis. *JAMA Neurol.* 2020;77(1):58-64.

Higher use of some medications may indicate a prodromal phase of MS

A prodrome is a term for early signs or symptoms of a health condition which begin before the more typical symptoms of that condition develop. A group of researchers from the University of British Columbia and other universities across Canada studied what happens in the five years before a diagnosis of multiple sclerosis (MS). They used data from a large healthcare database over an 18-year period. The data included over 4,800 people with MS and over 22,000 people without MS. The researchers identified higher use of certain medication classes in people who later developed MS. These included:

- Glucocorticoids (steroids)
- Muscle relaxants
- Anti-epilepsy medications

- Anti-anxiety medications
- Drugs to control muscle spasms in the bladder that lead to feelings of “urgency”

In the five years before their diagnosis, people with MS were much more likely to have a prescription filled for one of these drug categories. The research team thought that these patterns showed evidence of a prodromal phase in MS that leads to higher use of these medications.

Reference: Zhao Y, Wijnands JMA, Hogg T, et al. Interrogation of the multiple sclerosis prodrome using high-dimensional health data. *Neuroepidemiology*. 2020;54(2):140-147.

Primary Progressive, or Secondary Progressive MS? It’s Not Always Easy to Distinguish

The difference between primary progressive multiple sclerosis (PPMS) and secondary progressive MS (SPMS) is not always straightforward. “Diagnosing PPMS can be challenging,” explained NARCOMS Managing Director Robert J. Fox, MD. “There really are no clinical, immune system, or cellular signs that can help us to tell the difference between PPMS and SPMS,” he said.

Magnetic resonance imaging (MRI) offers several clues. In December, Dr. Fox coauthored a review article in *JAMA Neurology* with a group of distinguished MS specialists. This article summed up what is known about MRI signs in progressive MS and what is still unknown.

Among the main points:

- Spinal cord MRI may show some signs that are typical of PPMS. The location of lesions in the brain and spinal cord are key.

- Lesions found in the infratentorium, a region near the back of the brain, or in the brain’s gray matter, may help predict how fast a person’s MS will progress.
- The amount of inflammatory activity on MRI over time is also factored in.

In SPMS:

- Demyelination in certain regions, and a distinctive lesion called a “slowly expanding lesion” can signal progressive MS.
- A person’s age and other medical conditions may play a role in how brain and spinal cord lesions evolve.

“To better diagnose progressive forms of MS, we still need better MRI markers that can distinguish PPMS from relapsing-remitting MS (RRMS),” Dr. Fox said. “We also need MRI markers that can help us predict when RRMS starts to transition to a progressive phase. It is important for people with MS to be aware that there can be some overlap and lack of clarity between these forms of MS.”

Reference: Filippi M, Peziosa P, Barkhof F, et al. Diagnosis of progressive multiple sclerosis from the imaging perspective: a review. *JAMA Neurol*. Published online Dec 14, 2020. doi:10.1001/jamaneurol.2020.4689.



Support Programs for MS Disease-Modifying Therapies (DMTs)

Aubagio[®], Genzyme Corporation:
www.aubagio.com, 855-MSONE2ONE (855-676-6326)

Avonex[®], Biogen:
www.avonex.com/en_us/home/above-ms-program/join-biogen-support.html, 800-456-2255

Betaseron[®], Bayer HealthCare:
<https://www.betaseron.com/why-betaseron>,
844-788-1470

Copaxone[®], Teva Neuroscience:
<http://copaxone.com/AboutSharedSolutions.aspx>,
800-887-8100

Extavia[®], Novartis:
www.extavia.com/info/PatientSupport/patient-support-program.jsp, 866-EXTAVIA (866-398-2842)

Gilenya[®], Novartis:
www.gilenya.com,
800-GILENYA (800-445-3692)

Glatiramer Acetate Injection, Mylan:
www.glatirameracetate.com/en/patient-support,
844-695-2667

Glatopa[®], Sandoz:
www.glatopa.com, 855-452-8672

Kesimpta[®], Novartis:
www.kesimpta.com, 855-KESIMPTA (855-537-4678)

Lemtrada[®], Genzyme:
www.lemtrada.com, 855-MSONE2ONE (855-676-6326)

Mavenclad[®], EMD Serono:
www.msllifelines.com, 877-447-3243

Mayzent[®], Novartis:
www.mayzent.com, 877-MAYZENT (877-629-9368)

Ocrevus[®], Genentech:
www.ocrevus.com, 844-OCREVUS (844-627-3887)

Plegridy[®], Biogen:
www.plegridy.com, 800-456-2255

Rebif[®], EMD Serono:
www.msllifelines.com, 877-447-3243

Tecfidera[®], Biogen:
www.tecfidera.com, 800-456-2255

Tysabri[®], Biogen:
www.tysabri.com/en_us/home/join-biogen-support/join-biogen-support.html, 800-456-2255

Vumerity[®], Biogen:
www.abovems.com, 800-456-2255

Zeposia[®], Bristol Myers Squibb:
www.zeposia.com/support-program-for-patients/,
833-937-6742

MS News, Support, and Self-Help Groups

Can Do Multiple Sclerosis
www.mscando.org

MS Views & News
<http://www.msviews.org/msviewsandnews4>

MS World
www.msworld.org

Multiple Sclerosis Association of America
<http://mymsaa.org>, 800-532-7667

Multiple Sclerosis International Federation
www.msif.org

Multiple Sclerosis Foundation
www.msfocus.org, 888-MSFOCUS (888-673-6287)

National Multiple Sclerosis Society
www.nationalmssociety.org, 800-344-4867



NARCOMS Q&A


COVID-19 Vaccine Questions and Answers

In this issue of *NARCOMS Now*, we have decided to forego the usual SnapShot of NARCOMS survey results to offer some information concerning the current COVID-19 vaccines and their use for people with multiple sclerosis. We have gathered common questions and submitted them to Dr. Nancy Sicotte, Professor and Chair of Neurology at Cedars-Sinai Medical Center in Los Angeles, California and the Director of the Multiple Sclerosis and Neuroimmunology Program. She is also Chair of the National Multiple Sclerosis Society's National Medical Advisory Committee and the COVID-19 vaccine task force. Dr. Sicotte has extensive experience in the structural and functional imaging of disease progression in multiple sclerosis, as well as cognitive impairment and depression in multiple sclerosis.




Nancy Sicotte, MD
Professor and Chair
of Neurology at
Cedars-Sinai Medical
Center in Los Angeles,
California

What COVID-19 vaccines have been authorized?


 Dr. Sicotte: So far, two vaccines have received emergency use authorization from the US Food and Drug Agency: Pfizer and Moderna

How do these new mRNA vaccines work compared to the more standard vaccines?


 Dr. Sicotte: These vaccines use new delivery technology to allow for the introduction of a small piece of messenger RNA (mRNA) into cells. Once there, this mRNA is translated into the spike protein of the virus, which triggers an immune response. The combination of the delivery system and the use of mRNA are unique to these new vaccines.

How long does it take for the vaccine to provide immunity


from the COVID-19 virus?

 Dr. Sicotte: The full 95% effectiveness is achieved after the 2nd vaccine is administered (3 – 4 weeks after the first vaccination). It takes about 14 days to develop some protection. There is about 70% effectiveness after a single vaccine shot.

Should my caregiver or loved ones get a COVID-19 vaccine?

 Dr. Sicotte: We hope that everyone who wants a vaccine will be able to receive it as soon as possible. Currently healthcare workers and nursing patients have been targeted for the first round of vaccines.

Will COVID-19 vaccines be safe for people with MS?

 Dr. Sicotte: The vaccine was not tested specifically in patients with MS, but

based on what is known about vaccinations in general for MS patients, as well as the data from the COVID vaccines obtained so far, the mRNA vaccines are thought to be safe for MS patients. In addition, considering the overall effectiveness of the vaccine and the risks associated with getting COVID, it makes sense to have the vaccine.

Q Will COVID-19 vaccines be safe with my current medications?

A Dr. Sicotte: Yes, there is no evidence that the vaccines interact with current MS medications.

Q Will COVID-19 vaccines affect my MS symptoms?

A Dr. Sicotte: Some MS patients may have a transient worsening of their MS symptoms after vaccination. For example, if a low grade fever can develop along with some muscle aches and fatigue. This is similar to what happens to people living with MS with any overheating or infection and does not indicate the presence of a new relapse.

Q I have heard how COVID-19 infection can lead to long-term health issues. Will the vaccine prevent those health issues?

A Dr. Sicotte: The vaccine is very effective in preventing infection with the virus and therefore would prevent those long-term health issues from ever occurring. In addition to the vaccine, using a mask and practicing social distancing are both effective in preventing infection and, therefore, subsequent long-term health issues that could arise from COVID-19 infection.

Q Can you explain herd immunity?

A Dr. Sicotte: Herd immunity is the situation in which enough individuals have either received a vaccine or have recovered from an infection so that the virus cannot be easily transmitted within a population. The numbers needed to achieve herd immunity are large; on average between 80-95% of the population would have to be immune. This is why it will take several months to reach that target to allow things to go back to pre-pandemic conditions.

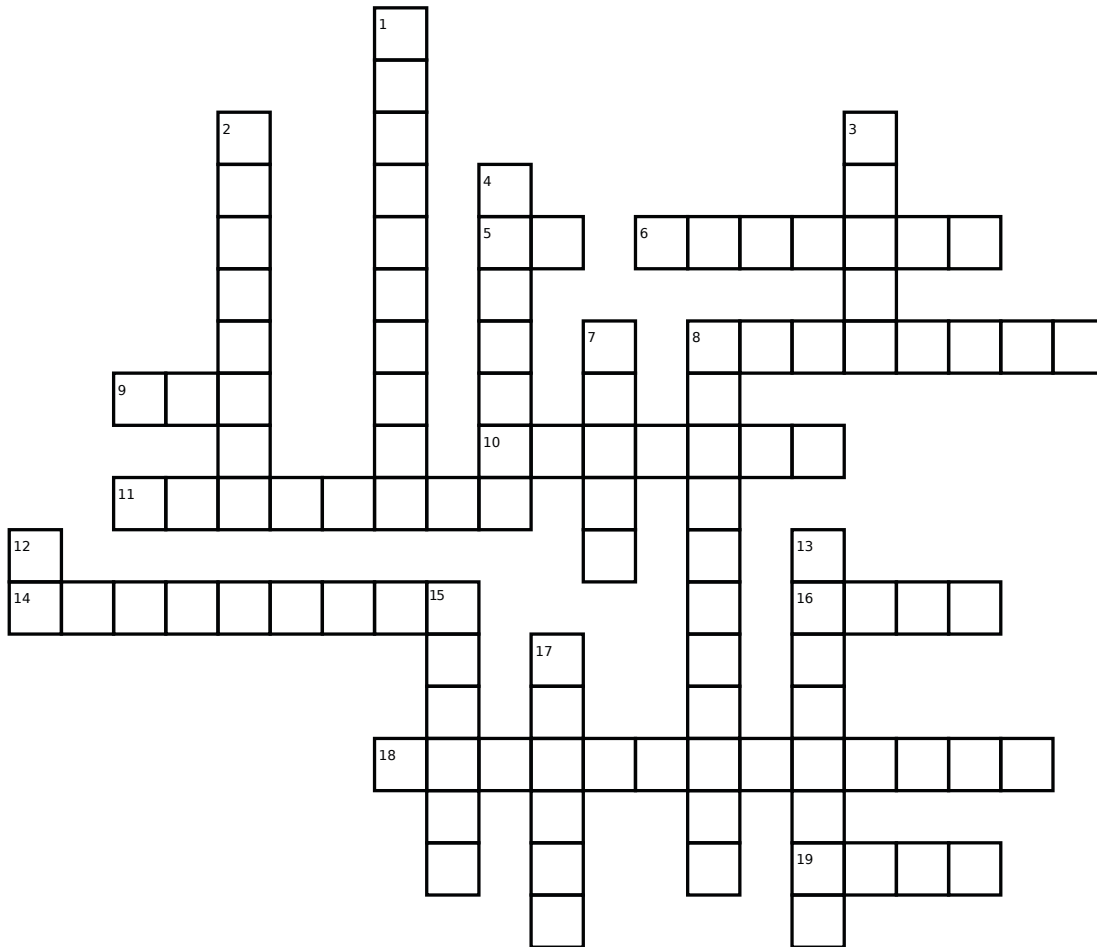
Q If I have had COVID-19, should I get the vaccine?

A Dr. Sicotte: Yes, but currently the recommendation is to wait 90 days after an infection prior to vaccination. This is because you have a least several months of immunity after infection, and to increase vaccine availability to those who are at higher risk of infection.



Play **CROSSWORD**

MS Prodrome



Down:

1. Use of this is higher during MS prodrome
2. Type of headache that often starts with a prodrome
3. MS is rare in this population
4. To stop something before it starts
7. MS prodrome may assist with diagnosis at this stage
8. Type of MS with few or no relapses
12. abbreviation for Parkinson's
13. Needed in order to learn more about MS prodrome
15. Making no noise
17. NARCOMS participants complete this regularly

Across:

5. abbreviation for a prescription
6. ____ of life: Priority among people with MS
8. Early stage of MS before diagnosis
9. Radiology study that shows brain changes in MS
10. Registry for people with MS
11. Canadian researcher involved in MS prodrome studies
14. Definite confirmation of a disease or illness
16. In-office way to evaluate MS symptoms
18. Blood test that shows brain cell breakdown
19. Ultimate goal for MS research

NARCOMS Coordinating Center
Washington University School of Medicine
660 Euclid Avenue
ST. LOUIS, MO 63110-9909

Non-profit Org.
U.S. Postage
PAID
Permit No. 1256
St. Louis, MO

NARCOMS NOW

BE PART OF NARCOMS—HELP TO ADVANCE RESEARCH IN MS

Whether you were recently diagnosed with multiple sclerosis (MS) or have lived with it for years, your personal history with the disease helps contribute to improving the lives of others with MS.

Participation in the NARCOMS registry allows you to be part of the process. The data provided by participants gives researchers a clearer picture of how a condition like MS impacts the lives of those affected.

Participation in NARCOMS is confidential—your information is kept secure and completely private. If you have MS and are not yet participating in NARCOMS, or have been out of touch for a while, we would love to hear from you! Contact us at 1-800-253-7884 (toll-free U.S.) or via email at MSRegistry@narcoms.org.



twitter: @narcoms
instagram: @narcoms_now

For more information on the CMSC visit www.mscares.org
www.NARCOMS.org