



## Multiple Sclerosis Association of America **Webinar Transcript**

**Program Title:** “What You Need to Know About COVID-19 and MS: Program 5”  
**Recorded On:** June 8, 2020  
**Presenters:** Barry Hendin, MD and Carrie Hersh, DO, MSc  
**MSAA Host:** Peter Damiri

Peter Damiri: Hello and welcome to the Multiple Sclerosis Association of America's live webinar, What You Need to Know About COVID-19 and MS Program 5. I'm Peter Damiri, Vice President of Programs and Services for MSAA and your host for tonight's program.

On behalf of the MSAA and our presenters, we greatly appreciate the opportunity to keep you updated on this very important topic. And please know that we hope you and your family are staying safe and healthy in these uncertain times.

MSAA is extremely honored to welcome back our two MS expert advisors who will update us about the Coronavirus pandemic and its impact on MS and to answer your questions during our expanded Q&A session. At this time, I would like to introduce our special guest presenters, Dr. Barry Hendin and Dr. Carrie Hersh.

Dr. Barry Hendin is MSAA's Chief Medical Officer and a practicing neurologist at Phoenix Neurological Associates. He is also the director of the Multiple Sclerosis Clinic at Banner University Medical Center and clinical professor of neurology at the University of Arizona's Medical School.

Dr. Carrie Hersh is the chair of MSAA's Health Care Advisory Council. She is a practicing

neurologist and assistant professor of neurology for the Cleveland Clinic Lou Ruvo Center for Brain Health in Las Vegas, Nevada.

Thank you both again for being here tonight and keeping us updated on this very important issue.

Dr. Barry Hendin: Peter, I'm sure I speak for Dr. Hersh in saying that we're both delighted to be working together again and also to join you and the people across the country who have expressed an interest in learning more about COVID-19.

Peter Damiri: Thank you, Dr. Hendin. -Appreciate that. Before we begin, I want to take this opportunity to thank our supporters, Bristol-Myers Squibb, EMD Serono, Genentech, Novartis, and Sanofi Genzyme for making this webinar series possible.

As you may know, MSAA is a national non-profit organization dedicated to improving lives today for the MS community. In fact, today marks MSAA's 50th Anniversary as an MS advocacy organization. Listed here are just some of our many free programs available to people living with MS all across the country along with our updated information on COVID-19.

Also, please know MSAA has expanded our Helpline hours to 8:00 p.m. Eastern between Mondays and Fridays. To learn more about our services, please visit [MyMSAA.org](http://MyMSAA.org) or call 1-800-532-7667. And lastly, tonight's program will be archived to our website very soon.

Since we covered extensive information about the Coronavirus in earlier webinars, we have shortened tonight's overview to allow more time for Q&A which includes questions that were submitted in advance on the registration form as well as questions you can type into the chat box during tonight's program.

Also, if you are experiencing any technical issues, please type those questions into the chat box as well. So with all of that now covered, I am honored to once again introduce Dr. Barry Hendin who will start off tonight's program.

Dr. Barry Hendin:        So the first slide is really just an overview of Coronavirus or COVID-19. To set a context for those of you out there who have not participated in any of the prior programs, the first bullet point says that COVID-19 is a potentially serious inflammatory disease that targets the respiratory system and it's part of a large family of Coronaviruses, many of which have produced very mild symptoms including common cold.

When we say that it targets the respiratory system, don't believe that that is isolated to the respiratory system. So the presenting symptoms may be fever or cough much like another upper respiratory illness. Pneumonia later, the lower respiratory illness. So the presenting symptoms can be very, various including gastrointestinal symptoms, diarrhea, lots of alterations, sense of smell and taste, muscle aching.

So it's not one presentation fits all. Can be very, very diverse. The second bullet point says that having MS in of itself does not put you at greater risk for COVID-19. The risk factors really are more about age and comorbidity.

So if you have MS and/or severely debilitated, with difficult to breathing or clearing mucus, et cetera. Of course, there's some increased just because of that as there would be with any respiratory illness, but otherwise MS does not appear to be the driving factor in outcomes. It is more age, particularly over 65 or 75, comorbidity like uncontrolled hypertension or asthma or diabetes or cancer or kidney disease or cardiorespiratory disease, and also habits like smoking.

So the good news is that MS just not in and of itself creates greater risk, but that doesn't make you immune from the risk of comorbidities.

In the next bullet point is that although there are lots of opinions about - of the disease modifying therapies, the field has evolved from early recommendations about which agents were thought to be less at risk and more at risk.

I think the evolution has been to see that the agents that we're using do not appear yet to have a distinct risk profile that would make one of them unusable as opposed to the others. The nice thing is Dr. Hersh will speak of this too, I know, there have been registries one of which is COViMS. That's the American registry. There's an Italian registry. There's an English registry.

It looks like people with MS are a wide variety of disease modifying therapies are doing about the same as the general population. It doesn't mean we know the final answer. This has been around for about 6 months and we're still understanding and trying to understand what puts one person at risk, how we can reduce risk in another.

At this particular moment, the last bullet point says don't stop your disease modifying therapies. Don't change it without talking to your physician. Stopping some of the disease modifying therapies can lead to what we call a rebound or an increase in risk.

Therefore, any change with the one that you would make in conjunction with your clinician, we do not recommend based on current evidence that one or another of the medications could stop or change other than the way you would do it otherwise. That is to say the medication may not be tolerating or that isn't controlling MS.

With that overview, let me go to the questions that were asked that Peter put together for us before we open it to slide questions from people on the telephone.

So the first question I kind of answered. Are we more susceptible to getting COVID-19 if we're taking disease modifying therapies and do different therapies place us at greater risk for getting a recovery from the virus? The answer is based on current evidence, no.

And then if you said do we think that we know enough yet as having experienced COVID-19 for 6 months, the answer is we're still looking at this, but the encouraging signs, the encouraging early indicators are that people with MS do as well as the general population generally with the same comorbidities and age etc., and that there is no specific agent which has been shown to have more particular bad outcome.

So that was an issue, which we debated earlier on. Dr. Hersh?

Dr. Carrie Hersh: Thank you so much, Dr. Hendin, and I would also like to echo that I'm thrilled to be back for our fifth generation of this Webinar that I hope our viewers have found helpful and especially in a rapidly evolving situation. Hopefully they have been learning alongside with us. This is certainly a very different time and we have all been learning together.

So hopefully we'll be able to continue providing education and services to the community that folks find helpful. So to continue, the next question, can having primary progressive MS create a greater risk of severe illness if I get the COVID-19 virus?

And I think that this is a very interesting question. You know, at this point in time we're not aware

that having a particular phase of MS puts one at an increased risk of developing a viral infection, but more so as Dr. Hendin was alluding to, age and other comorbidities such as poorly controlled diabetes and obesity, chronic heart and lung disease, cancer, and other lifestyle choices such as chronic tobacco smoking, it certainly looks like these are the risk factors that certainly place patients at an increased risk of developing the COVID-19 virus and having a worst off time with it.

Folks who have primary progressive MS tend to be older and they may have more disability compared to younger patients with relapsing remitting MS and those who are older and have more irreversible disability may be at more risk of having trouble clearing secretions because they're not able to mobilize as well as other people who have a different phase of their condition or who are younger.

So those are the factors that I would place at increasing the overall risk of developing COVID-19 and maybe having a worst off time of it, but not necessarily a primary progressive MS disease course. Dr. Hendin?

Dr. Barry Hendin: Sure. Next question is - is it safe for me to access medical care and how do I stay safe if I or a family member returns to work? Let me take the first part.

I think it's been - first of all, yes, when it's necessary to access medical care, be that doctor visits or MRIs, blood work, infusions, we believe that those medical - those fundamentals of medical care really ought to be undertaken.

But that's where we're really seeing a change in the delivery of that. So 8 months ago virtually every doctor visit was - every clinician visit or doctor visit were the face-to-face. I think we have recognized both of the fields of medicine and in particular with MS that we need to do more to

safeguard our patients.

And so that's why most visits across the U.S. and including most visits in my own practice are done by telemedicine, a way of keeping people safer. And what do we mean by that? They don't need to come into a medical setting. They don't need to come into a hospital. They don't need to come into a clinic unless necessary.

So there are a limited number of people who really do need to be seen face-to-face. We arrange for that to be done, but many people can have their visits by telemedicine.

The next one is how does one get to see the clinician, the physician, nurse practitioner, the PA. Public transportation can be difficult, all the more reasons to try to find safer forms of transportation. It also makes me ask the question about a particular MRI or that particular blood work and that is was this one really necessary or was it being done as a matter of just a rigid routine.

So it does make me have to ask questions each time about how do I maintain greater safety for the people in my practice. That means both the people with MS, but also staff. And then the same thing about family or returning to work and there it comes down to the basics. And so you'll see forever discussions about very esoteric things about lymphocyte counts, or whether one medication is more immunosuppressive or less immunosuppressive. The fundamentals are unchanged and that is social distancing, wearing a mask, hand washing, not touching your face. I know it sounds a bit (that is) too fundamental, too common sense, some fundamental as to be ignored. Don't ignore it.

If you go out, if your family member goes out, remember the common precaution. Hand washing. Wearing a mask. Social distancing. Not touching your face, et cetera. I'll repeat it as many times as I need to because those are the fundamentals. Dr. Hersh?

Dr. Carrie Hersh: Thank you so much. So the next question is I'm concerned my lymphocytes are low. Can this increase my risk for contracting COVID-19? And I also think that this is a very important question that has certainly been at the forefront of topics not only among the folks who are living with MS and their caregivers, but also MS providers alike.

And in trying to determine whether or not there is a linear correlation or direct correlation between people who are on medicines that lead to low lymphocyte counts or white blood cell counts and whether or not that increases the risk of developing a respiratory infection.

And, you know, generally speaking, we have not been able to showcase that any specific disease-modifying therapy as a whole is causally related to an increased risk of developing COVID-19 and having a worst off time of it.

Now, that's not to say that monitoring lymphocyte counts are not important because it certainly is. And there are certain disease modifying therapies where lower lymphocyte counts than what is expected to be in the normal range is actually the mechanism of action of how the disease modifying therapy works and is expected.

But in other disease modifying therapies, having lower white blood cell counts or low lymphocyte counts seem more to be an adverse effect as opposed to a mechanism of how the medicine works in safeguarding against more MS disease activity.

So it really does depend on a disease modifying therapy and what we consider to be acceptably low versus not acceptably low. And again, this is encouraging our patients and our caregivers to make sure that folks are being observed on their particular disease modifying therapies and having open



communications with our MS health care provider any concerns there are.

What I also seem to think is that folks who have other health care risk factors, those who have uncontrolled vascular comorbidities, and we have listed several of those, those who are chronic smokers, those who are older, those who are more sustainable, they may have an increased risk if their lymphocyte counts are on the lower side compared to other individuals who are otherwise very health individuals who have lower lymphocyte counts.

So it's really taking the entire individual as a whole and individually deciding whether or not that particular disease modifying therapy needs to be monitored more closely. And again, we emphasize the importance of not discontinuing a disease modifying therapy without first seeking with the MS health care provider and in the shared decision-making format developing a plan that everyone feels comfortable in following with. Dr. Hendin?

Dr. Barry Hendin: Sure. This one I think I might be able to speak simply is that how can you tell the difference between MS issues and COVID-19 issues? On the surface they're very different diseases. So COVID-19 is an acute or sub-acute often or febrile feverish problem with coughing or change in sense of smell, change in sense in taste, et cetera.

I feel sometimes like a simple flu. Some people don't have any symptoms whatsoever, but when the symptoms do occur, they're the symptoms of a febrile illness. That's quite different from MS and those of you on the phone line know that MS does not present generally with those same set of symptoms and that is to say fever, cough, et cetera.

I suppose where the lines become blurry is if a person has COVID-19 and a fever, couldn't their MS act up and make it in terms of a pseudo relapse and that is the worst thing that people feel with any

kind of fever, the worst thing that people with MS have with any kind of general illness.

So if one gets COVID-19, I expect them to feel a bit worse both with respect to their MS or COVID-19 and potentially with their MS due to fever. But the presentations are very, very different.

Dr. Hersh?

Dr. Carrie Hersh:           Okay. The next question. What would you say for people with MS to take a COVID-19 treatment or vaccine once these are developed? And, you know, again, all of these questions are very important and some of them we have great insight and answers to and others it's really on a wait and see approach and I think this question is really following the latter.

Right now, we currently do not have a vaccine -- which everyone on this call I'm sure is aware of -- and COVID-19 treatments are still being tested out. There have been some treatments that do look promising such as Remdesivir and convalescent plasma, which is essentially taking the plasma from someone who has been infected and recovered from COVID-19 developing antibody response and essentially donating those antibodies to another individual who is sick, and those treatments are actually looking promising.

In terms of vaccines, obviously we don't have a vaccine yet, but there are currently many different clinical trials that are currently ongoing to test the safety and effectiveness of these potential vaccines. Currently, in terms of vaccines at large, we do feel that inactivated or dead vaccines tends to be safe in people who are living with MS such as the seasonal flu vaccine, but other vaccines such as live, attenuated vaccines may be a little bit questionable depending upon the disease modifying therapy that the person is taking and the safety of having a live attenuated vaccine really needs to be weighed in terms of risk benefits with the MS health care provider.

So really there needs to be seen whether or not the vaccine that will ultimately be approved by the FDA and used commercially will be a wide-attenuated or an inactivated or dead vaccine. And if it is the latter, then I think for the most part it should probably be safe in people who are living with MS.

This question, however, is someone's response to the vaccine whether or not they'll be able to mount an appropriate immune response to a vaccine to safeguard the individual from developing the COVID-19 infection later.

And right now, we don't have a clear idea of whether or not the vaccine is going to be a one-time vaccine or if it's going to need to be given in multiple series or if it's going to be a seasonal vaccine very similar to the influenza or flu vaccine, and that is what we don't know.

But what we do know is that there are certain disease modifying therapies that do deplete part of the immune system that may impact one's ability to mount an appropriate response to a vaccine. And so what we expect is when a vaccine is finally approved that there will be real-world studies looking at the safety and effectiveness of providing a COVID-19 vaccine to individuals on certain disease modifying therapies to see if there is a blended response.

So again, it is going to be a watch and wait, you know? Currently, things are rapidly evolving, but, of course, we'll continue to keep the MS community informed and educated as we learn more information along the way. Dr. Hendin?

Dr. Barry Hendin: Sure. So Peter and Dr. Hersh both know that I tend to quote Bob Dylan a bit and the line that I use is a line from the, "The times, they are changing." Dr. Hersh used the term, "watch and wait." I take the line from the times they are changing which is don't speak too soon for the wheel is still in spin meaning it's still too early to give final answers to some of the questions being

asked, but what we're trying to do, Dr. Hersh and I, is to give the best answers we can at this moment knowing that the next time we're on the line with each other, the next time we speak to our patients, the information may be greater and therefore, our answers may be more sophisticated and more certain.

But to the next question, how many times can a person be infected with COVID-19? So this is similar to the question that Dr. Hersh answered and that's about immunity. We know that for the Coronaviruses in general, there is an immunologic response which protects that person for a period of time thereafter.

We know that immunity -- that is immunity you get when you get the infection -- may be partial or total, but it's not - but it may be - it may not be complete protection. And then number two is generally doesn't last forever.

So to the question, how many times can a person be reinfected, I would answer is very similar to the way that Dr. Hersh answered in a previous question, based on current evidence it looks like having gotten COVID-19 gives you some degree of immunity, maybe not complete, but some degree of immunity so that for a period of time you have protection or partial protection against reinfection.

How long that will last is uncertain. Will it be a year? Will it be two or more or less? That's what is still an unknown, but we may find ourselves in that cape going back to the need to deal with the COVID-19 or a mutation of our current COVID-19 because it is a rapidly changing virus with seasonal protection and that is to say having it and getting over it is good and gives you partial protection for a while, probably not permanently, probably not completely. We'll visit it again once we know more. Dr. Hersh?

Dr. Carrie Hersh:           Okay. The next question: If I contract COVID-19, will this have a long-lasting impact on my MS? And I would like to start by not quite answering this particular question, but providing some reassuring in terms of what we are now understanding about folks who are living with MS to develop COVID-19, what their overall response is.

And I'm actually taking this from the COViMS data -- which stands for COVID-19 Infections and MS and related diseases -- and this is a cooperative effort between an actual MS society to CMSC, the Multiple Sclerosis Society of Canada and this is a North American registry that are currently corroborating data from all across different MS centers and general neurologists alike on the prevalence of COVID-19 among individuals who are living with Multiple Sclerosis.

And I am happy to report that out of 260 individuals with confirmed MS who were reported as having contracted COVID-19, over 90% of those individuals have either recovered or are currently recovering and there's only a 5% rate of death among this particular cohort of individuals who have been reported.

So the vast majority of individuals with MS are doing fine after developing the infection and it doesn't look right off the bat that there is an increased mortality rate compared to the general population. And those individuals who tend to be more at risk, again, are those who are older and those who have other comorbidities that we had already talked about including cancer, cardiovascular disease, cerebral vascular disease, chronic kidney disease, chronic lung disease, high blood pressure, morbid obesity or who are smokers.

So this really aligns with the information that we were speculating towards the beginning of the outbreak based on the registry data that we currently have available to share with you all. Now,

going back to this question, if I contract COVID-19, will this have a long-lasting impact on my MS and I would say that overall this is likely not the case that the COVID-19 infection tends to be an infection - a respiratory infection that lasts for a certain period of time and most people have either recovered or are still recovering based on what we have in the COViMS registry.

In terms of a long-lasting impact on my MS, so Dr. Hendin had alluded to the fact that individuals who develop infections or fevers sometimes they can experience what we call a pseudorelapse, which means worsening of previous MS symptoms simply based on the fact that the core body temperature is raised and this seems to make the MS symptoms seem worse, but it's not actually causing any new inflammatory demyelination in the brain and the spinal cord. So this is very similar to what can happen with COVID-19 that someone may have a pseudorelapse but we currently are not seeing that COVID-19 in of itself it's having a separate impact on the long-term course of M.S. So I would say overall, no, I do not believe that entrapping COVID-19 will have a long-lasting impact on one's MS, which is very reassuring to say. Dr. Hendin.

Dr. Barry Hendin: Sure. The next question is I think a real live question. It's difficult for me to get to the grocery store. What are your thoughts about M.S. patients eating frozen and microwaveable meals? And so I think we're all in a new universe. And I would contend we're doing the best we can. That may mean that we are changing habits but that doesn't mean that we should lose track of wellness. And Dr. Hersh, in a moment will take over and talk about wellness that relates to social and psychological wellness and physical wellness. And this relates to some of that. So I would say there are still some basic rules and that is trying to maintain a proper body weight. It may be difficult in these times to get out and do the regular exercises that you were that you should. It may be difficult to get fresh vegetables but frozen vegetables have their own degree of nutrition and safety. My own view is do the best you can. Don't be overly hard on yourself. Atrophy, the general principle of wellness, and to the extent that how you eat plays a role in that. Maintain your body weight, try

not to lose track of that and gain because gained weight is bad for during COVID-19.

Number two, eat proportionally. Maintain fruits and vegetables and lean meat. It is a little more difficult to get them to modify but modify sensibly as part of general wellness. And so, with that is kind of a lead-in. Dr. Hersh, would you talk about I think the next slide, which is really about physical and emotional well-being and wellness.

Dr. Carrie Hersh: Yes, absolutely. And that was actually a fantastic transition into this very important topic. So the M.S.A.A. has been a very strong supporter of health and wellness and M.S. as a very important complementary strategy for long-term management of M.S. And we feel that the health and wellness components are increasingly even more important nowadays in this mix of a viral pandemic. So, most of what we have actually been encouraging our viewers is not different at all from what we have been encouraging our patients with M.S. for long term M.S. management. For those individuals who have already been strong supporters of remaining not only physically but mentally active and healthy, you're already in a great position in the middle of a viral pandemic.

So some of these things include getting plenty of sleep, being physically active, drinking plenty of fluids, really remaining well-hydrated, eating a nutritious and balanced diet, and, of course, managing stress. And, of course, you know, this is also in the wake of many other different challenging times that all around the world is currently being affected by and this is not just the COVID-19 pandemic, but learning how to manage stress is a very important tool here. And there are certainly a number of ways that folks can manage stress. And it really depends on the individual and what works for them. So in my experience, you know, picking up a hobby or picking up something that brings you joy can be a really strong and robust stress manager. But other people find other ways in order to reduce their stress levels and that can be simply by taking a quiet walk and reflecting in their quiet thoughts, reading a book, going out and exercising, speaking to a loved

one, and sometimes even speaking with a professional can be very helpful. We certainly want to go against stigmatizing mental health. Mental health is significantly important and it's not just in the M.S. community this is a global issue. And seeking out help when you feel that you need help to not be stigmatized it's to be recognized and we really should be overjoyed by someone who is reaching out and asking for help.

So all of these things can truly be instrumental in managing their overall health and wellness during this time. So, you know, there has been, obviously, a lot of talk about CDC. recommendations and mitigating ones with the contracting COVID-19 making sure that you are aware of potential exposure and this whole concept of social distancing. And while that, yes continues to be important we certainly shouldn't let that get in the way in doing things that give us joy as long as folks are doing this in a safe environment. So taking a walk outside can certainly be a way not only to get some good physical activity but, again can be very important for mental health, as well. It could certainly start as an important way of self-reflection and thinking about goals and what you want to do for the rest of the day, for the rest of the week and keeping your thoughts organized. I certainly find that taking a walk outside is very helpful and this is something that I have actually integrated into my routine at home.

And it's really important to understand that social distancing does not equal social disengagement. So I was - very interested to learn before the talk started that we have now celebrated our 100th day of our first reported case in the United States of COVID-19. So, you know, it's now been about three months of all of the recommendations of, you know, social distancing and, you know, walking exposures, and hearing on the news the number of cases that are popping up everywhere.

But, you know, we also need to understand that it's not really just about COVID-19 it's also about our physical health and our mental health. And we certainly don't want to advocate for people to feel



like they are isolated. There are certainly other ways that folks can keep engaged with their loved ones, with their friends, with their family, including, you know, virtual means. You know, there have been a huge influx of people who have been engaging in FaceTime and doing chats and Zoom chats and this is really a nice way to, you know, keep in touch with your loved ones because this is really important for remaining connected with their loved ones. And that certainly takes a toll when you are feeling isolated. So we need to make sure that we are maintaining that connection among our loved ones.

And as I have been alluding to this entire time mental health is extremely important. And there are certainly numerous ways that people can find relaxation and self-reflection. And some of these are offered at free application, there are certainly ways folks can remain engaged with each other through guided imagery, deep breathing, and mindfulness. Certainly seeking out counseling services when some of these opportunities are not very helpful. We would certainly encourage but, you know, please don't be shy to seek out, you know, some of these opportunities that are available if you are feeling stressed and overwhelmed during these challenging times because you are not alone. This is certainly a time of uncertainty. And, of course, all of us at the MSAA. are here to support our patients, our caregivers, and of course all of our viewers.

I was just going to say with that being said I was going to open it up for questions but, of course, Dr. (Hending).

Dr. Barry Hending: I think Peter may be asking us some questions, Dr. Hersh. But there's one that I saw on the feedback or the question and answer from people on the other side of the audio. And one of them asked the question, which is dear to my heart. That is how old is over when you speak of risks? Again, it's dear to my heart because I am chronologically one of the people at risk and that is over 65. So let me kind of address that and then, Peter, if you'll take on the other question that

you think for Dr. Hersh and for me.

We know that there is no age at which you are invulnerable, free at risk with COVID-19. So if you've been watching the T.V. and I think many of us have been watching it too much you know that there is an infant and child syndrome of COVID-19 which can also be serious and lethal. But in terms of mortality generally, mortality has increased with age and so if you look at some statistics and I want you to use these numbers as an approximate. Over age 65 the risk may be as high as 5%. Over 75 is doubled. Over 85 it's tripled. So age is in of itself a risk factor. But then much like real-life people at age 65 or 75 or beyond don't come in just one size. So the question is what about the physical condition of that individual? There may be a 75-year-old with no other comorbidities who's risk is relatively lower. In a 58-year-old with uncontrolled diabetes or hypertension or uncontrolled asthma, cardiovascular disease. I would say that age is a risk partly because increased age carries increased health risks – comorbidities.

So if I were to summarize, COVID-19 affects all ages but the older patients more so. Debilitated patients most so and that's why so many of the deaf have been in nursing homes because they combine decreased function, increase disability, and increased age. No one age is in of itself a total risk. But just another risk factor.

Peter, I think there may be other questions that you would present to Dr. Hersh or to me.

Peter Damiri: Yes, thank you so much, and thank you, Dr. Hersh, as well. Excellent presentation, great insights to those questions. And several more have come in during the presentation. There was a follow-up question on the topic of the lymphocytes. And the question was does a person need near normal levels of lymphocytes to have a good defense against COVID-19?

Dr. Barry Hendin: Dr. Hersh, do you want to lead in?

Dr. Carrie Hersh: Yeah, that's fine. Yes, I can see, you know, some questions coming in. And, you know, I certainly understand, you know, folks certainly want a more concrete answer. I would overall state, you know, we have very different of these modifying therapies with very different mechanisms of action. So sometimes it's very difficult to provide a pointed statement on the levels of lymphocytes that would be considered "safe" during a viral pandemic.

For instance, there are certain medications like fingolimod and siponimod and now we certainly have other S1P modulators that are - so fingolimod and siponimod are in this group of disease-modifying therapies and now we have a new medication of ozanimod that was just FDA approved, that by their mechanism, the way that they work is that they traffic circulating lymphocytes in the bloodstream into the secondary lymphoid organ so that way they are not available as inflammatory lymphocytes to get in the brain and spinal cord and cause increased demyelinating disease that can manifest as relapses and new MRI lesions. Now because of the way that works when someone gets a blood test the amount of circulating lymphocytes in the bloodstream are going to be low. That is how the medication works. Now we have seen historically that just because a person has a lower lymphocyte count than normal, on these particular disease-modifying therapies, it does not correlate with the linear relationship of an increased respiratory infection and urinary tract infections. So the with that being said that we do expect that those lymphocytes are going to be low in those particular individuals but that may not necessarily increase that person's risk of contracting the COVID-19 virus or having a worse off time of it. And we are starting to see that in some of the registry data that are coming through.

To answer a question because there are a lot of folks who are currently on ocrelizumab or rituximab and probably some of those patients are currently on the call and they want more information about

these particular disease-modifying therapy that have a prepotency of decreasing what we call the B-cell. So, in a normal immune system, we have our innate immune system and our adaptive immune system. The adaptive immune system is a part of the immune system that learns along the person's lifetime of when they are exposed to a current virus, which is always known as an antigen. The adaptive immune system is able to adapt or respond to that particular virus so that if the person is infected later on that person's immune system can then go ahead and create a faster immune response to that infection so they can clear a lot faster than when they were first exposed to it. The way that ocrelizumab and rituximab work, which is our B-cell depleting disease-modifying therapy, is that they deplete part of that adaptive immune system, particularly the B-cells. But what happens is that they typically leave the most immature B-cells alone, which are more of the stem cells and they tend to spare the plasma cell, which are the ones that are creating antibodies, such as IGG, IGM, and IGA. And these B-cell therapies are targeting the B-cells that are in the maturing stage but not in the most mature phase.

So with that being said, there are still circulating B-cells in one's immune system, in someone's vascular system. And by and large the other lymphocytes, such as your T-cells, specifically your cytotoxic T-cells, are spared and patients who are treated with ocrelizumab and rituximab. And we can learn by this by giving a lymphocyte panel and we can see in one's lymphocyte panel whether or not they are depleting other aspects of that adaptive immune system. And this gives us an idea of whether or not that particular individual may be at risk of developing any kind of respiratory or viral infection such as COVID-19.

So in my patients who are being treated with these B-cell-depleting agents, if I'm not seeing that there is a growth change in these other sub sets of lymphocytes, we are continuing the ocrelizumab and we are carefully monitoring their overall white cell counts and carefully monitoring them for any signs of infection. In my practice, I also recommend that around the time that they are undergoing

their infusion that they may be a little bit more careful about potential exposures. So if they aren't able to socially distance themselves from other individuals who live outside the home or other individuals who at work that this is a good time to make sure that they are wearing a mask or a facial covering and certainly engaging in frequent hand washing.

So I hope this gives a little bit more context into disease-modifying therapies and the safety during COVID-19 and that it's not a one-size-fits-all response. That it really depends on the disease-modifying therapy.

Dr. Barry Hendin:            Dr. Hersh, if you don't mind my taking me piggybacking onto what you said.

Because as usual, I agree entirely with the information you provided. But I'll elect out a couple of things you said in order to see if I can kind of contribute to understand. The first thing that people on the other side of this conversation will begin to understand is how complex the immune system is and let me begin by saying if you've got M.S. all the conversation about M.S. that you've been exposed to has been about the adaptive immune system and that is T-cells and B-cells. It's very infrequent that you'll hear that's only part of the immune protection we've got and that there is another immune protection which is the innate immune system, which is a first offense. Though if you say what's the first offense against the virus it's not the T-cells and B-cells at all it's the innate immune system. And the innate immune system is by and large not affected by the medication that we use to treat M.S. So even when we're seeing this immunosuppression, the innate immune system, the first offense remains generally fairly much unimpeded.

The second thing is, that that component of the immune system that we count on to attack viruses. For example, the cytotoxic B-cells that Dr. Hersh mentioned aren't necessarily diminished in the same proportion as other immune cells. It makes it that much more complex. So what have we tried to do? We've tried to go back to real-life experience. The very first major epidemic in Europe, the

western hemisphere was in Italy. And the Italians were the first without a lot of information with a lot of hypothetical concern said that you ought to be very careful about using the lymphocyte depleting agents. And we recognize the Italian concern in that regard.

What's happened over the past six months is that we've been able to see both the American experience, which was the COViMS that Dr. Hersh talked about. The Italians now looked at more clearly by Dr. Piersomonte (sp) with the first 250 and now about 500 patients. And that is that people on the wide ride of agents, including the ones that they were concerned about, seem to be doing as well as the general population. And their outcomes are more dependent on how old are they, what kind of general condition were they in. To add to the complexity, some of the hazards of COVID-19 is a hyper-immune response in the lungs, called a cytokine storm. And one might imagine that they have some degree of immunosuppression, immunomodulation could get hypostatically a protection against that storm.

All I need to say is there's a lot of hypotheses running around, lots of opinions running around and we're still trying to look at the general experience to understand, yes, these are the hypothetical, what's really happening? What's really happening so far is pretty reassuring. And the end of the story is not yet told. Peter, do you have other questions?

Peter Damiri: Sure, thank you so much. Can vitamin D be effective in treating the coronavirus?

Dr. Barry Hendin: Dr. Hersh, why don't you take that one.

Dr. Carrie Hersh: Yeah, no, that's a great question. And I will have to admit that, you know, as we've been doing these programs, you know, we in the MS community have also been learning very rapidly, it's been a very steep learning curve in understanding COVID-19 and what are potential

treatments. And vitamin D is actually a hot topic not only for MS but apparently for COVID-19, as well.

So, we've known for a long time that it's important to avoid vitamin D deficiency for bone health and cardiometabolic health and other purposes. But it may be even more important now than ever.

There's actually emerging growing evidence that vitamin D status may be relevant to the risk of developing COVID-19 infection and to the severity of the disease overall. We know that vitamin D has an immune-modulating effect and can lower inflammation. And this is one of the reasons why we recommend vitamin D supplementation for long-term MS health. And this also may be relevant to the respiratory response during COVID-19 and the cytokine that Dr. Hendin had just alluded to.

There have actually been a number of observational studies that have been coming out. One of them was from South Asia that looked at the prevalence of vitamin D deficiency among patients who were affected by COVID-19. And it showed that the prevalence of vitamin D deficiency was actually much higher among those with severe COVID illness compared to those with mild illness. And they actually showed that there was about an eight-fold higher risk of having a severe COVID-19 illness among those who entered with vitamin D deficiency compared with those who had sufficient vitamin D levels.

So, you know, in the MS community what we are defining of vitamin D sufficient is a level above 30 nanograms per millimeter but usually, we are actually putting the envelope forward and, you know, some folks are recommending vitamin D levels as high as 50-80. And that's really for MS health. But it certainly looks like a blood level of 25 hydroxyvitamin D less than 10 nanograms per millimeter may actually put an individual in an increased risk of having worse off time of COVID-19 compared to some who is more supplemented at a higher level.

So we're learning along the way. It does look like vitamin D has a protected role against COVID-19.

Peter Damiri: Thank you for that. I'm sorry, go ahead.

Dr. Barry Hendin: Before we go on a couple of comments. One is, we're joined on the line by one of our colleagues in the southeast, David Brandes and I think that Dr. Hersh and I would like to say hello to Dr. Brandes. Number two, a patient, a person in Arizona asked about immunoglobulin on people on Ocrevus and rituxan. The answer is that hype that low IGG low IGA have been associated with increased incidents of infections in the pre-COVID era. We're not quite sure how that will relate to the COVID-19 but we're watching.

Peter Damiri: Okay, great, thank you for that, appreciate it. And also just as a quick follow-up to the vitamin D question was asked about taking zinc, if that's recommended.

Dr. Carrie Hersh: You know that's actually been a question that has come up in my clinic more than once. You know, certainly, you know, folks like to take zinc and vitamin C in order to try to thwart respiratory viral illnesses, especially during the winter months during flu season. I have not seen any data on zinc and zinc supplementation as it pertains to COVID-19. I can certainly do my research but I have not seen anything in my lit searches thus far. I am not aware of any data. I'm not sure, Dr. Hendin, have you read up on anything on zinc and COVID-19?

Dr. Barry Hendin: No, same as you.

Peter Damiri: Okay, in the interest of time - thank you. In the interest of time I am going to pose one more question but also, respectively, would like Dr. Hendin and Dr. Hersh to respond back to any of the questions that they also saw come in or other general wrap-up questions, as well. So, the last



question that I am asking is wondering about the differences, if there's any difference in the severity of COVID-19 based on how you may be exposed to it whether someone coughs or sneezes directly in your face versus picking it up on a surface that you might have touched. And if there's any differences in how you were exposed to it to the severity that you are contracted with it.

Dr. Barry Hendin: We're happy to try to answer that one but it's going to be a common-sense answer rather than a scientific answer. To the question of do we have data that has distinguished the severity of the exposure to the severity of the disease. The answer is - that kind of information is really very limited. But common sense says with most other infectious illnesses that a lesser exposure both in terms of quantity of virus and duration of exposure to that virus has generally been associated with a lesser severity of disease. So common sense says, "I think so." There's no science yet to back up my opinion.

Peter Damiri: Okay, great, thank you. So before I read our closing comments I just wanted to ask Dr. Hendin and Dr. Hersh if they had any general follow-up statements they would like to make?

Dr. Barry Hendin: My only comment is how happy I've been, Peter, to be able to work with MSAA and what I think is the best patient platform for dealing this COVID-19 and that is where people with MS can listen to thoughts about this pandemic. I also want to express my pleasure and being able to continue to work with Dr. Hersh whose opinions I almost always share but it's a delight just to work with her in any case. Thanks.

Dr. Carrie Hersh: Yes, also my thanks to Dr. Hendin and the MSAA. It's been a pleasure working with you all. And to our viewers, I'm certainly hopeful that you have found useful information out of our webinars. I have been increasingly pleased and impressed by the questions that have come through, they are very well thought out, they are certainly highly relevant and I would certainly

encourage all of you to keep a lookout for future MSAA programs on COVID-19 and MS and we will certainly be happy to provide information as we continue to learn in this very rapidly evolving landscape. And I thank you all for your patience and your time.

Peter Damiri: Well, thank you both. I really appreciate that and all your time and expertise being with us in this series of programs to help provide information and timely updates to keep everybody safe. Well, that does conclude tonight's webinar. As mentioned, I want to thank Dr. Barry Hendin and Dr. Carrie Hersh for providing these incredibly helpful updates on this very important topic. I also want to thank our funding partners, Bristol Myers Squibb, EMD Serono, Genentech, Novartis, and Sanofi Genzyme for supporting this webinar series. As mentioned, tonight's webinar will be archived on MSAA's website very soon. And we ask you to take a very brief survey that is coming up next. So on behalf of MSAA, Dr. Hendin and Dr. Hersh, thank you again so much for watching, and please stay safe.