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Keeping Abreast of the Development of Vaccines to Prevent COVID-19: What Clinicians Need to Know

RMD Announcer:
Welcome to CME on ReachMD. This activity, entitled "*Keeping Abreast of the Development of Vaccines to Prevent COVID-19: What Clinicians Need to Know"* is Provided by Integrity Continuing Education, Inc. and is Supported by an educational grant from Janssen Therapeutics, Division of Janssen Products, LP.

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Announcer:
Thank you for tuning in. This CME program is part of a series of Twitter-based activities providing medical education on COVID-19 vaccines. If you are not already, follow us on twitter at SoMeCME. In this podcast, Dr. Carlos del Rio and Dr. Angela Rasmussen will discuss recent developments and key topics surrounding COVID-19 vaccines.

This educational initiative has been designed for infectious disease experts, immunologists, geriatricians, primary care physicians, nurse practitioners, physician assistants, nurses, and other members of the healthcare team involved in or interested in education regarding COVID-19 vaccines. This podcast is provided by Integrity Continuing Education and supported by an educational grant from Janssen Therapeutics, Division of Janssen Products, L.P. Now, let's welcome our faculty members, Dr. Carlos del Rio and Dr. Angela Rasmussen.

Dr. Rasmussen:
Thank you for joining this CME podcast activity titled "*Keeping Abreast of the Development of Vaccines to Prevent COVID-19: What Clinicians Need to Know*". I'm Dr. Angela Rasmussen. I'm a virologist and currently a research scientist at the Vaccine and Infectious Diseases Organization, International Vaccine Center, or VIDO InterVac at the University of Saskatchewan. I'm also an affiliate of the Georgetown Center for Global Health Science and Security. And I've studied a host response to infection with emerging viruses, including SARS-Coronavirus 2 and I'm joined today by Dr. Carlos del Rio.

Dr. del Rio:
Hello, I'm Dr. Carlos del Rio. I'm, um, a Professor of Medicine and Epidemiology and Global Health and I'm with the University in Atlanta Georgia.

Dr. Rasmussen:
I'm looking forward to this discussion. We've a great program planned. We'll be discussing current vaccine candidates for COVID-19 that are in late stage development and talking about safety and efficacy data and prescribing consideration. Dr. del Rio?

Dr. del Rio:
We have some data from both safety of the vaccines in pregnancy, we have data on vaccine safety and efficacy in lactating women and showing how antibodies are produced and are transferred through breast milk. And we don't know if those antibodies are protective or

not to those infants, but we know that the vaccines are safe and effective in pregnancy and lactating women.

I also think we have data showing vaccines are, are th-, you know, efficacy data has been translated also into effectiveness, right? And we're seeing effectiveness in different settings in which the vaccines are showing to be as good or better than they were shown in the clinical trials when th- applied in real life. And we're also learning about, you know, the clinical trials never talk to us about whether the vaccines could prevent infection or could prevent transmission to others. And increasingly, we're finding data showing that vaccinating individuals are less likely to get infected, themselves, and therefore less likely to transmit. So, I mean I think on a daily basis, we're almost getting a good news on these vaccines.

On the downside, I think that the bad news we've gotten is the immunosuppressed patients. I think we are seeing data from different studies looking primarily at transplant recipients in which many of them don't develop antibodies against the vaccine, as was not unexpected. But I think it just emphasizes that when you have an immunosuppressed person, a transplant recipient, for example, in your household, it's really important that everybody in your household gets immunized but it's also as important that that person continues wearing a mask and protecting themselves through other methods and don't assume that just because you've been vaccinated that you're protected.

Dr. Rasmussen:
I think that a fantastic point and I think that it really does underscore, you know, all the good news that we've seen with the vaccines, especially the protection that they confer against transmission or infection. Really, really underscores the point that as many people should get vaccinated, as possible, for those immunosuppressed people and others with conditions that haven't really been studied outside of the transplant setting where people may not be able to get a vaccine or where they may not develop protective immune responses to that vaccine. This really does argue, uh, especially given that these vaccines are likely to significantly reduce transmission in the community for healthy people who are able to get vaccines to actually get them to protect those people who are not able to get them.

Dr. del Rio:
The other thing that we're also getting data and we're seeing CDC and other organization say 'Hey, you're vaccinated, you can do this', and 'You're vaccinate, you can this'. I think we're increasingly seeing what I call peeling of the restrictions as you become vaccinated. So, I'm personally think that the data have been very positive. We are seeing also, you know, we know that adolescent trials have been completed and we expect Pfizer probably very soon getting an EUA for their vaccine down to age 12. But we're also know that for example Moderna's currently growing in the KidCOVE study is gonna be children under the age of 12 and they're expected to enroll close to 7,000 healthy kids. And I think once that completed, it may be January, February, but I'm sure this vaccine is also gonna be approved for children younger than 12.

Dr. Rasmussen:
Yeah, I completely agree with that. And maybe one point to bring up is that through the children who are over 12, the adolescent population, people will now be able to get their older kids vaccinated before the fall school year starts. And I think for many people, that's going to give them piece of mind going back into in-person schooling in the fall. Certainly, from a virology perspective, it will further increase the number of total people in the population that have been vaccinated and it will continue to reduce transmission, particularly when these are these mRNA vaccines that do appear to be so protective against infection.

Dr. del Rio:
Absolutely. And I think that, I expect that as we've started getting, you know, over 50% of the population vaccinated in some states, we're gonna start seeing some dramatic drops in the number of, of new cases and the number of transmission events. The other thing is obviously, you know, CDC through VAERS and through different other programs, V-safe is monitoring the safety of these vaccines and overall, what we've seen with both mRNA vaccines is that really strong safety profile. Yes, there are some systemic reactions, particularly with echogenicity's is stronger in people who previously had COVID, but there's been rare reports of anaphylaxis, but overall, I would say these vaccines are incredibly safe.

Dr. Rasmussen:
I completely agree with that. There hasn't been, uh, serious safety signal that's been detected for these vaccines in any of the groups that have been looked at so far. And as you pointed out at the beginning of the discussion that also applies to pregnant women, and I know that's been a, a big concern given that pregnant women are very exposed to greater risk from a COVID illness and people have been also concerned about the potential effects on pregnancy or fertility. It's really great news and reassuring news that many pregnant people at this point have been vaccinated with both Pfizer and Moderna and have had no incidences or no increased rate of miscarriage or stillbirth or fertility problems. So, it's all incredibly encouraging, and it really exceeded expectations, in my opinion.

Dr. del Rio:

Yeah, I'm glad you mentioned the fertility issue because among the many questions I get asked all the time by young people are hesitant to get vaccinated is, 'Will this impact my fertility?', and I think it's something we need to continue to remind people that's absolutely no impact in fertility. But the other question I get asked all the time, I don't know about you is, 'How long is immunity gonna last with these vaccines?'.

Dr. Rasmussen:
I do get asked that quite a bit and while my answer for many of the questions that I'm asked, including about this, is 'Officially, I don't know'. Because the only way to determine durability, unfortunately, is to wait and see how long the protection lasts. We do, at least, have some data that indicated that the protection from both of these vaccines last at least six months. And in my experience with other vaccines, and just understanding how the human immune system works, that probably will last for at least a year. That's also consistent with what we've seen in immune responses in people who have acquire immunity through natural infection. That's a lot more variable because some people don't develop extremely strong immune responses, uh, the way that they do with vaccines after being infected, but most people do develop antibodies against SARS-Coronavirus-2 and most people do have detectable antibodies after at least 8 or 9 months. So, I think we can expect these vaccines to probably provide immune protection for at least a year, and potentially l- even longer than that.

Dr. del Rio:
You know, the other you just touched about is, is durational immunity after having had the disease. And I, again, another question I get asked all the time is, 'I already have COVID, I'm immune. Why do I need to take the vaccine?'.

Dr. Rasmussen:
Yeah, there's actually a lot of great data on that. And again, we don't know about how that impacts durability, but there have been multiple studies done by independent investigators that showed that in people who have recovered from COVID, just one dose of the mRNA

vaccines induces really, really robust neutralizing antibody responses. And it's important to note that unfortunately, we don't yet have true correlative protection. That is, we don't have measurements that we can just look at in the lab, like antibody levels or neutralizing antibody levels and so forth, to determine how protective a vaccine is going to be. But high levels of neutralizing antibodies that directly, essentially render the virus non-infectious are thought to be significant drivers of protection. And in people who've had COVID before, again, just one dose really boosts those antibody levels, which really does suggest that for people with COVID vaccination, with even one dose can provide additional protection to what they already have from their natural infection. Which as I mentioned before, can be quite variable.

Dr. del Rio:
And, you know, as excellent as this vaccine is, as wonderful as these vaccines are, they're not perfect, right? So, you can still get infected even fully vaccinated. It's rare, you know, we're talking about maybe 0.008% or less so it's, it's a very rare event, but it can happen. But at least, a very encouraging thing is when we see that happening, those fully-vaccinated individuals frequently are asymptomatic or have very, very mild symptoms.

Dr. Rasmussen:
That's right. Yeah. Breakthrough infections occur with any vaccine but th- this really does underscore what the trials observed and that is that they're very protective against COVID-19 disease even though the trials weren't able to evaluate how protective they were against infection, you know, that, that wasn't tested anyway to begin with. The most important thing is will these vaccines keep you from getting sick? Will they keep you out of the hospital? Will they keep you from dying? And the answer to that is a resounding 'Yes', even when breakthrough infections do happen.

Dr. del Rio:
You know, since we're talking about that, a question that we're all getting nowadays, is about 'Will these vaccines work against variants?'. An- and overall, I tend to tell people, uh, you know, they're very effective to the variants we're seeing in circulation. They're particularly effective against the B117 variant, the so-called UK variant. But they also have some degree of efficacy of South African and the Brazilian and other of the variants out there. And I'm sure, you know, we'll, at some point in time we'll find variants that the vaccines are not as effective against, but the reality is that again, the variants that we're seeing against the commonly-circulating variants, they're very effective. So, getting vaccinated is a good way to get protected from variants. We do know, however, that both Pfizer and Moderna are working on developing booster vaccines that work against specific variants and maybe that's something we should talk about.

Dr. Rasmussen:
Yeah, so, Moderna just released results from a trial looking at boosters with original B Moderna, as well as Moderna against B.1.351, the variant first detected in South Africa. And both of these boosters were very protective against that particular variant. That's suggests that

even though some of these vaccines and this gets back to a point that you just brought up that even though some of the vaccines are slightly less effective against the B.1.351 variant from South Africa and the P1 variant from Brazil, they are still extremely effective at preventing severe disease. So, there may be a higher risk of infection, there may be a slightly higher risk of getting symptomatic COVID-19 with a variant after you've been vaccinated, but there's still excellent protection against the most severe outcomes. And it think that's what people really should keep in mind; a reduction in overall efficacy against preventing symptomatic COVID-19 disease overall doesn't mean a reduction in efficacy at preventing those really severe outcomes that we worry about the most. So, getting a vaccine now for all of the currently-known variants of concern is one of the best things you can do to protect yourself from variants, as well as to prevent new variants from emerging. Because that protection you have against those variants or any others that are circulating will prevent the virus from replicating and when the virus replicates, that's how new variants emerge. So, the moral of the story and the bottom line for me, with regard to the variants is, 'Get vaccinated with the vaccines that we have now'.

Dr. del Rio:
Well, you know, speaking of that, I think we need to move on to talk about other vaccines and, you know, I think, you know, probably the vaccine that we have gotten a lot more press lately and not necessarily the best press is the Johnson and Johnson adenovirus vector vaccine. It's a big different vaccine in the sense that this is using an adenovirus vector and an Ad26 in this case in which we're seeing the spike protein inside a non-replicating adenovirus and that is when it's injected. And, you know, it's a very good vaccine with excellent efficacy data against infection, against severe disease, against symptomatic disease. But we have seen this very rare side effects of this thrombotic thrombocytopenia syndrome, which was significant enough that actually made the FDA and the CDC put a pause on the administration of the vaccine. And now that pause has been lifted and we see that this is still a very effective vaccine. Where do you see this vaccine, going forward?

Dr. Rasmussen:
So, this topic hits really close to home for me because I got the Johnson and Johnson vaccine on April 5th, 6 days later, 7 days later, that was when the pause was issued and I woke up that morning at, at around 5:00 in the morning with my phone absolutely blowing up. I was on the west coast with people from the east coast and Europe texting me and calling me to find out if I was OK, as they knew that I had had the Johnson and Johnson vaccine and wanting to talk to me about it. So, I'll break down really quickly what we knew then, what I knew then and, sort of, the risk calculations that I went through for myself to, sort of, understand what was going on and make peace with that.

So, as I mentioned, I had the Johnson and Johnson vaccine. This appeared, initially to be six cases all in women under 48 years of age who developed this thrombotic thrombocytopenia syndrome or blood clotting with a platelet deficiency, which is somewhat unusual and rare and appears to be somewhat similar to another autoimmune condition called heparin-induced thrombocytopenia, which is another rare condition that occurs after treatment with the anti-coagulant heparin. And this resulted in these six cases having a cerebral venous sinus thrombosis, which is a very particular and unusual type of stroke. And at the time, I was thinking to myself, 'Is it wrong that I still feel good about getting the Johnson and Johnson vaccine?', because I started to think about other things that I've done in my life that also come with an increased risk of blood clotting. Now, not these particular type of blood clots associated with this platelet deficiency, not this particular type of stroke, but I took oral contraceptives starting when I was a teenager for over 20 years. I've flown a bunch of times, and I also used to be a cigarette smoker, unfortunately, well, fortunately I'm not anymore. All of those things come with a much higher risk of stroke and blood clotting disorders. In addition to that, I thought about my own risk of getting COVID-19 and for anybody who gets COVID-19, and has severe COVID-19, there's a very high risk of blood clotting associated with that and some studies it's been as much as 20% of people hospitalized with COVID-19 develop some, sort of, blood clotting disorder. So, thinking about my relative risk, 7 million shots at that time had been administered, I am a woman under the age of 50, but at the same time, there were only 6 cases of this and now more cases have been identified but it's not thousands of more cases, it's 15 total cases, I believe, have been reported in the VAERS database. So, this is something that, in terms of relative risk, is a very, very low risk.

I actually thought that the pause was a smart thing to do because it actually enabled me to understand what I should do if I did have symptoms of a stroke, at the time during that three-week period after vaccination. Two of the cases that had this that were reported to VAERS were initially given heparin when they went to the hospital for treatment and that is thought to have made their outcomes worse because of the similarity to this auto-immune condition that's caused by heparin. So, it actually empowered my clinician colleagues, and I don't know if you have any experiences to share about that, Dr. del Rio, but I talked to a couple other physicians that I know, and they said that that had actually changed the way that they were thinking about patients who have received the Johnson and Johnson vaccine and might have a severe headache or another symptom of a stroke. For me, I thought that, that it was a wise thing to do to pause it, to just make sure that this vaccine was safe.

The Advisory Committee for Immunization Practices reviewed the data about this in a very transparent manner. They were very thorough about it and that, along with the risk analysis that I just described for myself, made me feel really very confident in my decision

to have gotten the Johnson and Johnson vaccine. It really put my mind at ease, and I think restarting administration of this vaccine in the U.S. is the r- really the right thing to do. The benefits far outweigh the risks. But I do think that it's good that people who may not feel that they want to take on that risk do have a number of other great vaccines to choose from.

Dr. del Rio:
Absolutely. I, I totally agree with you, and I think the most important thing is the system worked, right? We were able to pick up this rare side effect and the system worked and, you know, now the vaccine is, has a warning and, you know, you need to discuss it with a woman under the age of 50, but overall, it works fine. I think it's time to think about what, what else is in the horizon. You know, globally the AstraZeneca vaccine, another adenovirus vector vaccine has gotten a lot of attention similar vaccine except that this is, uses a different adenovirus and in this case, it's a chimpanzee adenovirus, also non-replicating adenovirus. It's widely used. It's, it's a vaccine that is being used in many places. But it has also been associated with a similar side effect to what we see in the Johnson and Johnson vaccine. And again, the Europeans put a pause in it. This vaccine is not available in the U.S. but it's something that I'm sure at some point in time, we may see, at lease the FDA take a look at it.

Dr. Rasmussen:
Yeah, I think the FDA actually will have to take a look at it because the contracts that AstraZeneca signed as part of Operation Warp Speed do require them to submit it for evaluation by the FDA. I don't think it's going to be really needed in the U.S., but this is really an important vaccine for other parts of the world. One reason for that is that these adenovirus vector vaccines are easier to transport to places that don't necessarily have a robust cold chain, to places that don't have the infrastructure for ultra-cold storage, currently required by the mRNA vaccines and they've worked on ways to make those more thermo-stable. But right now, there are some major advantages to the adenovirus vaccines because of their ease of distribution. So, I think that, you know, both of these vaccines, there clearly needs to be more research done into what's actually causing this TTS, since it does seem to be specific to the adenovirus vectored vaccines. But again, in the AstraZeneca vaccine, this is also rare, so I think that it doesn't happen so frequently that it completely eliminates, uh, the utility of this vaccine. Many people will be safely protected f- by using this or the Johnson and Johnson vaccines.

Dr. del Rio:
(inaudible)

Dr. Rasmussen:
It's also important to note that these types of rare side effects are often not detected in clinical trials because even really well-powered clinical trials with 30- 40,000 participants, you can't detect these one-in-a-million, one-in-500,000-type events. A lot of times, these are detected once they are actually out on the full market. It doesn't mean that they're not good vaccines, though.

Dr. del Rio:
You know, since we're talking about adenovirus vector vaccines, we probably should talk also, at least briefly mention other adenovirus vector vaccine that again, we're probably not gonna see in the U.S. but we're, we're gonna see globally. And one of them is the Sputnik vaccine, you know, the one produced by Russia, which is a, sort of, prime boost strategy using an adenovirus 5, and adenovirus 26. They're also the CanSino as well as the, the Sinovac Chinese vaccines both, you know, use an adenovirus vector and they're probably gonna be used widely, globally, but we're not gonna see them in this country. But I think we just need to be aware of them because we will see people from those countries coming to the U.S. who have been vaccinated with those vaccines. And we're gonna have to learn about them.

Dr. Rasmussen:
I completely agree with that. And, you know, there was a lot of news in the past week or so about the Sputnik vaccine because it was rejected by the Brazilian regulator. And the reason why it was, was that it was actually not because of these TTS issue or anything having to do with the vaccine's efficacy, which is actually reported to be very, very good, or its safety, which at least in The Lancet paper was also reported to be very, very good in the real world. It was due to the reports from the documents that the Gamaleya Institute submitted to the Brazilian regulator and Visa that showed that there was too high of a level of replication competent adenoviruses in the second Ad5 component of that vaccine. So that's something that could actually be resolved through different quality control and manufacturing processes. What the data suggests is that the Sputnik V vaccine is quite effective over 90% efficacy in the phase 3 clinical trial and the real-world data, although it's still somewhat spare, does suggest that it is a very effective vaccine. So, we definitely need to learn more about these because people will be coming to the U.S. from other countries having gotten vaccines that are not approved in the U.S. but that doesn't mean that we should treat them as though they are un-vaccinated. If I were in a country that was giving out the Sputnik V vaccine, I would take that vaccine.

Dr. del Rio:

I would agree with you. So, let's talk about what's, what's in the horizon. And I think, you know, Novavax is one of the vaccines that we're seeing. It's completed its clinical trials. In fact, recently reported some of the data from South Africa and form the U.K. using it in, in Brazil, also. It's, it's a different vaccine, this is a protein subunit vaccine. Again, I think it's gonna be one that we see, uh, presented to the FDA and likely having an EUA.

Dr. Rasmussen:
Yeah, I, I agree with that, too. And I think this is gonna be another vaccine that's going to be very useful for globally vaccinating people because unlike the mRNA vaccines, it also is extremely temperature-stable. Protein subunit vaccines have also been used for a very long time. We are all very familiar with them. Even though mRNA vaccines and adenovirus vaccines have been studied for quite a long time, protein subunit vaccines have actually been on the market in many places for a very long time. The hepatitis B vaccine is a good example of a protein subunit vaccine. The Novavax vaccine, I think will make a huge difference on both, potentially in the U.S., but also on the global landscape. I think in the U.S. it might be a good option for people who aren't comfortable with, you know, "new technologies for vaccines". I think, though, globally, the ease of transportation and distribution of this vaccine is going to make a huge difference in terms of getting the world immunized.

Dr. del Rio:
So, since we're talking about the world being immunized, you know, I think we've all seen the good news is the U.S. immunizing a lot of people. The bad news is the rest of the world is still not there. And you just recently moved to Canada. I have family in Mexico. We're seeing a huge disparities and I think it's really important that, that we, as Americans think about immunizing the world. We cannot stop just by thinking about the U.S. alone.

Dr. Rasmussen:
I completely agree with that. You know, there's been a lot of talk about the herd immunity threshold, and I think for many people this has, kind of, become a magical number. The herd immunity threshold is more important regionally because, obviously you're going to have virus spreading within communities of people, but if we're talking about really ending the pandemic, which is by definition, 'a global event'. We need to think about getting towards global herd immunity. And that means that we can't just vaccinate people in the U.S. and hope that its neighbors catch up. As you just mentioned, you know, I just moved to Canada, you have lots of family in Mexico, there's no reasons why we should look at our families in these other countries and think that there's any kind of difference or that we would get together with them and have some of us be more at risk than others. It's really crucial that for our alliances, our trade partnerships, and just for global public health, that we begin exporting vaccines from the U.S. not only just to our allies, but to all the countries in the world, especially low and middle income countries that don't have the capacity to manufacture their own vaccines and desperately need vaccination.

Dr. del Rio:
So, questions you and I get asked all the time, 'Do you think boosters are going to be needed?'.

Dr. Rasmussen:
I do. I think that boosters may eventually be needed, but not for the reason that everybody thinks boosters are gonna be needed. I don't think we're gonna need a new booster every year for a new variant of concern. Once we get transmission down and get transmission down globally, there won't be as many new variants emerging.

And SARS-Coronavirus-2, even though there are new variants of concern and there are many variants that have emerged throughout the course of the pandemic is not like influenza, where there are many different strains of immunologically distinct viruses circulating all over the world, including in migratory bird populations that can spread them around geographically. SARS-Coronavirus-2 is, so far, just SARS-Coronavirus-2 and the vaccines will work against all the variants. So, that means that we won't probably need boosters against specific variants, at least not every year. But we may just need boosters, depending on how durable these vaccines are. If we start to see immunity waning after a couple years, that might be time to boost somebody, which is the case for many, many other vaccines that have been used successfully for decades.

Dr. del Rio:
I think you also said it very nicely when you talked about measles and travel. You may be traveling to a country where there's a certain variant or a certain epidemic and you may need a booster going to that country, but if you don't go, you may not need it.

You know, one of the things that I've seen also, is people are very concerned about challenge of non-adherence to the second dose, and I was like, 'Wait a second, 92% of people have to return for their second doses, this is actually a success, not a challenge', right?

Dr. Rasmussen:
I think so.

Dr. del Rio:
I'm not worried about that. Honestly, I'm really happy that 92% of people have come back for the second dose.

So, you know, as we think about what's next in this issue, I think we need to think about how do we vaccinate the world, how do we get people that are still hesitant to get the vaccine vaccinated, and how do we look at vaccines as the critical way to ending this pandemic?

Dr. Rasmussen:
I've been thinking a lot, lately, not just about vaccine hesitancy, because I've realized in talking to some people who are, let's just say reluctant to take the vaccines, that they don't necessarily even see themselves as hesitant. In many cases, they see themselves as having questions that haven't been satisfactorily answered. And that's a lot different than just saying, 'Oh, we need to convince people to take vaccines'. I think we do need to incentivize people to take vaccines, but I also think we need to answer their questions about vaccines. It's very reasonable, especially during an emergency and, you know, really developing vaccines in an unprecedented amount of time for people to have questions. We should definitely answer those. We also need to work on making vaccines more accessible. We need to start here in the U.S. because there are still many people who can't access vaccines for a variety of reasons and there are large pools of susceptible populations, the homeless, incarcerated people, home-bound people, for example who may not have access to vaccines, yet. We need to work on that. But we also need to increase vaccine equity and accessibility worldwide for the reasons that we discussed earlier. Going forward, this is probably the number one vaccine-related topic that I'm thinking about, these days.

Dr. del Rio:
Yeah, absolutely. I think at the end of the day, it is how do we work together to get everybody vaccinated? Frequent question I get is, 'When can I take off my mask?'. I tell people get vaccinated and you will be sooner being able to take off your mask.

Dr. Rasmussen:
That's exactly what I tell people, too. I say, you want to take off the masks? So do I. you know, I think a lot of people, I don't know if they think we're just used to wearing masks because we wear them at work, or we like wearing masks, but it's not comfortable to wear masks all day, all the time, every day, you know, in perpetuity. We'd all like to take our masks off and get back to the way we were living our lives in many ways before the pandemic. The faster we get more and more people vaccinated, the quicker we can do that. The province that I'm living in now, Saskatchewan, has just issued today a road map of reopening metrics and it's entirely based on the number of people in Saskatchewan who will get vaccinated. So, you want to take that mask off? Get vaccinated. We'll be able to do it more quickly.

Dr. del Rio:
Well, this has been a really fun conversation. I always enjoy talking to you. I always learn from you. And I encourage people to follow us on Twitter and I also want to thank everybody for listening today. We hope this podcast has been informative. Please don't forget to claim to your CME credit and please follow us on social media, you know, on Twitter and other platforms because, you know, a lot of the information nowadays is, is occurring right here on social media.

Dr. Rasmussen:
Absolutely. Thank you so much. And yet another great discussion, Dr. del Rio.

Announcer:
That concludes today's podcast, "*Keeping Abreast of the Development of Vaccines to Prevent COVID-19: What Clinicians Need to Know*". To earn your CME credit, please be sure to complete the pre-test, post-test, and evaluation. Integrity Continuing Education designates this enduring activity for a maximum of 0.75 AMA PRA Category 1 credit. Physicians should claim only the credit commensurate with the extent of their participation in the activity. For other CME programs, please go to IntegrityCE.com.

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