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COVID-19 Booster Shots: What We Know & Where We're Heading

Announcer:
Welcome to *VacciNation* on ReachMD, sponsored by Moderna. Here's your host Dr. Charles Turck.

Dr. Turck:
Welcome to *VacciNation* on ReachMD. I'm Dr. Charles Turck and joining me today to take a look at the COVID-19 vaccine booster shots is Dr. Onyema Ogbuagu, Associate Professor in the section of Infectious Diseases at Yale University School of Medicine. Dr. Ogbuagu, thanks for being here, today.

Dr. Ogbuagu:
It's my pleasure. Thanks for having me.

Dr. Turck:
Let's dive right in, Dr. Ogbuagu. In light of the CDC's updated guidelines, which patient populations are eligible for the COVID-19 vaccine booster shots and why are those shots needed?

Dr. Ogbuagu:
That's a great question and I think that we know that the vaccine boosters are needed for mainly two reasons; one is the observation of waning immunity over time and this has been shown a little more strongly in older individuals people above the age of 60 to 65, but also amongst I think cohorts like frontline workers, as well as healthcare workers followed over time. And so, based on some of these data, as well as the data that's emerged from the different groups including data from Pfizer and now Moderna and J&J showing that booster shots are able to not just improve immunogenicity outcomes, but also provide additional protection. And then the second reason is really because of delta. I mean delta, since it emerged was found to be way more infectious and I think it's led to the fourth wave of an infections here in the U.S. and has been really troublesome for other parts of the world, even those who've had high vaccination rates.

So, for now, the CDC guidance clearly states that for older individuals above the age of 65, or even those above the age of 18 who have underlying medical conditions, and these could be anything from chronic lung disease, chronic liver disease, and other immune compromising conditions, should definitely receive a booster vaccine. And then some individuals who are at risk, either through living or working in certain facilities and these are individuals above the age of 18, for example, in prison systems or other institutional facilities would, should also receive a booster. So, I think these recommendations are in line with the emerging data around again increasing vulnerability to infection for those who have been at least four to six months out from their primary vaccinations series.

Dr. Turck:
Now, based on those guidelines, patients may receive a booster shot that's different from their initial vaccine. So, are there any concerns regarding this type of mix-n-match dosing?

Dr. Ogbuagu:
I think that this is important, particularly for parts of the world that do not have access already available supply of vaccines, such that what they have at any point in time is what they can use and offer to their populations. But I think initially there was a lack of data on dose mix-n-match strategies. But I think since then, there have been important studies that have emerged. So, they have shown certainly there are advantages to certain mix-n-match combinations. We've had a lot of data emerge from the U.K. around viral vector vaccine, Astra Zeneca vaccine, in combination with messenger RNA vaccine, primarily Pfizer. And we've also had data from the NIH here in the U.S. around mix-n-match strategies. And across those studies, it appears that there, appears to be advantage to a combination of a viral vector vaccine with a messenger RNA vaccine. Granted that some of these studies have looked at immunogenicity

primarily, which is just generation of neutralizing antibodies. But also, there have been reports around safety and reactogenicity which appears to be at least comparable between the mix-n-match groups and those who stay with the same vaccine for the primary series. And so, for now, it appears that maybe there's an advantage to a viral vector messenger RNA combination which in the U.S. would translate to the Johnson and Johnson vaccine followed by a messenger RNA vaccine booster as being able to result in greater immunogenicity data. But across the board, I think that in spite of whatever series are received, the booster within the same vaccine or mix-n-match strategy that these combinations are expected to perform well in regards to preventing disease and preventing hospitalizations and death.

Dr. Turck:
Keeping those concerns in mind, what are the most common side effects of these booster shots that clinicians and patients should be aware of?

Dr. Ogbuagu:
I think that we need to think about what the known adverse events are. I think, important to mention that for all the authorized vaccines that they have been shown to be safe and some of them do have side effects, so they're relatively rare. So for example with viral vector vaccines, we know that there was an issue around clots, especially for pre-menopausal women. We know for some of the messenger RNA vaccines that for younger individuals, typically less than age 30, very rare cases of myocarditis. But in the broad sense, I think these adverse events tend to occur at very low rates such that we feel confident that anyone of the vaccines that have been authorized and/or approved should be safe. And certainly, they have to be considered some of these rare side effects, in regards to mix-n-matching. For example, I think that's an argument could be made that a combination of viral vector and messenger RNA vaccines as boosters could be a strategy that would be favored, given that some of the data that we have available. Otherwise, it appears that uniformly, across the different booster studies that the boosters tend to be as well-tolerated as the second dose of the primary series in some cases there have been maybe a little higher reports of local reactions in some cases, even lower systemic reactions. So, it seems overall that the data suggests that the booster shots are very well-tolerated across the different vaccine approaches.

Dr. Turck:
For those just tuning in, you're listening to *VacciNation* on ReachMD. I'm Dr. Charles Turck and here with me today is Dr. Onyema Ogbuagu who's sharing what we need to know about the COVID-19 vaccine booster shots.

Now that we have a better understanding of who's eligible for the booster shot, let's take a look at this in the context of other preventative measures. Dr. Ogbuagu, if a patient is planning on receiving a mammogram or flu shot, when should they receive their booster shot?

Dr. Ogbuagu:
Yeah, so, let's start with the issue of mammograms, that's a very important question because I think with both the primary vaccine series and I think with the booster shots as well, there have been reports of local reactions, particularly in the context of lymphadenopathy and there have been reports especially for women who are going in for important cancer screening modalities, like mammograms, that there could be enlarged lymph nodes that in sometimes could be a confounding diagnosis of a malignancy. So I think the guidance is best practice might be to try to refrain from a mammogram within two to four weeks following a vaccination would make some sense.

As to other vaccinations, I think some evidence suggests that we do not expect that receiving other vaccines at the time of a COVID-19 shot should impact the effectiveness of COVID-19. In the world of infectious disease in general, we're used to administering different viral antigens. For example, the measles, mumps, rubella is a composite vaccine involving three different antigens and we have other vaccine constructs that involve different antigens. So, especially because we're heading into the later part of the fall and winter, where some of these respiratory viruses are picking up, I think everyone would do well to get their influenza and a COVID-19 vaccine as soon as possible and it's OK to receive both together.

Dr. Turck:
And with that in mind, how can we address common questions and confusion points with our patients?

Dr. Ogbuagu:
With COVID-19 we've had to really educate our patients as to a lot of things around COVID-19, the pathogenous of the disease, the risk factors for progression, how to protect themselves, the role of the public health measures, including mask-wearing, physical distancing, hand washing, and now, also the critical role that the vaccines have played in the really providing robust protection against severe illness and hospitalization across the different vaccines but also to protect against infection and also a role in preventing transmission. So, I think we have to just continue to reassure the public that we continue to make recommendations based on the best evidence available and that the clinical trials that have led to the authorization and approval of treatments and vaccines in general have been very rigorous

and have gone under the scrutiny of independent regulatory agencies so that these vaccines are safe and effective and we hope that that continues to improve uptake.

Dr. Turck:
Looking to the future, Dr. Ogbuagu, how do you think the booster shots will impact our efforts to combat the COVID-19 pandemic?

Dr. Ogbuagu:
I think it's pretty clear, based on the data we have, especially with the delta variant, with its increased infectiousness that the booster shots do hold promise because we've seen some of the data, real world data and also the clinical trial data. I think Pfizer just released their data on the booster shot showing that there was about a 96% reduction in symptomatic cases between those who received the booster and who didn't, and that was a high-quality study because it was a randomized controlled trial study design. So, boosters do hold promise to restore vaccine effectiveness even in the face of a contagious variant, like delta. And I hope that as we continue to vaccinate more people I think that the greatest impact in the epidemic will actually be vaccinating the unvaccinated probably a little more than boosting the vaccinated. But I think as we get more people vaccinated, as we get less and less of the population who are vulnerable to infection hopefully we can see case numbers drop below a point where we think that the epidemic is definitely under control. But I think we've learned important lessons that this should be something that occurs not just in the United States, but globally because as the virus continues to circulate, including the emergence of what we are calling the delta-plus, as long as we've not snuffed out the virus in every part of the world, there's always concern that a new variant will emerge that can send us back to the drawing board with our vaccines, with monoclonal antibodies, and also with increasing case counts. So, I'm hopeful that as you know the vaccine roll-outs continue as people gets the boosters, and I think that we're starting to see some early dividends of that with what appears to be a waning fourth wave of infections.

Dr. Turck:
Well, with those forward-looking thoughts in mind, I wanna thank Dr. Onyema Ogbuagu for sharing his insights on COVID-19 vaccine booster shots. Dr. Ogbuagu, it was great speaking with you, today.

Dr. Ogbuagu:
It's my pleasure.

Announcer:
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