

Transcript Details

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Exploring the Various Vaccine Types: How They're Similar & Different

Announcer:

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

Dr. Turck:

The COVID-19 pandemic brought vaccinations to the forefront of medicine. and with so many different vaccine types available from mRNA to egg-based vaccines, what do we need to know about each of them?

Welcome to *VacciNation* on ReachMD. I'm Dr. Charles Turck. And joining me today to explore the various vaccine types is Dr. Jill Foster, Professor in the Department of Pediatrics, and the Director of the Division of Pediatric Infectious Diseases and Immunology at the University of Minnesota. Dr. Foster, thanks for being here today.

Dr. Foster:

Oh, glad to be here.

Dr. Turck:

Let's begin with some background information. Dr. Foster, can you give us a high-level overview of the six different types of vaccines?

Dr. Foster:

So ever since Dr. Jenner in the late 1700s, we've been trying to figure out the mixture of giving a vaccine to try to have the person make an immune response without having the illness. So we started out with just giving the illness itself. Dr. Jenner just scraped up some smallpox and gave it to someone to build immunity. Since then, we've become a lot more sophisticated. We went through stage of giving a more purified version, things like pertussis vaccine, things like that. And then we became more refined in that we were able to bioengineer and bio-produce in a mass way, things like the hepatitis B vaccine, that is a recombinant vaccine.

We also have live virus vaccines, which certainly would not want to give live virus for COVID because there would be the potential of people getting COVID from it, and we want people to be able to trust that they're not going to get the illness from it. Live virus vaccines are things like MMR, the oral polio vaccine. The vaccine is attenuated, so you're giving live organism but it's something that should not cause illness, although it's occasionally does.

Now we've become a little bit more sophisticated. We're bioengineering the antigen that we're giving, and now we have the mRNA vaccines and viral vector vaccines, which are even new technology that can give us a more precision approach to vaccination.

Dr. Turck:

Now we'll dive into mRNA vaccine specifically a little bit later. But if we look at the other types of vaccines, what are some of their biggest advantages?

Dr. Foster:

So the biggest advantages of them are that they most mimic the infection itself. So, giving that piece of the pertussis, or giving the knocked-down virus, the attenuated virus for measles, mumps, and rubella, we're giving pretty much the whole organism. We're mimicking a natural infection. And usually, natural infection is what gives you the best immunity. And so, we're trying to get the closest we can get to that natural immunity without actually having the person have to experience the illness itself.

Dr. Turck:

And on the flip side, what are some of the disadvantages or limitations we should consider for those other vaccine types?

Dr. Foster:

So the other vaccine types, especially in the ones that were the whole organism, you can get a lot of side effects just from the other parts of the organism that were kind of like the cell wall and things like that. With attenuated viruses, if somebody has an immune system that isn't fully competent, they can get the illness from it. Or you can have the wild virus revert and actually become a stronger virus that can cause illness. Those are the main side effects that are from those vaccines.

Dr. Turck:

For those just tuning in, you're listening to *VacciNation* on ReachMD. I'm Dr. Charles Turck. And today I'm speaking with Dr. Jill Foster about the advantages and disadvantages of different types of vaccines.

Now as we know, Dr. Foster, the COVID-19 pandemic has led to the development of the first mRNA vaccine. So, let's zero in on that. What are some of its advantages, and does it address the limitations of the other vaccine types at all?

Dr. Foster:

I think the biggest advantage of the mRNA vaccines that, I mean, this is just our first mRNA vaccine. It's something that can be precisely targeted to looking at exactly the part of the organism that we think is going to be. So with COVID, the spike protein is really the part that is giving us the immunity and the part that we feel that if we block that spike protein, that we can give somebody immunity and protection from illness. So, with the mRNA vaccine, we're able to create code that is injected into the person so that their ribosomes are able to produce just that spike protein, not the rest of the organism that we don't really need to make the immunogenicity, but just that spike protein. We then produce the spike protein in our own bodies so that our immune system creates antibodies and the rest of the immune system line up that we need to create that immunity. Which is something it's going to be I think revolutionary. I mean, a lot of people now are really uneasy, and not sure what to do. But this is going to be revolutionary, because we can make that mRNA for almost anything to be able to immunize as we go down the road.

Dr. Turck:

And how about the disadvantages? What do we need to keep in mind, especially since this is a recently developed type of vaccine?

Dr. Foster:

I think the biggest thing is that people don't yet trust mRNA vaccines. I think there's so much potential for the future for them, but it's an unknown, and it's making people nervous, especially in the times of COVID, everybody is so nervous anyway. Right up front, there aren't any negative aspects to it that we know of. There's myocarditis that may occur with one of the vaccines, but still occurs at a lot lower rates than it does from actually having COVID. It's going to take us a little while to fine tune it to know exactly how many doses we're going to need.

Right now, we're talking about booster doses. And a lot of people are viewing this because the vaccine failed. We know with hepatitis vaccine, we give three doses. And that's what we know works well. And I think it's going to take a little while to really fine tune exactly how much those needs to be in the vaccine and what our intervals and how many doses we need to give. And I think that's making people a little bit nervous.

Dr. Turck:

Before we close, Dr. Foster, do you have any final takeaways on any of the vaccine types we've discussed today?

Dr. Foster:

Spend a little bit of extra time educating yourselves and take the time with your patients to hear what their concerns are. And be educated yourself so that you can, address your patients concerns so that we can, you know, get that vaccine number up higher.

Dr. Turck:

Well, considering the increased attention vaccines have garnered since the onset of the COVID-19 pandemic, I want to thank my guest, Dr. Jill Foster, for joining me today to share these insights into the various vaccine types available. Dr. Foster, it was great speaking with you today.

Dr. Foster:

Great talking with you.

Announcer:

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