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A COVID-19 Update with Dr. Thaddeus Stappenbeck

September 1, 2021



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As summer winds down, cases of COVID-19 are surging in various parts of the U.S., causing concern to medical professionals. Thaddeus Stappenbeck, MD, PhD, Chairman of the Department of Inflammation and Immunity at Cleveland Clinic's Lerner Research Institute shares what you should know about the state of coronavirus vaccinations, including booster shots and FDA approvals, as well as how to best protect yourselves and loved ones as virus season approaches.

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Podcast Transcript

Intro:

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Annie Zaleski:

Hello, and thank you for joining us for this episode of The Health Essentials Podcast. I'm your host, Annie Zaleski. And today, we're talking to Dr. Thaddeus Stappenbeck, chairman of the Department of Inflammation and Immunity at Cleveland Clinic's Lerner Research Institute. As summer winds down, cases of COVID-19 are surging in various parts of the US, causing concern

to medical professionals and hospital systems. However, the coronavirus vaccines have continued to roll out across the country, with the Pfizer version recently receiving FDA approval. Dr. Stappenbeck is here to update us on the current state of vaccination in the US, including the role of vaccine booster shots, the implications of different shots receiving FDA approval, and when children might be eligible for COVID-19 vaccination. So to start off, explain a little bit about your work at The Cleveland Clinic's Lerner Research Institute.

Dr. Thaddeus Stappenbeck:

Sure. So I head a department that's very interested in trying to understand the root causes and responses to things like infections, whether they're bacterial, viral, or even autoimmune. So this thinking about COVID-19 fits quite well into the work at Lerner Research Institute.

Annie Zaleski:

So as we're speaking today, a little over 50% of all Americans are fully vaccinated against COVID-19. So what are the implications that only about half the population has this protection?

Dr. Thaddeus Stappenbeck:

Yeah. So first, it's great that we're to the 50% mark. I think this is important that we've gotten to this stage. The problem is we're going to have to go I think much higher for the vaccine to be effective. Vaccines, this really comes down to the infectivity of the virus. So the initial strains that were called the Wuhan strain, or the alpha strain, these were ... If you were infected with this, you would typically infect maybe one or two other people. And this would define what's called an R naught for the virus. If you have an infectivity of one to two people, then a 50% rate of infections actually would've worked just fine.

But as we're going to talk about with the virus evolving and mutating, it's now more infectious. And the current strain of SARS-CoV-2, which is this delta strain, is much more infectious. So if you have, if you're infected with delta strain, you're likely to infect now as many as 10 other people. So this makes that R naught now much higher, and correspondingly to achieve full immunity in the population, or herd immunity, as you probably heard, we'll probably need, the estimates are somewhere between 80% and 90% of the population vaccinated. So this is very much like a measles virus, where we have to ... Measles virus is a mandated vaccine, and the reason why is because we have to have such high percentages of people within the population vaccinated for it to be effective. If it's not a very high percentage of the population, it won't be effective.

Annie Zaleski:

So I take it that low vaccination rates in certain areas of the country are why we're seeing such a surge in cases. Are there any other reasons or factors why we are?

Dr. Thaddeus Stappenbeck:

Yeah. So certainly, you can almost go county by county, especially in the Southeast, and see where the virus is surging. It's in the counties where the vaccination growth rates are really low, in some cases, some counties as low as 30%. Again, hopefully this will be coming up quickly. That's probably not the only reason for this. Again, I think that we're still in a position where we need to maintain some vigilance because of the infectivity of the virus. We still need some degree of distancing and masking. So we're not totally out of the woods on this. The other piece of this is that there's some concern that the immunity of us who have been vaccinated with in the wintertime, this past winter, that immunity may be waning, and we may need another vaccination.

Annie Zaleski:

So what does that mean then obviously? Because cold and flu season is going to be starting to kick in soon, and viral spreads generally get worse. So what might kind of the relationship between that be?

Dr. Thaddeus Stappenbeck:

So what's very strange about ... So I think we're learning a lot about this particular virus. So usually, you think of coronavirus as cold viruses, we've known about these for decades as just common cold viruses. And so typically, we think of these as something that happens particularly in the North, where you see these really prevalent in the wintertime, when we have things like influenza that are very prevalent. But everything seems to be kind of upside down as this pandemic has gone on. And we're seeing spikes even in the summertime here with this particular virus. So I think this is something that we can't just think of this yet as a season, or a seasonal virus yet. This is something where we're still looking at waves in a pandemic, and we need to respond to them appropriately. For the flu, which is coming up, again this is going to be very important to get influenza shots when they become available this fall, and there's still the same recommendations there.

Annie Zaleski:

Wow. So viruses in general are known to mutate. And each year, as you mentioned, the flu

strain is different every year because of the previous year's strains, because it's mutated then. So why do these viruses evolve and change over time?

Dr. Thaddeus Stappenbeck:

Yeah. So it really depends on the types of viruses. So influenza has a bunch of different genes that kind of recombine with each other and form different strains. The SARS viruses are RNA viruses, and this is a little different. So these are RNA viruses, these viruses replicate when they get inside of our cells. There are certain types of viruses called DNA viruses, where they use our replication machinery that we use to have our own cells divide to make copies of themselves. And because of that, the copies don't have that many mistakes. RNA viruses use their own machinery, they encode their own machinery to make replicates of themselves. And these replication machineries are very prone to errors.

So they basically, so think of it like doing some copying, where you're trying to copy a particular words on a page. The number of mistakes that an RNA virus will make for each letter is basically a million times the rate that we would see in a DNA virus, or our own cells. So RNA viruses make a lot of mutations as they're copying themselves. And what's very interesting then is with all these mutations that emerge, some of these mutations of course aren't viable and they just disappear. But some of them actually will be selected for, because they're more fit, and they're more fit in the host. And then this is why we've seen so many strains evolve that have essentially better fitness within the host. They're more infective, that sort of thing. So this is a natural process of RNA viruses. This is what they do. And what we're seeing is really to be completely expected based on the biology.

Annie Zaleski:

Wow. That makes a lot of sense then why we're seeing, because I think with COVID-19, everyone is, the mutations are happening quicker, and I think people are concerned about it. But how you just described it, it makes perfect sense why we're seeing so many.

Dr. Thaddeus Stappenbeck:

Exactly. Yeah. This is, I think the people that study viruses carefully, this is not surprising to them.

Annie Zaleski:

So if people do happen to get infected with COVID-19, either a breakthrough case or otherwise, what sort of treatments are available to them?

Dr. Thaddeus Stappenbeck:

Yeah. So I think it's very important to know that there's a lot in the popular press about vaccines and how important they are, and talk about how important it is to get vaccinated. But if you do happen to get infected, whether or not you happen to be vaccinated, there are treatment options that are available. There are monoclonal antibodies that have now been made by several companies that are quite effective. And you can get treated with these. So the key is if you get an infection, contact your doctor. Be in contact with your doctor. And then if you have the appropriate symptoms, if you're having any trouble breathing, or you basically have symptoms that won't abate, you're eligible for this treatment, and it's very effective.

Annie Zaleski:

Excellent. So much has also been made in recent weeks about the booster shot, or the third dose of the COVID-19 vaccine as well. So how does that sort of play into the picture then?

Dr. Thaddeus Stappenbeck:

Right. It's a great question. Yeah, I wonder if this is really a booster shot, or if this is just going to be the third shot in this segment of vaccinations that we need to get. It's starting to kind of look like that. It's not uncommon when you get vaccinated for a specific virus to get multiple injections over a period of time, as much as six months. So this is, again, in vaccinology, this is not surprising. What this is based on is some data that Pfizer really obtained with the country of Israel, actually. So Israel was very interested in getting their population vaccinated very early in the pandemic. And they essentially made an agreement with Pfizer very early on that they would give them all of their data for the vaccine, so that's what they did.

And what's been great about this is we've learned a lot about the vaccine, how effective it's been in that population. But what they started to notice because again, a substantial number of people in their population were vaccinated very early in the pandemic, is they were starting to see clinically, these things called breakthrough infections, so people that were vaccinated that were getting the infection. So this wouldn't have been surprising because the vaccine, the effectiveness is 95%, so there's still going to be a certain number of people that are going to have the vaccine that were expected to get infected.

But this percentage, the percentage of people getting infected with the vaccine seemed to be much higher than 5%. And when this was studied in the Israeli population, it was recognized to be perhaps two or three times more frequent than what was expected. So then they began doing studies, immunity studies, and trying to figure out what was happening. And the

realization was is that immunity appeared to be waning over time in people that had gotten the vaccines early on. So as much as you got into the sixth, seventh month after your first two vaccines with either Moderna or Pfizer, that you would be ... Your immunity wouldn't be quite as stellar as we had hoped.

And so recognizing this, they went in and went ahead and started trying a third vaccine and studying this. So I think the data looks like it's coming along. The initial results are positive, but I think everyone's watching and waiting what's going on in Israel, with essentially this amazing human experiment.

Annie Zaleski:

Wow. I think the terms booster and third dose have been tossed around. And so can you use them interchangeably? Because I think there is a little bit of confusion about what this might mean in America, once they get some data as well.

Dr. Thaddeus Stappenbeck:

Yeah. I guess I think of a booster is something that after you've been fully vaccinated, that many years down the road, you would need again a boost for your immune system. So typically, you would think of something five or 10 years out, perhaps. This I think we're still defining the number of injections that are really going to be required to get full immunity. And again, based on what we're seeing in Israel, perhaps the number is actually going to be three. This is not surprising. This is actually not uncommon with vaccines.

Annie Zaleski:

Wow. So there are some people in America who are compromised or otherwise, who have been encouraged to get kind of a third shot already then. Who are these groups of people? And in particular, what makes them more susceptible? And why is it being recommended to get a third shot already?

Dr. Thaddeus Stappenbeck:

Right, yeah. So if your immune system isn't fully functional, you can already get this third shot, which I think is fantastic. Any type of disease you have, where your immune system either because of the process of the disease in your body, or the therapies that you're taking are making your immune system be suppressed, you can get this third shot. So there's a number of people that have autoimmune diseases, chronic inflammatory diseases that take broad spectrum drugs that suppress their immune system. They would be able to get this third dose

now. And there's a number of people that have diseases where their immune system either genetically or through other means doesn't function properly. They also can get the shot. And there's a large number of diseases that fit in that bucket.

Annie Zaleski:

Excellent. When do experts anticipate that everyone will be able to start getting these boosters, or should be starting to get these boosters?

Dr. Thaddeus Stappenbeck:

Yeah. So that's a great question, and I think especially because if immunity starts waning at six months, many people that were vaccinated in January and February are wondering. Is this going to lead to increased breakthrough infections here in the United States? And perhaps it already is. Right? So I know there's a lot of interest in this, and there's a lot of discussion on this particular topic. Pfizer has already, they published a paper last week in a Bio Archives type journal where they've shown the effectiveness, potential effectiveness of a third dose, and this is now being taken under consideration by the FDA. So I know there's a lot of interest in this, and again, maybe doing an emergency use for a third dose in the very near term. I would expect to hear something very soon, actually.

Annie Zaleski:

That's good to know. I think another big question people have are: If you are getting the third dose, do you need to get the same kind of shot you got at first? So say if you got Pfizer, do you need to make sure that you get Pfizer, not Moderna? What are the recommendations?

Dr. Thaddeus Stappenbeck:

Yeah. I think this is a great question. And there have actually been some mixes and matches done, some intentionally, some not intentionally. And there doesn't seem to be any data to suggest that there's any problems doing mixing and matching. I mean, I think the simplest thing is if you got the Moderna, get a third dose of Moderna. But if you get the Pfizer, I don't think there's really much of a problem. The basic way that the vaccines work is very similar.

Annie Zaleski:

So on August 23rd, the FDA granted full approval of the Pfizer vaccine for people ages 16 and older. So what does full approval mean?

Dr. Thaddeus Stappenbeck:

Yeah. This was very important. Usually, because of the really problematic nature of this

pandemic, obviously we needed vaccines to roll out very quickly, and we did. Still very impressed with how well this was actually done, the safety that was actually, that was ensured, and how carefully the FDA reviewed these applications, these emergency use applications last fall. What was missing, of course, was the ability to watch these vaccinated people over some period of time, and to make sure, again, are looking at efficacy, and really more safety, to make sure that these things are safe.

And now the FDA has literally hundreds of millions of people have received these doses, and there's real world data around the world that show the continued effectiveness of these vaccines and the safety as well. They've continued to really prove to be nearly completely safe. And I think that's really the most important thing. So for then the FDA to ... Again, they're in a position to carefully evaluate all these data from not only United States, but around the world. And they're in a position to make a determination I think where they can be fairly certain that this is safe, and so that's what they did.

Annie Zaleski:

Now the full approval, did that process take longer or shorter than normal? I think that's a lot of people are also curious about that.

Dr. Thaddeus Stappenbeck:

Yeah. It is shorter than normal. But you have to realize too that the number of people that are exposed to the virus is much higher too, so kind of that contraction of time for the approval I think is outweighed by the fact that there's so many people that are exposed to the virus. And so instead of having to do a study where it's a rare disease, where you have to do this over maybe a decade to actually get a vaccine approved, the data that they can acquire, the real world data that they can acquire is so overwhelming that I think the short timeframe of this is totally reasonable.

Annie Zaleski:

So if people were hesitant to get vaccinated because it was only available under the emergency use authorization, will FDA approval help change this?

Dr. Thaddeus Stappenbeck:

Yeah, again, so I think what it suggests is that, again, it's a group of really outstanding scientists and physicians that get together that very carefully weigh the data. They don't give these approvals lightly. And if this is something where you just wanted to make sure that there was

longer term safety on this, there essentially is. So I would hope that this would, if there were people still sitting on the fence, or still wondering if this is safe, I think it is. And they should really get the vaccine.

Annie Zaleski:

Yeah. I know a lot of parents are wondering too because right now, the vaccine for kids ages 12 to 16 is still only available under emergency use authorization. Why was the vaccine not given full approval yet for that age group? And is there kind of a timeline for that?

Dr. Thaddeus Stappenbeck:

Yeah, that's a great question. So because the emergency approval for the 12 to 16 year old group was delayed, they don't have as much real world data on that group yet. And they don't have this over a period of time. So that will naturally delay the full approval with this particular group to probably the end of this year, beginning of next year.

Annie Zaleski:

So are you able to speak to a timeline for FDA approval to the Moderna and Johnson and Johnson vaccines?

Dr. Thaddeus Stappenbeck:

Right. So both of them obviously are working to apply. It wouldn't surprise me if there was full approval for both of these vaccines in the near term. They were all given emergency use authorization within a month of each other late last fall and last winter. And I'm certain the regulatory processes are moving forward with those vaccines as well. They're equally as effective, or nearly equally as effective as Pfizer, and so I would expect them to be approved.

Annie Zaleski:

So I think parents are also wondering what the timeline is between kids between the ages of five and 12, when they might be eligible for COVID-19 vaccines. What's kind of the latest on that?

Dr. Thaddeus Stappenbeck:

Yeah. So here, the tricky part is to actually ... So the dose has to be adjusted for children. They're smaller. Their metabolism is different. Everything is different. As they say, they're not just little people. They're kids. So I think there's been great care in designing trials to make sure that they're safe. I think that's probably the most important aspect here is to ensure safety. And so there are trials now that are ongoing with this age group. And again, they're enrolling. They

were rolled out later. I think, again, I think the goal was to make sure that things were completely safe in adults because actually starting these trials in kids. But we should see, the trial should wrap up this fall, and we should see some emergency use authorization either late this year or early next year.

Annie Zaleski:

Are there any other reasons, or any other reasons why kids might not be eligible for the vaccine then right away then, after its emergency use authorization?

Dr. Thaddeus Stappenbeck:

No, I don't think there should be. I think once this is rolled out, it will be very much like the same type of roll out that we saw with adults, and then teenagers as well.

Annie Zaleski:

Excellent. Are there any other final thoughts, or closing thoughts, or things that you want to share with everyone today?

Dr. Thaddeus Stappenbeck:

Yeah. I realize what a challenging time this is, and that it seems like scientists and physicians are still learning about this virus as we try and move ahead, and that's the case. And I think it's important to pay attention to our governmental experts, our experts within our health systems, that are thinking about this very carefully and taking care of all of us, basically. And know that we're still in a position where we're still learning about this particular virus. But so far, I think the steps that have taken, especially toward vaccines, and some of the, I think therapies that are quite effective, like monoclonal antibodies, have been really breathtaking. And we've very fortunate to have gotten this far this quickly. And just keep paying attention to what we're learning as time moves forward. And if you're over the age of 12, please get vaccinated.

Annie Zaleski:

Excellent. Well, Dr. Stappenbeck, thank you so much. You've been so great to talk to and this has been so informative. And we appreciate you sharing your insights with us.

Outro:

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