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Expert Interviews

National HIV Curriculum Podcast

Priority Immunizations for People with HIV (Part 3)

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Dr. Shireesha Dhanireddy, an expert in HIV prevention and treatment, once again joins National HIV Curriculum Podcast Lead Editor Dr. Brian Wood to discuss vaccinations for adults with HIV. This episode focuses on mpox vaccination and administration as well as pre-travel vaccine counseling, administration for adults with HIV.

This podcast explores practice-changing issues and updates in HIV diagnosis, management, and prevention. The three podcast hosts include Lead Editor Dr. Brian Wood, Professor of Medicine at the University of Washington (UW), Editor Dr. Jehan Budak, UW Assistant Professor of Medicine, and Editor Dr. Aley Kalapila, Professor of Medicine, Emory University School of Medicine, Grady Health System. The hosts are also National HIV Curriculum Associate Editors.

Topics:

- Immunizations
- HIV
- travel
- mpox
- yellow fever
- polio

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Disclosures
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Transcript

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introduction**[00:00] Introduction**

Hello, everyone. I'm Dr. Brian Wood from the University of Washington in Seattle. Welcome to the National HIV Curriculum Podcast. This podcast is intended for health care professionals who are interested in learning more about the diagnosis, management, and prevention of HIV.

Well, I am back for another episode with Dr. Shireesha Dhanireddy. We are going to continue our discussion on immunizations for people with HIV. As a reminder to listeners, Dr. Dhanireddy is professor of medicine here at the Division of Allergy and Infectious Diseases at University of Washington. She serves as associate chief medical officer for UW Medicine and also serves as section head for the Division of Allergy and Infectious Diseases. In addition to these and many other roles and accolades, Shireesha leads the HHS [U.S. Department of Health & Human Services] Opportunistic Infection Guidelines panel and is a member of the group that specifically develops vaccine recommendations for the guidelines. I'm honored to be back with you, Shireesha. Welcome.

Dr. Dhanireddy

Thank you so much for having me again, Brian.

Dr. Wood

Of course. So, in this last installment of vaccinations for people with HIV, we're going to talk through a couple cases and focus on vaccines we haven't discussed yet. So, let me talk about case 1 and we will really focus on mpox vaccine for this specific case.

mpox-case-study**[01:25] Mpox Case Study**

What I'm presenting to you is a 25-year-old man. Comes in for routine clinical visit. He takes his ART [antiretroviral therapy] reliably. Has a robust CD4 count, let's say above 500. Viral load routinely suppressed. He has condomless sex with anonymous male partners and is open to whichever vaccines you recommend. So, in prior episodes we've talked about other vaccines, but let's specifically focus on mpox vaccine here. And let's just start with why this is still important and why clinicians should be thinking about it still.

Dr. Dhanireddy

Yeah, I know that this got a lot of press in 2022 when we saw the first cases really affecting outside of African countries that had been plagued with this before. We had a cluster of cases back in the 2010s related to

imported animals and some outbreak then, but it wasn't sexual exposure. But then in 2022, we saw a significant increase. Since that time, we've seen a dramatic decline in cases because of the introduction of vaccine. The vaccine was only available through stockpiled vaccine at that time and now is commercially available, which has made it much more accessible to folks as well and also destigmatizing because it's available in other places. So, great for this guy who is a young guy who's vaccine eager. I always appreciate that. Less resistance for getting vaccines. And there's lots of ways that we promote sexual health. And this is just another tool for promoting sexual health and decreasing STIs [sexually transmitted infections] and mpox is an STI.

So, I think it's still relevant. Even though a lot of people got the vaccine and we've seen a dramatic decline in cases, we still see cases come up, particularly clusters of cases around Pride and other events where there is a potential for increased spread. So, each summer, even after that big outbreak, we have seen clusters even here in Seattle; we've seen clusters related to larger events like Pride. So, my strong recommendation is for folks who are at risk for STIs, who have gotten STIs in the past, who are on PrEP [preexposure prophylaxis], who are on DoxyPEP [doxycycline postexposure prophylaxis] to just go ahead and get an mpox vaccine. It is a two-dose series to get really the best benefit from it, and 28 days apart, so counseling him that, yes, he should get the mpox vaccine.

Dr. Wood

Thanks, Shireesha. I'm going to dig into a couple parts of that a little bit. So, you mentioned the outbreak in 2022, which affected a lot of the world, and numbers of cases have really decreased, but—I don't know about you—in the last couple of years I've at least seen a couple and am aware of a couple, and it can still be pretty severe, right?

Dr. Dhanireddy

Yeah. And the data that's been published about this, particularly in HIV, the cases that we're seeing that are more severe are generally people with very advanced HIV, so CD4 counts less than 100. And that's definitely the case when we saw those cases in 2022. Although, you know, we saw patients that were immunocompetent as well and people without HIV that had a significant number of lesions. And even though they didn't have visceral involvement, some of these individuals had lots of lesions, which can be scarring and cause a lot of distress. And so, it is beneficial to get the vaccine. We do know that the vaccine can decrease the severity of presentation. So even if you do get exposed to mpox, you may just have a lesion or two, versus having a lot of lesions and having more risk for visceral involvement.

This gentleman with a higher CD4 count, likely to have less severe disease, but this could decrease that even further to have maybe just one or two lesions. And we've definitely seen that where the vaccine isn't 100% at preventing all disease, but people have very limited disease if they do get it after being vaccinated.

Dr. Wood

I think that's a really great lesson, and this is just an important message that clinicians should still be thinking about mpox vaccine. I think it's easy to forget about it when there aren't many cases. So that point about CD4 count, so the illness severity can be much greater with low CD4 count. Is there any CD4 count at which mpox vaccine is contraindicated? How does CD4 count affect your counseling and offering of the vaccine?

Dr. Dhanireddy

There isn't a CD4 count where it's contraindicated. It's not a live vaccine. And so that's really important to know. And actually, we really want to make sure that people with very low CD4 counts are getting the vaccine. In terms of vaccine responsiveness, they may not have the most robust immune reaction, but still, just like how we approach other vaccines, we want to get the most vulnerable people immunized as much as possible to prevent severe disease.

mpox-vaccines**[06:41] Mpox Vaccines**

Dr. Wood

Yeah, that's such a good point. And then, Shireesha, we're saying “it” as though there's only one mpox vaccine. And I think realistically there's only one that most clinics carry and clinicians are using, but just for the sake of talking through all the details and helping learners, can you just mention the two different vaccines and why we favor one?

Dr. Dhanireddy

So, JYNNEOS, which is the brand name for the vaccine that we are commonly using is one. They're both actually smallpox vaccines. That's how they were introduced, so there's not an mpox-specific vaccine. Because they're similar viruses, this has been shown to be effective at reducing clinical manifestations of mpox as well. The other vaccine, ACAM2000, is a live vaccine and it is, again, a smallpox vaccine. We do not use it because it requires a variolation, which is essentially injecting the vaccine in little needles into the space, and it causes a mild form of the disease. And so, it is effective, but it is essentially you're inducing the disease. And in patients with abnormal immune systems, this is not something that we would be doing. So, it is generally not used in the United States anymore. And I can say that ACAM2000, it's a stockpiled vaccine really for biodefense, but now that we have the JYNNEOS vaccine, it's really taken over the ACAM2000 as a safer, more accessible vaccine.

Dr. Wood

And so just to emphasize that point, have you ever offered, ever recommended ACAM2000?

Dr. Dhanireddy

I have never offered or recommended ACAM2000.

Dr. Wood

I haven't either, and I would imagine most clinicians have not either. So just to hit that home for clinicians who haven't offered vaccine before, for clinics who aren't stocking vaccine yet, it's the trade name JYNNEOS vaccine. You mentioned, Shireesha, it's two doses. And then a question that has come up in recent years, would you ever give a booster? And as a corollary question, do you think that individuals who have had mpox infection in the past and recovered, do you think they should be offered vaccine?

Dr. Dhanireddy

It's such a good question. And people often question why do some vaccines need repeat doses and others don't? And how can we trust vaccine durability, response durability? It's a really good question because things like hepatitis A, we say you're good for life, hepatitis B, you're good for life, with some caveats, but then like flu we have to give repeatedly. And so, there's some things on the pathogen side and things on the host side that affect that. But in this situation, it's felt that when you have an infection to mpox or you get the vaccine, that it's a lifelong immunity, that there is a durable immune response. And so, for people that had mpox in the 2022 outbreak, and then we see more clusters, they're like, "Should I be worried? Should I get another one?" Our response currently is, "No, you don't need another one." That you've had mpox, you've got a good immune response. Does it mean that they won't get any lesions, that they're 100% effective? I will say that no vaccinologist would ever say you're 100% from a vaccine ever, and that's true. We have seen cases of people who had previous infection or previous vaccination who have had very mild forms of disease upon re-exposure to mpox. So, again, no current recommendations for a third dose or any doses after infection.

mpox-vaccination-site**[10:42] Mpox Vaccination Site**

Dr. Wood

And then clinicians might not be 100% familiar with why the site of administration for the JYNNEOS vaccine changed for a while in 2022. Could you talk a little bit about that and which site you are now recommending?

Dr. Dhanireddy

So, in 2022, when the vaccine was repurposed for this, the JYNNEOS vaccine, we had a lot of demand and not enough vaccine. It is recommended to give as a subcutaneous dose, but that dose is a higher amount than an intradermal dose. Previously, there had been studies around using intradermal, saying that it was effective as well, and that's a 10th of that dose. And so, we could stretch out the doses essentially more by giving an intradermal. There were some caveats to that. For people who have severe skin reactions, there was a relative contraindication around giving intradermal at that time. There is no longer a shortage of vaccine because it's now being manufactured by a commercial pharma, so there is no need to do intradermal. And pretty much the standard has been switched to giving subcutaneous, which ends up having less scarring of the skin in those sites.

And so, one of the concerns at that time is when they were giving intradermal, it was on the forearm and people were wary of having that scar as a stigmatizing thing as someone, oh, I got the mpox vaccine and it's obvious that I have this scar. And so, there was some sensitivity around intradermal, and some people really didn't want the intradermal vaccine.

Dr. Wood

Thanks for clarifying that. So currently subcutaneous is what is recommended, there is plenty of supply, and then just coming back to the message, clinicians should still be talking to individuals about this if they may be at risk for mpox.

Dr. Dhanireddy

Yeah. So, I say anybody with an STI, anybody who's on DoxyPEP, anybody who's on HIV PrEP, those are indications that this person is having condomless sex and may be at risk, and so, at a minimum, all of those groups should just get the mpox.

Dr. Wood

Anything else you'd like to emphasize about mpox vaccine as a takeaway for clinicians?

Dr. Dhanireddy

Don't forget about it and think about it as part of the toolkit for sexual health in our patients. HPV [human papillomavirus] vaccine is one of those also that we think about for our sexual health toolkit, DoxyPEP, HIV PrEP, STI testing, postexposure treatment, partner notification, all of those things are part of that, but I think just don't forget about it in your toolkit.

Dr. Wood

Don't forget about it. And that's a great framework. It is part of everything we can offer to promote sexual health and empower people. That's so great.

pre-travel-counseling-vaccines**[13:50] Pre-Travel Counseling and Vaccines**

Now we are going to switch topics, and we are going to talk about travel vaccines for a few minutes. So let me just pose another scenario to you for the sake of discussion. So, this scenario, this clinical case is a

60-year-old gentleman who has long-standing HIV, takes ART, but CD4 count has never rebounded to much higher than 200. CD4 counts in recent years have all been, you know, bouncing around, right around 200, let's say 190 to 220, 230 or something like that. Viral load is undetectable. He's taken a new job. This new job is going to require regular trips to West Africa. So, let's just start with how you think about travel vaccines. And specifically let's start with yellow fever vaccine, because I know there's been question and controversy about that over the years. When do you recommend yellow fever vaccine and how do you counsel patients about it?

Dr. Dhanireddy

Yellow fever is a good one to talk about because there are some risks with yellow fever vaccine. It is a live vaccine. There's only one available in the U.S. and it is a live vaccine. A couple of things when we think about live vaccine in patients with HIV or immunocompromised conditions. We think about safety and efficacy. Safety: does it actually do more harm than the benefit? Meaning can you have illness related to the vaccine? Yellow fever, there are well-known documented risks with yellow fever, and you can actually have yellow fever vaccine-induced disease where you can actually amplify the virus type that's vaccine-related in patients who have disease. And there's two types of disease, visceral or neuro. And so, this is where it can go into the CSF [cerebrospinal fluid] or where it can infect organs, and patients can become really sick. And so, it's not a trivial thing, and so there is a lot of counseling to do around that.

In patients with higher CD4 counts that have well-controlled HIV, the risk is a lot less. But in patients who have uncontrolled HIV, less than 200 CD4 count, it's really an opportunity to talk about the potential risk. And if it's an active outbreak area of yellow fever, which you can find out using CDC or WHO resources to see, then have a conversation like, "Do you really need to go? Because this is a potential risk for you." And then if the vaccine, if there's not an active outbreak, they want to go, but they've got a CD4 count less than 200, I'll talk about risk and I will write a letter saying they have a condition that makes it contraindicated to give the live vaccine. They can present that upon entry because some countries require documentation of yellow fever vaccine status to be able to enter. And so, you want to make sure that they have some form of letter or proof of vaccination to be able to enter the country.

It is more complicated if they're doing travel within Africa, for instance, where they're going from a yellow fever endemic country to another country, that may make it more challenging for entry, and they really probably want to find that information out prior to going all the way there and being turned away. And so, this is why I end up having more of a conversation around yellow fever and risk and really what is that risk. There have been huge outbreaks in certain areas, and that's when I say, "let's think about the risk of travel and whether this is the right time to go versus waiting for that outbreak situation to die down," for instance.

Dr. Wood

So, it sounds like you're really weighing the safety and risks of vaccine versus the risks based on pre-planning and knowing a specific destination, a specific travel itinerary, outbreak situations.

Dr. Dhanireddy

Yeah. So, then the other thing is efficacy. When we think about people with abnormal immune systems, we don't know, right? Previous recommendations were you can look at neutralizing antibodies, but that's not a test that's commercially available. And most of the time, I don't know about you, Brian, but they don't come in with a lot of lead time before travel.

Dr. Wood

Nope.

Dr. Dhanireddy

And so, there's not really a way to really test this. And so, patients with lower CD4 counts, their immune response to these vaccines is going to be less for a lot of these vaccines. And so even if we give it, are they really protected? And that the context with which I have that conversation, like, "Sure, we can give you this vaccine, there are risks, but I also don't know if it's going to be protective for where you're going if there's an active outbreak."

Dr. Wood

And then coming back to something you said before, Shireesha, to make sure it's clear, I think what I understood you say is if someone's CD4 count is below 200, in general, you would weigh the risk of the vaccine to outweigh risk of infection and illness from yellow fever. So, if a person decides they want to go, they need to go, in that situation, you write a letter stating that the vaccine is contraindicated if they need to show proof as opposed to giving the vaccine. Did I understand that correctly?

Dr. Dhanireddy

That's correct. But there is a little bit of wiggle room. I mean, if their CD4 count is 10, that is a situation where I think the risk is there, and there are reports of people doing very poorly with yellow fever vaccine-related disease. And then, again, we don't know the benefit of the vaccine and prevention, and we're giving them potential harm. And so that's how I try to frame that conversation. In all of the time that I've been at Madison, I think I've recommended someone not to go somewhere once, and so, and they delayed their trip.

Dr. Wood

And I specifically made this clinical scenario CD4 count right around 200, and so I would imagine there, it's a lot of counseling, shared decision-making, there's a lot of factors that would go into it.

Dr. Dhanireddy

Yeah. And if they're suppressed and they're 200, I think it's a little bit different than if they're lower and unsuppressed and have more advanced disease, yeah.

Dr. Wood

And obviously there's a lot of counseling about protection from mosquitoes that goes into this. There's a lot of more general counseling, which we're not getting into, but when you have a pre-travel visit, there's a lot of counseling that goes into it.

Dr. Dhanireddy

So personal protective equipment to prevent mosquito netting, avoiding areas of dawn and dusk for malaria and other things. But in general, there's ways to mitigate some of that risk. But in an active outbreak, I think that's a little bit harder when there are a lot of cases.

Dr. Wood

Yeah, absolutely. And we'll keep focusing on the vaccines. Just don't want listeners to think we're ignoring that part. It's important as well.

typhoid-vaccine**[20:51] Typhoid Vaccine**

Let's switch gears to typhoid. What are your considerations and recommendations around typhoid vaccine for travel?

Dr. Dhanireddy

There's a lot of typhoid. And so, a lot of travel, Africa, Asia, South America, there's typhoid, and so it is one of our most frequently used vaccines for travel. And also, because it doesn't have lifelong immunity, and so you do have to repeat the vaccination. Fortunately, there are two forms of the vaccine. One is a not a live vaccine that's given by injection, and the other is an oral live vaccine. Because the two are available, and even in patients who have relatively preserved CD4 counts, we do recommend getting the injection inactivated vaccine, because they're both available, they have similar efficacy. The main difference is that the injectable inactivated one needs to be given every two years, whereas the live one is every five years. That being said, we actually don't know how durable and how effective is it in people with HIV. And so, my practice has been to give the inactivated one, mainly because they're in clinic, you can just give it, be done, and then they have that protection prior to travel.

For patients who don't want that, I think you can go outside the preferred recommendation, and if their CD4 counts are relatively normal, go ahead and offer the live vaccine. Again, not knowing, is it really going to last the five years in terms of that durability? And a couple of things, it is an every-other-day medication for four doses, and it can't be taken with any antibiotics. That could inactivate the live vaccine. And it has to be taken with sort of lukewarm, not hot beverage that can also inactivate the live vaccine. So, a couple of things rather than just a one and done, you're done and you can be on your way. So, those are the main differences.

Dr. Wood

And I think the live oral pill requires refrigeration and has some other caveats around it too.

Dr. Dhanireddy

Yes.

Dr. Wood

So, if I'm hearing you right, preference in your practice for the injectable inactivated vaccine, with the main downside being it only… protection, as far as we know, as far as is best estimated is two years, so the vaccine per recommendation should be repeated every two years. And then if in more atypical, rare circumstances a person really wants the live virus oral pill version that lasts five years, it could be considered, especially if the CD4 count is relatively high. Did I understand that right?

Dr. Dhanireddy

Yes.

Dr. Wood

Every two years comes up pretty frequently. I have patients in my clinic who travel a lot, and repeating that typhoid vaccine every two years, it comes up quick, but that has generally been my practice as well.

Dr. Dhanireddy

Yeah. One other important thing to note, because it's not uncommon for people to come in very late before their trip. There's a lot of last-minute planning for travel. The injection ideally is given two weeks before, whereas the pill can be completed one week before, which is still essentially the same, but there is some partial protection probably. So, I do like to let people know that these don't work right away, and food and water safety is still really important for the people that get these vaccines late.

other-travel-vaccines--resources**[24:33] Other Travel Vaccines & Resources**

Dr. Wood

Let's move to other vaccines for travel. When one looks at the possibilities, there are a lot listed, malaria, cholera, rabies, polio, meningococcus, Japanese encephalitis, there's a lot we could talk about there, but could you, just in general, Shireesha, when are you thinking about those? What's your general counseling?

Dr. Dhanireddy

Let's tackle malaria first. I think some people will come in, and they just want to get protected for everything. There is a vaccine for malaria, but it is actually not for travelers. It's for children in endemic areas to malaria because they have the highest morbidity mortality from malaria, and it's to prevent that. And so, it's not approved for giving for travelers. And there's a way to prevent it, but that's chemoprophylaxis by taking medication to prevent malaria. So, I just want to put that out there. For other vaccines, I do like to check the CDC and WHO, and I recommend that people do that too, just to look for areas where there is Japanese encephalitis outbreak, because it's hard to remember everything off the top of your head.

And people go to all sorts of places, and so places that, you know, you may never go to or have never even heard of and so looking that up is really important to get a sense of what are diseases that are endemic to that area where there have been outbreaks, where there's a possibility of transmission. So, mosquito-borne diseases, for instance, where are those mosquitoes live that are the vectors for these viruses like Zika, like Japanese encephalitis, and then being able to counsel patients on prevention for those things. And so, there is a vaccine for Japanese encephalitis. I'll say for most people, they don't need that vaccine. If you're planning prolonged travel to an area where there's an active outbreak, then that's something where I'd consider. But for most of the casual travelers that are going for a week or two somewhere, that is not something that we typically give. Similarly, cholera vaccine, it's relatively new in the last 10 years, but really its benefit is for relief aid workers going to areas where there's poor sanitation and outbreak or for potential for outbreak. So, the casual traveler on vacation or business is not going to be really at risk for cholera if you just practice routine food and water safety. It's really for those densely populated encampments and relief areas, war-torn areas that may be at risk due to poor sanitation.

Dr. Wood

Thanks, Shireesha. And then anything you would want to add about polio or meningococcus? Those are two others we consider.

Dr. Dhanireddy

Yeah, so I'll talk about meningococcus. So just to remind folks, meningococcal vaccine is recommended for all folks with HIV. As an adult—you get your pediatric series—but then it's recommended to get two doses in an adult and then a booster every five years of the quadrivalent vaccine. That's the ACW and Y-135 serotypes of the meningococcal disease. And so, they should already be protected, but I know that some people don't prioritize this vaccine over some other vaccines that we may want to, given that the prevalence of invasive meningococcal disease is pretty low, even though it's much higher in people with HIV, the overall incidence is relatively low. But for travel to certain areas, strongly recommend that patients get this. The meningitis belt, which is a band across the continent of Africa, high risk for particularly in the dry seasons for meningococcal disease. So, again, looking at the CDC, WHO maps and looking to see is that where my patient is going, is it in that belt, and then giving the vaccine.

The other place, there is a requirement for vaccine to Saudi Arabia if people are traveling for Hajj or Umrah, and they will check for vaccination status of a conjugate vaccine within the last nine years to be eligible for entry. And so, if they've been up-to-date on their routine HIV vaccinations, that won't be an issue, but if they're not, making sure that they do have that vaccine. Again, this is quadrivalent vaccine. For travel, you do not need the meningitis B vaccine. And I know that there's that separate B vaccine, but now there's also a pentavalent vaccine. That's not really for travel. It's really for more routine vaccination in the pediatric

population.

Dr. Wood

And what points to consider would you give listeners about polio vaccine?

Dr. Dhanireddy

Most people have been vaccinated for polio. The most important thing is we never should give live polio vaccine in this country. We have inactivated polio vaccine (IPV), and that is the preferred vaccine. There have been documented transmission of vaccine-type polio in the U.S., but also what is circulating in most countries with polio is actually vaccine-derived polio. And that's an important thing to note, and so we should only be using IPV. On any given year, there's only about two to four countries that actually have still wild-type polio left, but most of the outbreaks are going to be vaccine-derived. So, if you're going to an area and you haven't had a polio vaccine for a while and you're going to an area that does have ongoing polio transmission, then I do recommend getting an IPV.

Dr. Wood

So, a lot of this centers on knowing an individual's travel itinerary, knowing where they're going, what they're at risk for. So, let's conclude here, Shireesha, with just talking about resources. Where do you turn to get up-to-date info on outbreaks and risk, and what is recommended for a specific country or region?

Dr. Dhanireddy

There are a couple of resources. So, CDC has really good maps for malaria and yellow fever that they link to, and it has a general idea of what you can give. If you want more detailed information about outbreaks, it's helpful to go to the WHO website. They often have a lot of detailed information around that. Both of those are free resources. There's another resource, Travax, *Shoreland Travax,* that I use that compiles all that information and also has the added layer of potential security threats that are present in those areas. And so, if there's an area of conflict or other hazards that may not be in the infectious disease realm, then you can give a more comprehensive view of travel safety that's not just vaccine-preventable disease.

Dr. Wood

Oh, that's great. So, CDC, WHO, Travax, really the three go-to resources. This is so helpful, so educational, as always. Shireesha, I appreciate your time very much. Thanks for being with us today.

Dr. Dhanireddy

Thank you so much.

credits**[31:41] Credits**

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