

Scott Redding: Welcome to the 3Ps of Cancer Podcast, where we'll discuss prevention, preparedness, and progress in cancer treatments and research, brought to you by the University of Michigan Rogel Cancer Center. I'm Scott Redding.

We're here with Michigan Medicine doctor Diane Harper to talk about Human Papilloma Virus or HPV. Dr. Harper is the physician director of the Rogel Cancer Center's community outreach program and a family medicine OB-GYN scientist that has worked with the World Health Organization to prevent cervical cancer, the fourth most common cause of cancer deaths in women.

She's internationally-recognized as a clinical research expert in HPV-associated diseases, the prevention, early detection, and treatment for the prevention of cancer. Welcome, Diane.

Diane Harper: Thank you.

Scott Redding: Can you tell us what HPV is and what was your whole interest in it?

Diane Harper: HPV is a virus that spreads skin-to-skin, which is different than most viruses. It's not spread through the air, it's not spread through bodily fluids or blood or any of the other kinds, but it's a sexually transmitted disease that's spread by human contact. We have to touch each other to get it.

My interest in it happened way back early in my career when I saw a young 17 year old girl come to me in what we call colposcopy clinic, a place where women with abnormal pap smears come to make sure they don't have cancer. At 17 years of age she'd already had five surgical procedures to cut off the end of her cervix.

She hadn't even started to have her children yet. All of these changes were just really early, early changes. They weren't even close to being a cancer change. That really sparked my interest in making sure that we were appropriately treating the appropriate women who really had disease that was going to become a cancer and not treat people who didn't have cancer or precursors to cancer and understand what that difference is.

That difference is the virus HPV. If HPV is in a low-risk category or if it's sitting in the outside of your cell it will cause an abnormal pap smear but that won't ever become cancer. If HPV is a high-risk type or it gets inside the nucleus of your cell then that is something that we detect as a pre-cancer, something we call high grade disease or CIN23 disease, and that's easily detectable and 100% treatable so that you don't have to progress into cancer.

Scott Redding: You talked about some of the detection avenues with the pap test. Are only women at risk for HPV? Should other people be concerned?

Diane Harper: Well, remember that I said that this is a skin-to-skin contact. Gender doesn't really matter in skin-to-skin contact. As human beings, we hug and touch and love each other regardless of which gender we are. Therefore, HPV is gender blind too.

HPV affects men and women. It affects transgendered men and transgendered women and it affects any kind of human being that there is. It happens from skin-to-skin contact and the different areas that are considered moist. The moist skin, things like inside your mouth, inside the vagina, the cervix is moist, the anus is moist, so rectal cancers, those are the kinds of areas that get infected with HPV.

Because it's skin-to-skin contact, the only non-moist area that causes HPV-associated cancers is penile cancer. That's certainly a male-oriented cancer. We have penile cancer on the men's side. On the women's side we have cervix, vagina, and vulva. For both of them we have head and neck cancer and we have anal cancer. Those are the majority of HPV-associated cancers that are skin-to-skin transmitted to each other.

Scott Redding: Are there screening options for those other cancers that can pinpoint that it was from HPV that those cancers originated from?

Diane Harper: Really good question. The only thing we have screening for is cervical cancer. The United States Preventative Services Task Force just a couple of months ago finally approved primary HPV screening for cervical cancer. We can now screen for actually the virus that causes this and have that be our primary screen rather than the other pap smear, which is kind of in the past now.

For the other types we have never developed an appropriate general population, who have no symptoms, who have nothing else going on, we've never developed any kind of screening. At this point we say, crudely, if your butt itches go have your doctor look at it. Make sure you're getting okay ... If your voice is getting hoarse and your hoarseness isn't going away, go have somebody look at it. If you feel lumps and bumps somewhere, if anything starts to bleed in times when it shouldn't be bleeding, go see your doctor. Those are things to look for.

Scott Redding: If there's no screening for the other cancers from HPV how can Michael Douglas say that his head and neck cancers were related to HPV?

Diane Harper: What happened with Michael Douglas is that they went in and did the surgery and they got the tissue and now head and neck surgeons are sending that tissue to pathology for HPV testing.

The reason they're doing that is because there is a difference in the head and neck cancers that are caused by HPV and the head and neck cancers that are caused by alcohol and smoking. The HPV-associated head and neck cancers, the

bad news is you have head and neck cancer. The good news is you have HPV-associated, which means that you have the opportunity to live longer than if your head and neck cancer was just associated with smoking and alcohol use.

It's become a routine part of head and neck cancer surgeries now to determine whether or not this is HPV-associated.

Scott Redding: Are there ways to prevent HPV? I mean, it's skin-to-skin so what would be an appropriate way to prevent that? Again, you come into contact with skin all the time and with other people, various different activities.

Diane Harper: Good question. It's important to note that there are over 100 different types of HPV. 100 different cousins, say, that can infect us. There are only 40 types that can infect those areas that are moist. More of the sexually-related areas.

Of those types you can only spread them in those regions. You can only spread mouth HPV to other moist areas. You can't spread it to your elbow or your fingers or your toes or your heels or something like that. It's very region-specific as to where those are.

Because of that we recommend condoms. We think condoms help. They help reduce transmission by about 60%, which isn't 100% but it's helpful for reducing that. That includes both a male condom and a female condom as well as a dental dam for those who are having oral sex. Those are ways of still being able to have intimate contact with another partner but without exposing actual skin-to-skin contact.

Now beyond that we have the HPV vaccines and the HPV vaccines will prevent you from being infected with very specific HPV types. They never treat it ... If you have that infection it will not make that infection go away. If you don't have that infection it will protect you from getting that infection in the future.

I think it's also important to know that if you had the infection in the past, so say you had an HPV 16 infection in the past and it cleared and you got the vaccine, it would protect you against future HPV 16 infections. That is something where we see that there is positive benefit even if you've had an infection in the past.

Scott Redding: If I'm a carrier for HPV but I don't end up with cancer can I still spread that to someone and they get cancer?

Diane Harper: Yes. That is the idea. That's what happens is if you would have an HPV 16 infection and you spread it to your partner and your partner is now positive for HPV 16, one of two things can happen. 95% of the time that virus will go away all by itself and never cause her any harm. She may be detected for it but it won't cause harm. 5% of the time it can move on into her body and cause a cancer.

Likewise, if she has infection she can spread it to a new partner. It's something that while 95% of the time it doesn't cause disease in yourself you can still be transmitting it to other people. Because of that possible vector, that possible transmission to other people, it's something that you want to be aware of and something that you want to know about yourself and know about disclosing to a future partner.

Scott Redding: With vaccine being one of the preventative measures when is probably appropriate timing to start thinking about getting an HPV vaccine?

Diane Harper: The HPV vaccine has been approved now by the FDA to start as early as the age of nine. It has recently been approved up to the age of 45 for both girls and boys, men and women. In part, that has been done because we know that the vaccine works before you're infected. We also know that it works after you're infected if you don't currently have that infection or against new types of infection that come forward.

When you're talking about the young child you talk about, "I want to get them protected so that that vaccine lasts long enough to get them through when they could possibly have a cancer." The first wave of cancers for cervical cancer is in that 35 to 45 age range. If you give them a vaccine and the CDC is recommending 11 to 13 years of age, somewhere between there, up to 15, you know you've got about 10 or 15 years of vaccine protection so you're going to protect yourself from that first bump in cervical cancers.

What the FDA has done by allowing us to give vaccines to men and women in an older age range is that we can now potentially vaccinate women in their forties, their 40/45 years of age, and that's going to protect them against the second bump in cervical cancers, which happens in the about 50 to 65 years of age range.

You have different age bumps for when cancer happens in cervical cancer. It's all related to when they get the HPV infection. It takes about 15 years for that HPV infection to become a full-blown cancer, which is why we don't really know for sure that the vaccines prevent all cancers forever in the future. We know if they can protect for a certain period of time we're protected from that first hump.

Maybe we'll need boosters when this young cohort of people are vaccinated. Maybe when they're 40 or 45 they'll need a second set of boosters to get them through that second hump. That's what we're looking at now. We're looking at vaccinate our younger teens ... Again, if 11 is too young for you, if nine is too young for you, 15 is fine. 18 is fine. There isn't a magic age in that age range. It's the fact that you're protected against the infections.

The other thing to realize about the vaccines is Gardasil 9 is the vaccine that we have in the United States that protects you against seven cancer-causing types.

There are 14 cancer-causing types. It only protects you against half of the number of types that can cause cancers. While vaccination is really good at prevention you have to pair that with screening, especially for cervical cancer.

Scott Redding: What are the exact types of HPV that are prevented by Gardasil 9?

Diane Harper: Gardasil 9 covers two genital wart types, 6 and 11, and then the other seven types are cancer-causing types. Those are HPV 16, 18, 31, 33, 45, 52, and 58. 16, which is by far the biggest player ... It's the biggest player in head and neck cancer. It's the biggest player in all of the other cancers. It causes well over 50%, sometimes up to 70%, of the cancers.

Scott Redding: Are those ... You said 16 covers most of the cancers. What are the other ones go towards any other specific cancer or not? Or is it just ... What's that ... I guess in other times we talk about tumor makeups. What does that makeup look like based off of these numbers?

Diane Harper: What it means is that if you've got protection against HPV 16 you've got the biggest amount of coverage possible. If you get protection against 18 that adds another segment more. That adds about 10% more of the cancers. As you add the other five types that Gardasil 9 has in it, you get maybe another 10% more coverage in types that allow you protection against cervical cancer.

Somewhere between the high 80s, maybe 90%, is possible potentially with Gardasil 9. The big piece of information is that it's good. We need to give it. We need to give it in three doses. We need to make sure we're screening because it's not 100%. It doesn't cover all types.

Scott Redding: We talked about vaccine as a preventive measure. I know with many cancers there's lifestyle and environmental aspects that can also cause cancers. Is there anything along those lines that would be good from a prevention standpoint as it relates to HPV or any of the cancers that are associated with HPV?

Diane Harper: I think for both men and women they should know that smoking makes you more likely to keep the infection if you get infected with it. The best thing you can do if you have an HPV infection, or even if you have an HPV cancer, is stop smoking.

It's much more likely to interfere with your body's ability to clear the HPV so just stop smoking. That takes a lot of time and it takes a lot of willpower. A lot of very good smoking cessation programs are available. Most physicians will ask you, "Are you interested? Would you be interested in stopping smoking?" That is one of the best things that can help a woman who has a positive HPV test, develop a negative HPV test. Those are very appropriate measures to take to help protect yourself and be living a healthy lifestyle.

Scott Redding: There's been a lot of news about HPV in recent days and even in the last few months. You briefly mentioned earlier about the extended age to 45. What about new guidelines for women as it relates to getting the HPV vaccine?

Diane Harper: The guidelines are that if you are between the ages of 11 up through 13 years of age you only need two doses of the vaccine. You can take those doses anywhere from six months apart to a full year apart. If you are just going in to your doctor for your annual school visit you can get your vaccine at a year apart. Both of those doses.

Once you reach 15 years of age the evidence shows that three doses of vaccine is probably going to be needed. Then at that point we ask you to get your dose, get your second dose in two months, and your next dose in six months. That gives you really good protection and it lasts for at least a decade and we hope longer than that.

For women who are older, so are women greater than 26 years of age, it's the same three doses. The same three doses and the same schedule. They come in and get it. They get their second dose one to two months later. They get their next dose at six months from the first dose. Then that allows them protection.

Scott Redding: Does it replace any other screenings or is it in conjunction with other screenings as it relates specifically to cervical cancer?

Diane Harper: For cervical cancer because we're going to a primary HPV test as screening for cervical cancer, when women get a negative HPV screen, that means they're not infected with 14 high-risk HPV types, and when they have that result they are at a perfect place to then start their vaccination series. They know that they don't have anything at that moment and the vaccination series will then protect them going forward. That's a good time to do that.

Because their HPV screen was negative at that point, they're also safe for five years before they repeat their screen. It's important to know that that's a longer interval but that longer interval is very safe because it takes that long for an HPV infection to actually cause any harm that could be detectable at any point in the future.

We think that we'll actually reduce the number of speculum exams that a woman has to have in her lifetime down to probably less than 10 as we move to this new primary HPV screen.

Scott Redding: As we wrap up, if there's one, two things that you would like listeners to walk away from what would that be?

Diane Harper: The first would be do not be afraid of HPV but attack it full on. You can attack that by use of condoms, like we discussed, as well as vaccination. And for women, to make sure you encourage your moms, your girlfriends, your wives,

your sisters, to make sure they stay in the screening program and they stay in the screening program through the age of 65. As women are starting to live longer we may eventually extend that but for right now we want to stay in the screening program until they're 65 years of age.

Scott Redding: Great. Well, thank you for taking the time today, Diane.

Diane Harper: Yeah. Thank you. It's been fun. It's been great. I appreciate it.

Scott Redding: Thank you for listening. Tell us what you think of this podcast by rating and reviewing us. If you have suggestions for additional topics you can send them to Cancer Center at Med dot U Mich dot EDU or message us on Twitter at UM Rogel Cancer. You can continue to explore the 3Ps of cancer by visiting Rogel Cancer Center dot org.