Sawbones 288: The HPV Vaccine

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Intro (Clint McElroy): Sawbones is a show about medical history, and nothing the hosts say should be taken as medical advice or opinion. It's for fun. Can't you just have fun for an hour and not try to diagnose your mystery boil? We think you've earned it. Just sit back, relax, and enjoy a moment of distraction from that weird growth. You're worth it.

[theme music plays]

Justin: Hello everybody, and welcome to Sawbones, a marital tour of misguided medicine. I'm your co-host, Justin McElroy.

Sydnee: And I'm Sydnee McElroy.

Justin: And I'm Justin McElroy.

Sydnee: Still.

Justin: Still. Consistent.

Sydnee: That's good.

Justin: That's what people want in a podcast host. Consistency.

Sydnee: To remain Justin McElroy throughout the entire podcast.

Justin: Observe me, or do not observe me – I am still Justin McElroy.

Sydnee: Justin, I have a story for you. [pause] Are you ready?

Justin: Yes.

Sydnee: You don't say—I mean, you didn't respond. Like, you didn't say, "Great!" Or, "Woohoo!" Or, "Oh, I love stories!"

Justin: The idea that I would halt a story from you is beyond comprehension. I just thought that was assumed.

Sydnee: Uh-huh. Uh, this story was from Rileigh, my sister.

Justin: Mm-hmm.

Sydnee: She told me the other day that she was driving a van full of fellow college-age students, and they were discussing a vaccine. And whether or not some of them who had not yet received the vaccine should get the vaccine. And she shared with me this disturbing story of one of the students telling everyone else that she knew this vaccine was secretly dangerous, and if they hadn't gotten it already, don't, because there are all kinds of side effects that people didn't know about and were hidden, and you shouldn't get it.

Justin: Now, if you're a long time listener to Sawbones, at this point, you've probably guessed where we fall on this. But I'm eager to hear more.

Sydnee: Well, I mean, I suppose… no, there's just nothing. I always try to like, see the other side of things. But there's not here. There's not another side of this. They were discussing, as you may have guessed, the HPV vaccine. Now, I will say, today in 2019, I could've been talking about any of the vaccines. [laughs]

Justin: Heartbreakingly, yes.

Sydnee: Sadly, all vaccines have been called into question by people who don't know anything about vaccines. They are still, by the way, safe and effective. Trust everyone who knows anything about vaccines.

Justin: Trust us. Still great. Hey, listen. Go buy the t-shirt on McElroyMerch.com. It says, "Vaccines: Safe and Effective since…" I think

1796. We just actually donated—I mean, we didn't, you all did by buying the shirt, two thousand dollars towards vaccine awareness.

Sydnee: Mm-hmm. Education and combating exactly this kind of misinformation that threatens public health and safety, as well as the health and safety of the college students inside the van that my sister was driving.

Justin: Yes.

Sydnee: So I want to talk about human papilloma virus, HPV, and the vaccine. Because even though it doesn't have a—it's not a very old history that I want to go through.

Justin: Like in our lifetime, right?

Sydnee: The vaccine is in our lifetime. The history of HPV is…

Justin: Well, obviously. Yes.

Sydnee: Before our lifetime. But I feel like of all the vaccines, this one, and maybe the flu… these two are the ones that people want to debate the most.

Justin: Mm-hmm.

Sydnee: Everything else, it's kind of—it's like an all or nothing. They're either all in or all out. But these are the two that I'll find, even the most staunch vaccine advocates will, for some reason, hesitate when it comes to the HPV vaccine. And there is no reason to do that. And so, I thought it was worth talking about.

Because the vaccine to prevent high-risk types of human papilloma virus is really a landmark vaccine. Do you know what differentiates it from other vaccines, Justin?

Justin: Uh, well… no.

Sydnee: In a good way. This is in a good way.

Justin: Oh, okay! No.

Sydnee: [laughs] What it can do that most vac—that other vaccines really aren't aimed at doing… it can prevent cancer. Which is, y'know… a big deal.

Justin: That seems huge. That seems awesome to me.

Sydnee: Right? We live in a time where we still, while we do have some effective cancer treatments, we don't have a one shot cure for cancer. We don't have a, y'know, works every time, every cancer, every stage way. We still—there's a lot of unpredictability and a lot we have to learn. And so, something that could prevent cancer before it starts… I mean, when the HPV vaccine first came out, this should have been, like, a triumphant moment in human history where we all came together and held hands.

Justin: Kumbaya.

Sydnee: Brought our young people, 'cause this vaccine is targeted mainly at children; although, we'll get into that more than children can get the vaccine. Brought all of our children to their doctors immediately to get their vaccines, and then cracked open a bottle of sparkling grape juice. For the kids.

Justin: For their kids. 'Cause their kids are there.

Sydnee: And celebrate. But that didn't happen.

Justin: [gasps]

Sydnee: Because of a lot of misinformation, and probably some sex stuff.

Justin: [laughs]

Sydnee: HPV is responsible for almost all cases of cervical cancer. Which I think we—most people have heard by now?

Justin: Yes. I would hope people know that at this point.

Sydnee: It's also responsible, by the way, for 95% of anal cancers.

Justin: Yeah, don't hear that stat as much. You don't hear that brought up as many times.

Sydnee: People—when the vaccine was released, it was really targeted at preventing cervical cancer, even though, as we'll talk about, it is not the only cancer that the vaccine can prevent. That was kind of the big marketing angle, I would say. Uh, HPV is the most common sexually transmitted disease, and more than 79 million Americans have human papilloma virus, and most people have no idea.

Because it's one of those viruses that can just be there, and not necessarily do anything to you. There's not a reliable test that we do for HPV. It's not like I can just go like, give you a quick HPV screen and tell you whether or not you have it. There are a lot of different types. There are a hundred types of HPV.

And when we're talking about human papilloma virus and HPV, most people think… I'm trying to use those terms interchangeably enough that I can just say HPV for the rest of the—is that okay to do?

Justin: I think that's fine.

Sydnee: Is that fine at this point? I was trying to reiterate that enough so I could just say HPV. Uh, there are about 60 that just cause warts on non-genital places.

Justin: Okay.

Sydnee: So if you have a wart on your finger, that's caused by an HPV. A human papilloma virus.

Justin: But I had warts on my finger before I was… if I may… sexually active.

Sydnee: Well, that is because, Justin, not all types of HPV are sexually transmitted. The types that cause a wart on your finger are just from touching things. With the virus.

Justin: Frogs, right? I knew that much, at least.

Sydnee: No. [laughing] Not frogs.

Justin: Darn it.

Sydnee: Other warts. Or other people who have the virus. I mean, it's spread by contact that isn't necessarily sexual. Now, there are 40 that are sexually transmitted, and can cause various manifestations in the genitals. Uh, the lower risk things—like, specifically strains six and 11. And these numbers aren't super important until we really get to the vaccine, which is why I mention them.

But the lower risk strains cause about 90% of genital warts. So, genital warts, uh, are not… they don't develop into cancer, almost ever. Almost ever, any kind of wart-like growth is gonna develop into cancer. So that's why we call them low risk.

Justin: It's important to establish that, because so many people have HPV, I don't want people to think it's like, a death sentence.

Sydnee: No. No, no, no. And certainly not if you have genital warts. Genital warts, they often, like, they're the little wart-like growths that often look like cauliflower, which a lot of warts can, outside of the genitals. They can start to get that appearance. They show up weeks or months after you've had sex with somebody who was also infected, if it was transmitted. And they're usually treatable through other, either mechanical methods like removing them, or there are medications, and that kind of thing.

These were not the reason, I would say, for the development of the vaccine. While they are… I mean, most people don't want to have them, they're not

life threatening. There are certainly much worse things. Y'know, like the high risk strains.

Justin: Unless you're a genital model, in which case they could be livelihood threatening.

Sydnee: Well, that's fair. That's fair. And I mean, I'm not—I shouldn't downplay that. There's a lot of, uh, personal, like… there's a lot of stigma associated with any kind of sexually transmitted infection.

Justin: Sure.

Sydnee: And so, there can be a lot of self-esteem issues, and body image issues related to them, even if they're not necessarily painful or causing—

Justin: We're not saying it's good to have genital warts. Sawbones has been very clear about this from the beginning.

Sydnee: I don't want to downplay the impact that can have on your quality of life.

Justin: Of course, yeah.

Sydnee: The high risk strains are what we're concerned about when it comes to cancers. So, mainly 16 and 18. There are some other high risk strains that are less common and less likely to cause cancer, but are out there, and they cause about 70%—that 16 and 18 alone cause 70% of cervical cancers. And then when you add in all the other ones, the majority of cervical cancers come from this.

Cervical cancer is the second most common, and fifth leading cause of death of people who have cervixes worldwide.

Justin: That's terrible.

Sydnee: It's a big deal. It's a big problem. And not just cervical cancer can be caused by human papilloma viruses. Penile cancer, anal cancer, vaginal

cancer, vulvar cancer. And then, one that is often not mentioned – a lot of people associate it with different—with the genitals. With everything below the waist. But there are oropharyngeal cancers, so cancers in the back of the mouth, like at the base of the tongue, or tonsillar cancers. There are cancers that you can get there from human papilloma viruses.

So uh, you don't have to have a cervix to be concerned about this.

Justin: Right. Fair.

Sydnee: Now, this idea that a cancer could be caused by a virus first originates in the 1950s and '60s. Um, we—prior to that, you wouldn't necessarily assume that, right? We didn't know what caused cancer.

Justin: Yeah, that's a big jump. 'Cause you would think—the idea that a certain thing could do two things that seem unrelated, I think, would be a complex idea for us now, even today, let alone way back in the annals of history.

Sydnee: It really—I think when you read stories like this, it's a testament to how, uh, while you need… I talk so much about evidence and fact, and like, the scientific method. But I think that all science is aided by having some creativity, some imagination and ability to—

Justin: Lateral thinking.

Sydnee: Yeah, lateral thinking. And then apply the scientific method to those ideas to get to the truth. Uh, but I think that is how that led people to begin, researchers in the '50s and '60s, to begin to notice, um, a strange observation. That if you looked at the age at which people started having sex, their first, y'know, sexual encounter, cervical cancer seemed to be more common among people who had their first sexual experience at a younger age, and had a higher number of sexual partners.

Justin: Okay.

Sydnee: Which started to connect the dots where, is this some sort of, y'know, contagious thing? And that's—that was weird, the idea—I mean, cancer isn't contagious. I mean, why would we be seeing this? You can't catch cancer.

Justin: The only alternative is that too much sex gives you cancer.

Sydnee: Right. [laughs] Which it does not.

Justin: We did not go that route, thank goodness.

Sydnee: No, no, and I am not saying that. I'm not saying too much sex causes cancer. I would never say that. Uh, but it began to… this is—y'know, it's funny, because you've got to look at like, as our microscopes got better, and we started to understand, first, germs were a thing, and bacteria were a thing. And then we could see smaller things, 'cause viruses are smaller. So then, eventually, we saw viruses.

And so, then, in that—like, that's already in the cultural kind of concept among all these scientists. And now, all of a sudden, wait, cancer being contagious? No. But y'know what is contagious? A virus would be contagious.

And this is where we get to German virologist, Harald zur Hausen, who had already noticed an association between a different virus, Epstein-Barr virus, EBV, which can cause certain kinds of cancer. And I want to be very clear – this does not mean that if you had mono, or have mono, or have ever been diagnosed with mono or EBV, that you are at risk for cancer.

Justin: Mm-hmm.

Sydnee: Much like HPV, there are many different types of EBV. So I just want to… a lot of people have heard of EBV, and I don't want you to freak out when you hear that. But he had noticed these associations. And so, he started thinking, "I wonder if there's something here with the cervical cancer cases. I wonder if there's some similar kind of…"

Justin: Yeah. There's a correlation there. Maybe it's the same thing.

Sydnee: Yeah, maybe there's a connection. Uh, and the thing that got him interested in specifically papilloma viruses… because we already, at this point, knew of the existence of these wart viruses. The viruses that cause wart on your hands, and the viruses that were causing warts on the genitals. Uh, he had heard, through some different researchers, that perhaps there was a higher rate of this cervical cancer among people who also had genital warts.

Justin: Okay.

Sydnee: Uh, this… if this correlation existed, it's interesting, 'cause I guess if it did, it would just be that they would be infected with two different strains.

Justin: Oh, 'cause it doesn't cause…

Sydnee: The strains that cause genital warts are different from the strains that cause cervical cancer.

Justin: Oh, I don't think we clarified that. That's good to know.

Sydnee: Mm-hmm. Um, but, there was this correlation. And I mean, maybe we're talking about people who are exposed to multiple sexual partners, or something. Who knows what this group of—this cohort was. However, they got this idea. It turned his interest to papilloma viruses.

And uh, there was some research from the '30s that suggested that there was a certain type of papilloma virus that caused both warts and cancers in rabbits. And so, this led him to investigate papilloma viruses. And so, he started out first with HPV6, which is one of the ones I've already mentioned can cause warts. And he came up with nothing there. Right? Because as we already covered, it caused the warts, but it didn't cause cervical cancer.

So, he started there, and that led him to check other strains of HPV. And he finally was able to, in 1983, connect HPV11, strain 11, with some cases of

cervical cancer. But that wasn't enough. That was good. It was intriguing evidence. Uh, researchers all began to turn their interest to HPV, but it wasn't enough to, y'know, say that this was causation.

So he went on next to study different types of HPV, specifically HPV16, and then 18. And that was really when he, y'know, struck gold from a research perspective. Because now, he had stumbled upon the two types of HPV that are linked with the majority of cervical cancers.

Justin: I have a question to ask you, and you may not know the answer, but um… why is it called the human papilloma virus? Doesn't that go without saying?

Sydnee: Usually, when you see a 'human' whatever virus, it's because there is also a similar type of virus that can only infect some other species other than humans. In this case, bovine papilloma virus is a thing. So… that's cows.

Justin: I know. Yeah, I know that. I don't know medical stuff, but like, I knew about that.

Sydnee: You had a blank look that—

Justin: Well, in my head, I was thinking about, "Well, we should just call ours papilloma virus, and call theirs bovine papilloma virus, because we get to name everything. Seems weird to put—" But I see how… that's a bit… that might be confusing for people. Because if you don't say human, then if you're at like a dinner party with a bunch of, um, nerds… if you say papilloma virus, then they'll ask you, "Excuse me, uh, are you speaking of are human papilloma virus, or a different strain?"

Sydnee: Or the bovine?

Justin: "Or the bovine? I have a funny joke—here's a funny 15 minute anecdote about bovine papilloma virus!"

Sydnee: [laughs] I am going to get into bovine papilloma virus before this is all over, but… uh, no. I would say that that's probably more related to the fact that, at least from my perspective, the more you study science, uh, the less convinced you are of the superiority of the human race to all other species on earth.

Justin: Okay. Fair.

Sydnee: And so, I think that just taking papilloma virus and assuming human is a level of um… that's uh, a level of ego I don't know that we're worthy of. Is that fair?

Justin: Fair enough.

Sydnee: Okay. So anyway, he—once he turned everybody onto this idea that linked HPV to cancer, uh, there were—people all over the world started doing the same studies. And first, there were studies from 22 different countries that linked cervical can—93% of cervical cancer to HPV. And then in '99, they did a bigger study, and eventually came up with 99.7% of cervical cancer samples that they checked in this study contained HPV.

Justin: That's wild.

Sydnee: So almost every single case of cervical cancer came from HPV.

Justin: That is wild.

Sydnee: So, this was… this was when we finally said, this is definitely—yes. Yes. We have done the research, we've proved it. There are lots of different kinds of HPV. They zeroed in on the ones that were responsible for most cancers, and were most dangerous to get, and then began to understand other things about this that, even if you have a high risk HPV, um, you might, like—you might test positive for it, but not everybody gets cancer from it. That's an important thing to know.

'Cause I've already said, so many people have HPV. You'd think, well, everybody would be getting cancer from it. Well, no, 'cause even if you get

16 or 18, one of the high risk strains, sometimes your body clears it. Sometimes you will develop some pre-cancer lesions, and then that will clear up on its own.

Uh, and we know all of these different things, the way we learned all of kind of the stages. How does it go from, "I got the virus in my body," to cancer. What all is involved in that transition? We learned a lot about that, because of Dr. Papanikolaou and his famous smear. We've already talked about him. We did a whole episode about the pap smear.

Justin: We're not pivoting into a long section about Dr. Papanikolaou.

Sydnee: No. But then, this led to, once we had the development of the pap smear, we could take all this information where we connected HPV to cervical cancer, and learn a lot more about, y'know, this transition from one to the other. And it's worth noting that, in 2008, uh, zur Hausen won a Nobel Prize for this.

Justin: Yay!

Sydnee: For this connection. So this is great. Now, we know that the majority of cervical cancers, and some other cancers, are caused by HPV. We know it.

Justin: Huge. Huge.

Sydnee: We know which strains. And, we've got a pap smear. And if we use pap smears well as a screening tool, if people get their pap smears, everyone who should get one, if they get them when they should, we can detect early changes that indicate a cancer could be brewin'. And we can prevent death from cervical cancer. And that is exactly what happened with the pap smear. We prevented—we caught a lot more precancerous lesions, and we prevented deaths.

And this was all excellent. But what's better than catching cancer early and preventing it from progressing?

Justin: Stopping it in the first place.

Sydnee: That’s right, Justin.

Justin: Thank you.

Sydnee: And I'm gonna tell you how we did that. But first, let’s go to the billing department.

Justin: Let’s go.

[theme music plays]

Justin: Folks, our first sponsor this week is MeUndies. MeUndies is here to change your underwear. No, Sydnee, not literally. They want to change the underwear game. They want you to take your old underwear, throw them in a fire, and buy a bunch of new ones. And—okay, wait for the new ones to arrive first, and then put all your old underwear in a fire. Not you personally, because all your underwear are MeUndies. But other people listening to this.

MeUndies are soft. They have fun patterns. And they let you feel free. MeUndies are incredibly comfortable. They’re almost all that Sydnee and I wear. We adore them. Uh, and the patterns are fun. We look forward to—we have like a subscription, because we’re best buds, and they send us the new prints every month, and they’re always so cute. Last month it was like, pizza. It was adorable.

Sydnee: Mine came with a matching bra.

Justin: Pizza panties, folks. You can't beat it.

Sydnee: And I loved it.

Justin: MeUndies has a great offer for our listeners. For any first time purchasers, you get 15% off and free shipping. That’s a no brainer, especially ‘cause they have a 100% satisfaction guarantee. So to get your

15% off your first pair, free shipping, and a 100% satisfaction guarantee, go to MeUndies.com/Sawbones. That's MeUndies.com/Sawbones.

Sydnee: Hey, Justin?

Justin: Yes, Sydnee?

Sydnee: Do you want to discover your inner chef?

Justin: I believe I already have. It's a little rat that sits on my shoulder and moves my hands for me.

Sydnee: That is not what that rat did in that movie.

Justin: That is what he did. He controlled his human puppet.

Sydnee: No, he was under his hat. And he just told him.

Justin: He controlled his human puppet.

Sydnee: I guess he did pull his hair…

Justin: Yeahhh.

Sydnee: Anyway, I'm not talking about Ratatouille. I'm talking about Blue Apron. [laughs]

Justin: Makes one of us.

Sydnee: I know, I know that that can be confusing.

Justin: Coming to France. The World Pavilion. 2021.

Sydnee: What I'm talking about is, uh, how Blue Apron has a menu that is carefully designed and tested by their test kitchen chefs, and they will send

you unique, specialty ingredients, easy to follow recipe cards, everything you need to create wonderful meals… wonderful.

Justin: Wonderful.

Sydnee: Wonderful. Uh, for you, your family, your friends, all for you, if you want. Whatever. They're not judging. You just—they're just sending you all these great ingredients, easy to follow instructions—

Justin: Eat a whole box of asparagus. What do they care?

Sydnee: [laughs] Uh, and you can make delicious, brag-worthy meals at home without the hassle with Blue Apron. And you can check out this week's menu and get $60 off when you visit BlueApron.com/Sawbones. That's BlueApron.com/Sawbones. Blue Apron: A better way to cook.

Justin: I have a quick word from Squarespace. Websites.

Sydnee: That's it.

Justin: You want longer? Okay, good. You gotta make one. You need one. You're wasting your time in life if you don't have a website to accompany your life. Your life's journey. What do I mean by that? You can showcase your work, blog or publish content, promote your physical or online business, or your life. Tell people how it's going. It's a holiday card that lasts all year long, and you're the webmaster this time.

They got beautiful, customizable templates created by world-class designers that let you pick the best things in your life and put them on the website. And leave the sad stuff out, folks. This is primo content on this website.

Sydnee: Unless you want to put the sad stuff in. That's up to them.

Justin: That's up to them.

Sydnee: Don't tell them what not to share on the internet. They can share whatever they want.

Justin: Squarespace doesn't allow any sad content. That's one of their word rules.

Sydnee: That's… mm, no…

Justin: That I've asked them to change. And they've just changed it. They actually just told me.

Sydnee: Okay, there we go.

Justin: They've got built-in search engine optimization and 24/7 award-winning customer support. So, go to Squarespace.com/Sawbones for a free trial, and when you are ready to launch, use the offer code 'Sawbones' to save 10% on your first purchase of a website or a domain. I should make a website about talking good, and how to do it better…er.

Uh, Sydnee, you were going to tell me about our battle against, uh, HPV.

Sydnee: So, as I already mentioned, bovine papilloma virus was kind of the early—one of the early keys to our success in creating a vaccine against human papilloma virus. Because we had been, in the veterinary world, our veterinary colleagues were looking for a vaccine to protect cows from getting, I guess, BPV, 'cause it can cause tumors, since like the '50s.

And all of this kind of body of research that already existed to try to create this cow vaccine was helpful when they started working on a vaccine for humans. The first—they noticed that there was a molecule that was very similar to a corresponding molecule in the human papilloma virus 16 that could protect cows from getting the bovine form. And that was kind of an early breakthrough. So they used this cow science, and they applied it to humans.

Justin: Cow science doesn't get enough credit. Just because they're too big to wear lab coats doesn't mean that cow science should be neglected by us humans. It's egotistical.

Sydnee: [laughs] I like—

Justin: Haven't you people ever seen The Far Side?

Sydnee: That's true. Those cows are doctors, and…

Justin: They're geniuses!

Sydnee: Scientists, and all kinds of different things. Uh, I like this science, because it was altruistic on both counts. We wanted to protect cows, and we wanted to protect humans, and we get vaccines for both. Uh, if we're gonna give credit to some scientists for the vaccine, uh, there were some—there were two docs, two scientists in Queensland, Australia, who… and I mean, this is… it's one of those things, any big discovery, you can probably find a little bit of controversy over.

So the two scientists that are usually credited are professor Ian Frazer, and Dr. Jian Zhou. These two Australian scientists made this great vaccine, and basically, after that, companies started… this is one of those where, I like the stories where we talk about how nobody patented it, they just gave it out to everybody for free. In this case, yes, people patented it and started… [laughs] Producing it.

But somebody had to make the vaccine. So, they started, uh, rolling out the vaccine in 2006. The first one came out, that was Gardasil.

Justin: Okay, I've heard about that.

Sydnee: Mm-hmm. And that protected against strains six and 11 that cause the warts, and 16 and 18 that can cause cancer. In 2007, another vaccine, kind of a competitor, came out from a different company called Cervarix that only protected against the cancer causing strains, 16 and 18. And the reason is, it was more just like… they thought, one, at first, they thought it was a little more effective than Gardasil. And two, they were targeting the real, what they kind of considered the real problem.

I think in most places, Gardasil has overtaken Cervarix due to cost effectiveness issues.

Justin: Okay.

Sydnee: They're both very effective, I should say. And then uh, most recently in 2014, Gardasil-9 came out, which protects against—it's the same vaccine in that it protects against the original four strains, but it added five more strains of potentially cancer-causing HPVs to it. So it's same idea, just covers against more strains.

Not unusual for vaccines. The flu vaccine you get every year covers against multiple strains of influenza, and it changes every year, so…

Justin: Perfect.

Sydnee: Uh, so, they started vaccine programs in a lot of different places. Australia was one of the early places that they started them. Uh, Scotland, Denmark. Eventually, of course, in the US, we started manda—not mandatory vaccination programs, but like, routine. Recommending them, I should say, as routine parts of childhood immunizations.

Initially, this vaccine was only recommended for, uh, people aged nine to 27 who have a cervix.

Justin: Cervices, right?

Sydnee: Cervices, yes.

Justin: Cervices? Okay, that is confusing to me.

Sydnee: Yes.

Justin: Because. Everybody's—pretty much everybody has an anus.

Sydnee: [laughs]

Justin: And it causes 95% of anal cancers.

Sydnee: Yes.

Justin: Well…

Sydnee: It's a great—it's a great point.

Justin: Yeah.

Sydnee: Yeah. And I mean, part of it is that the early studies were only aimed at people with a cervix. And there's this kind of, uh… I've talked about it before, I think, on the show. Even if we know that the vaccine would work in somebody who doesn't have a cervix, if we haven't done the study, we can't just say it. We have to do the study.

Justin: Okay.

Sydnee: And the early programs were really targeted at reducing rates of cervical cancer alone. Which, you're right – I mean, we can argue the ethics of that, and was it shortsighted, and—

Justin: Well, to say nothing of herd immunity. I mean, more people vaccinated means, y'know, slower contagion rates.

Sydnee: Exactly. Exactly. And all these reasons are why—and one thing I should note. You also have to remember that because, especially when these vaccines are being made by, y'know, for-profit companies, they're also constantly doing cost effectiveness. And some of the early studies suggested that it was most cost effective to just vaccinate people with a cervix.

Justin: Hm.

Sydnee: But, you are right. You're leaving everybody who still has all of the other parts that I said can get cancer from HPV, even if it's rare. 'Cause it is rare. Like, penile cancer from HPV, that's extremely rare.

Justin: 95% of anal cancers.

Sydnee: Yes. I'm just—I mean, we're talking about more rare than cervical cancers, would be the… I'm not making this argument. I'm telling you what was in the minds of people who made these guidelines.

Justin: Okay. That's fine. You're off the hook.

Sydnee: [laughs] I would not make this argument. I would say that, uh, the more the merrier. And indeed, they did do the studies to prove that, of course the vaccine is safe and effective for people who do not have a cervix as well, for people with penises, for people with anuses, for people with vaginas, people with a vulva… what else did I mention? People with—

Justin: People with a Volvo.

Sydnee: --an oropharyngeal area. So, people who have a mouth and a back of their mouth. That's pretty much—I mean, that's…

Justin: Almost everybody.

Sydnee: Almost everybody.

Justin: Yeah.

Sydnee: That it's good for all those people. And then they did studies further to prove that not only is it not restricted to people with a cervix, it shouldn't be restricted to people under age 27. When we kind of look at that age, like, why was that chosen? Again, you have to look at like, risk-benefit ratios, and cost effectiveness ratios. That's what determined those early things.

The thought was, most people, by the age of 27, have been exposed to HPV if they're gonna. So, there's no point in vaccina—'cause once you've been—once you have it—

Justin: They're done having all their sex. [laughs]

Sydnee: [laughs] They're done—well, what they would say is, they're done having their sex with new partners. And I would say that that's not true. And that if you want to get the vaccine after age 27, there's no reason it's dangerous. But again, we had to do the studies to prove that, and now it is approved from ages nine to 45. So, they gave a wider dosing range.

Justin: Okay.

Sydnee: Since they have started these vaccination programs, the last numbers I have are from 2017 that said about half, a little under half of adolescents were up to date on their HPV vaccine series.

Justin: Could be better.

Sydnee: Um, 66% of people between the ages of 13 and 17 got their first dose. I would say that part of the problem with this is that initially, there were three doses. Now, if you get it before age 15, you can get away with two. That's enough to create immunity. But that was part of the problem.

And they—you will note, the CDC is proud of pointing out that, uh, between the years 2013 and 2017, uh, the percentage of adolescents who started the HPV vaccine series has increased by five percentage points each year.

Justin: Good!

Sydnee: So like, it's getting better. And since that time, we've seen results. Among teens with cervixes, infections with HPV types that cause most of the cancers and warts have dropped 86%. Among young adults with cervixes, that number has dropped 71%. And when you look at people who have received the vaccine, the percentage of cervical pre-cancers caused by HPV types has dropped 40%.

Now, we're not gonna see the change in cancer diagnoses yet. Because it takes a long time, usually. Usually. Not always. But usually, it takes a long

time from the moment you're infected with a high risk strain of HPV to when that actually becomes cancer.

Justin: Okay.

Sydnee: And so, we're going to have to vaccinate a generation, and then watch that generation grow up, and see rates of cervical cancer among them before we're really able to see the full impact of the vaccines. So if you see—I saw one study that – or one headline, I should say, not study – that suggested that rates of cervical cancer are still going up, despite the vaccine. And it… that—yeah, that may well be true, but we're not seeing the effects of the vaccine yet.

Justin: Right. So why is this contentious, Syd?

Sydnee: I think part of it are normal vaccine fears. Right? Right now, we are, uh, going back in terms of our… enlightenment. We're re-entering a dark ages of sorts, or we're in the midst of one, where science is being called into question based on this general mistrust of… everything? This idea that there is no truth, that all is opinion.

And so, you're seeing a lot of concern about like, it's a vaccine, and vaccines are unnatural, and vaccines have secret chemicals, and blah blah. All that propaganda that is completely false, and y'know, that's hard to… to disrupt, just because it's just wrong, and it's hard to say anything other than that. I think that's part of it.

I do think that the sex thing is the other part of it. HPV, the HPV that we're concerned about, is sexually transmitted. And in my personal experience, the protests that I usually hear are, "But my kid doesn't have sex."

Justin: Right.

Sydnee: And that's the whole point of why we vaccinate so young. So, generally speaking, you can get it starting at age nine. It's on the vaccine schedule, usually around 11. That's when most of our patients were re—we recommend the vaccine to them. Age 11. Uh, and I think it's fair to say that,

at this point, at least in the US, the majority of 11 year olds are not sexually active.

Justin: Right.

Sydnee: And that's exactly why we should give them the vaccine.

Justin: Right.

Sydnee: Because once they've become sexually active, they could have been exposed to one of these strains of the virus. And if you've already been exposed, it's too late to—I mean, I would still recommend the vaccine, 'cause there are other strains in it. But we can't protect you against that one, now.

Justin: Well, and it's—if you—I mean… you would be, if you wait until your child is of a sexually active age, you're putting them in a position where it's like, well, now we have to talk about… like, before you're sexually active, make sure you come talk to me about it so we can make sure to get you the HPV vaccine. Like, no kid is gonna do that on earth.

Sydnee: It's a very strange thing to me, because if I—I've tried to walk down that road and say, okay, but what if you knew your kid was gonna start having sex tomorrow?

Justin: But they won't.

Sydnee: That's usually the response I get.

Justin: [laughs] Right.

Sydnee: And some of that is coupled with this idea that if we start vaccinating everybody against sexually transmitted infections, they won't be afraid of sex, and they're more likely to have sex. I think we know, there's tons of data to say that's not true.

It’s the same idea that if you give people access to birth control, or you give people access to abortion care, or you give people access to condoms, that they’re going to be more likely to have sex. And that’s not true. They’re more likely to engage in safe sex, and they’re less likely to get sexually transmitted infections in these cases. That’s what the statistics have borne out.

People are either gonna have sex, or they’re not, and getting a vaccine is certainly not gonna make that difference. Some if it is, I just think parents don’t want to have that conversation. It’s another vaccine. Their kid’s gonna fight them. Um, they don’t want it. They’re not having sex anyway. I don’t want to worry about this right now. Please just—I don’t want to talk about it.

Justin: Yeah.

Sydnee: And then part of the fault is us, healthcare professionals. Doctors.

Justin: Oh, not you and me.

Sydnee: No. Well, me included. I'm a doctor.

Justin: But not me.

Sydnee: Part—what they’ve found is that doctors tend to, because of all these issues, they tend to spend less time discussing HPV vaccines. We tend to throw it to the end of the conversation, after we’ve talked about a Tdap, or a meningitis vaccine, or a flu vaccine. The last thing we want to do is the HPV vaccine. And we are not as staunch advocates for it. Even though we know it’s safe and effective, just like all the other vaccines, we don’t sell it as well. I mean, there’s data to support this.

Justin: It’s like you're pitching the clear coat right when the person is trying to take their new car off the lot. Like, no, I'm not getting the windshield insurance, and I'm not getting any of that, just… just please let me go.

Sydnee: Uh, a lot of the—when they ask parents why they refuse to let their kid get the vaccine, a lot of their answers were that they really didn't know much about it, or they didn't think it was necessary. I mean, the—or that their kid wasn't gonna have sex.

The last fears were safety, honestly. And that was on the list. I'm not saying they aren't fears. Safety concerns were on the list. But it doesn't seem to be that people think it's more dangerous. It seems to be all this other social stuff around it that is the big—one of the big barriers.

In terms of the safety stuff that has arisen, 'cause there's a lot of… I mean, it's just—frankly, it's misinformation. It's untrue. There are no increased risks with the HPV vaccine, compared to any of the other vaccines that you get in your routine childhood vaccination schedule. Uh, the most common reactions are the same as literally every shot you're ever gonna get. Pain, redness, swelling at the injection site.

There were some early concerns that we were seeing a slightly higher rate of people passing out when they got it. Like, when they got the vaccine. 'Cause that's always a risk, right?

Justin: Mm-hmm.

Sydnee: When I take your blood, if you see blood, if I stick a needle in your arm…

Justin: Might pass out, yeah.

Sydnee: Some people pass out. It's a vasovagal response. Some people just do it. I'm glad I didn't, or med school would've been hard.

Justin: [laughs]

Sydnee: But there was a concern initially that, was there a higher rate? Even that has not been borne out by the numbers. We still warn that. When I give the vaccine, I still say, "After we give it to you, we're gonna have you sit here in the office for a few minutes. Don't stand up right away. Just make

sure you're feeling okay, you're not lightheaded or dizzy." Simply 'cause we don't want people crashing to the floor.

But nothing dangerous. There's no other… anything else you read is entirely unfounded. The HPV vaccine has proven, since its inception, to be safe and incredibly effective in preventing cancer, which is revolutionary, landmark, should be cause for celebration. I mean, I personally gave my sister Rileigh one of her Gardasil shots. [laughs] One in her series. I personally administered it to her at the office, 'cause she was so scared.

I would do it, uh, for myself. I would do it for my own children when they're old enough. I would recommend, if you have somebody in your family who is anywhere from nine to 45, they can get the vaccine.

Justin: I'm gonna go get me one too, Syd.

Sydnee: You can get it, Justin. You can get it now.

Justin: Let's go! Let's wrap up this episode so I can go get my Gardasil!

Sydnee: Still get your pap smears. If you're someone who should get a pap smear—

Justin: Okay, fine. That's gonna be a longer conversation, but I think they… I mean, I'll try.

Sydnee: [laughs] I always like to throw that caveat in there. A lot of people ask, like, "Well, once I get it, do I not have to get pap smears?" No. Because as I mentioned, even though it is incredibly effective at preventing cancer, it is not 100% effective. And so, it is still worthwhile to get your pap smears.

But y'know, the thing is that like, things will change as we hopefully see a higher and higher rate of people receive the vaccine. And we see lower and lower rates of cancer as a result. So, there's no reason to be scared. If you have people who are scared, refer them to this episode. Get the vaccine.

Justin: We'll sort it all out. Uh, folks, thank you so much for listening to our program. We hope you have enjoyed yourself. Um… we, uh… we really appreciate you tuning in every week. If you like our show, it'd be great if you could head on over to iTunes, or wherever you listen to podcasts, and leave us a rating or review. It really does help the show, and it'd be super nice if you would take the time to do that.

We have a book called The Sawbones Book. You can find it in bookstores, and online bookstores. There's a Kindle version. There's an audiobook version, if you want to listen to us read the book based on our podcast, in a truly meta moment.

Thanks to the Taxpayers for the use of their song, Medicines, as the intro and outro of our program. Sydnee?

Sydnee: Uh, I want to thank—whenever I find an article that was particularly helpful in putting together an episode, I like to thank the author, Emma Smith, who wrote a comprehensive history of HPV and the vaccine, and lots more than I included in this episode. But thank you for doing all that research.

Justin: If people Google that, I'm sure they can find that piece and check it out. Um, folks, that is gonna do it for us for this week. So until next time, my name is Justin McElroy.

Sydnee: I'm Sydnee McElroy.

Justin: And as always, don't drill a hole in your head!

[theme music plays]

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