Sawbones 49: Vaccines

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Clint: 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 cohost, Justin McElroy.

Sydnee:
And I'm Sydnee McElroy.

Justin:
Today is the episode that the most people have requested from us, but the one that we have been most hesitant to also, uh, do. [laughs]

Sydnee:
Yeah. We don't really have, like, a funny thing to say here, or a bit or anything. We're just kind of gonna, you know...

Justin:
There's no goofs because this is really serious and we didn't want to do the episode because we— when we started this show, we've explained this a couple of times, but just to ram this point home… When we started this show, we wanted to be something that everybody could, uh, could enjoy. You know?

Sydnee:
Sure.

Justin:
Could, could get something out of, could have some fun with and not feel— not something confrontational, you know?

Sydnee:

No. No.

Justin:
There's enough of that in real life.

Sydnee:
Just to inform and entertain, not to, like, challenge your view of the world in any major way. Not that that's a bad thing. I would encourage you to regularly engage in things that do that. But that wasn't really our purpose.

Justin:
So, but here's the thing, kids are getting the measles [laughs] and that's ridiculous.

Sydnee:
And kids are getting whooping cough.

Justin:
Kids are getting whooping cough and it's 2014. I don't— my wife doesn't wear a pretty petit fours. Right? That's the thing?

Sydnee:
A petit fours? I think a petit fours is a desert item, isn't it?

Justin:
Uh. She doesn't wear a, a, a, a, a hoop—

Sydnee:
Petticoat?

Justin:
Petticoat.

Sydnee:
Is that what you're going for?

Justin:
A hoop skirt.

Sydnee:
[laughs]

Justin:
It's 2014. Kids getting whooping cough. That's ridiculous.

Sydnee:
Your knowledge of women's fashion is a whole other issue, but...

Justin:
My knowledge of vaccines is unparalleled. Vaccines is what we're talking about today, on today's episode. And, like I said, we have, we have put it off, like, as hard as we could just because, I don't know, we, we wanted to be a fun show but—

Sydnee:
Well, it's not just that. That's not the only reason that I haven't done it, because I am, I'm happy to tackle a subject that's a little more controversial if it fits our theme well. What's hard about this topic, and we're going to talk about it anyway, is that most of what we cover is stuff that we just got so wrong and it's funny, hopefully, because in the history of medicine we got it so wrong. The history of vaccination is not really that kind of story. We didn't get it so wrong. It took us a while to figure out how to get it just right, but we had a good idea all along. So I don't know.

Justin:
Well, take be back to the beginning, Sydnee. Take me back to the very—to the opening salvo.

Sydnee:
Well, should I tell you what vaccination is just in case anybody's—

Justin:
I mean, I know, but maybe [laughs] there's some listeners that don't fully—

Sydnee:
Oh, you do know?

Justin:
Oh, yeah.

Sydnee:
Do you wanna, do you wanna take a shot at it, or…?

Justin:
Yes. A vaccine—

Sydnee:
That was not a joke. That was not a pun.

Justin:
A vaccine is basically—

Sydnee:
Like, a shot. A shot at it.

Justin:
Uh.

Sydnee:
Do you get it? Shot?

Justin:
Okay.

Sydnee:
Like, a shot. Like, a, you know, a vaccine. A shot.

Justin:
Shot. Oh. Okay. Yeah. Yeah.

Sydnee:
That was my joke that I told.

Justin:
Here is a vaccine.

Sydnee:
It's a pun.

Justin:
It's a pun. Vaccines are basically the Cliffs Notes version of disease. You know how—

Sydnee:

[laughs]

Justin:
... you get assigned Dante's Inferno in high school and then you decide—

Sydnee:
And then you read it and realize, like, gosh, I'm so glad my teachers give me books to read that I wouldn't—

Justin:
No.

Sydnee:
... have tried otherwise.

Justin:
No. No. You don't do that. You get the Cliffs Notes, maybe you get— let me get— use a better example. One from real life. The Deerslayer. Maybe your teacher assigns you The Deerslayer so instead of reading The Deerslayer, you get the Cliffs Notes of The Deerslayer so then when the teacher asks, "Did you read The Deerslayer?" Uh. Then you say, "Oh. Yeah. Yeah. Yeah. Totally. Totally. Totally." But really you just read the Cliffs Notes.

Vaccines are like that for viruses. Your body says, "Did we get chickenpox?" And your body says, "Oh. Yeah. Yeah. Yeah. Totally. Totally. Totally. We totally had chickenpox. Remember? Don't you remember?" And your body, your white blood cells remember something sort of like having chickenpox. That was the vaccine. The Cliffs Notes version of that disease. And so you don't get it again.

Sydnee:
That's actually a pretty good analogy for it.

Justin:
Explosion noise.

Sydnee:
And, similarly to Cliffs Notes, just like at the end you may have avoided, I guess, my example would be reading The House of the Seven Gables.

Justin:
Mm-hmm.

Sydnee:
Thank God. Please don't ever make anyone read that. Um. But instead of that, you've avoided a terrible, possibly deadly disease.

Justin:
Right.

Sydnee:
Which is maybe better.

Justin:
Yes.

Sydnee:
Than, than having to read [laughs] than having to read Nathaniel Hawthorne.

Justin:
Right. They're about, yeah, that's about even Steven there.

Sydnee:
Um. So that's, that's a good description of it, Justin. I will say, just one quick amendment. You said virus, bacteria included and toxoid, just to, just to kind of round it out.

Justin:
Okay.

Sydnee:
There are lots of different ways to make vaccines. But, yeah. So once you get, uh, you probably notice this. Once you get chickenpox, you aren't gonna get it again. For the most part.

Justin:
Right.

Sydnee:
Except for rare cases.

Justin:
Right.

Sydnee:
Once you got mono, you know, the kissing disease, you only get it once and then you shouldn't get it again. Um. And that was something that we recognized a really long time ago.

Justin:
Mm-hmm.

Sydnee:
Like, the Ancient Greeks wrote about how people tended to only get smallpox once, and if they survived it, they were never going to get it again. So they knew something happened in your body that changed after you got— and, and I'm gonna use smallpox a lot because, when we talk about the history of vaccines, we have to talk about the history of smallpox.

Justin:
Mm.

Sydnee:
The two are intrinsically linked for a long time. Um. But they notice, you know, like, well, something happens in your body. We don't really know what it is and we don't know what to do with that knowledge yet, but we definitely know that if we could get people to get smallpox and survive it, they'd be safe forever. What we do with that, we're clueless.

Justin:
Right.

Sydnee:
So just to, just to real quick give you a little bit about smallpox, because I'm gonna talk a lot about smallpox now.

Justin:
[laughs] I'm ready.

Sydnee:
[laughs] And smallpox, thankfully, is something that we're not seeing a resurgence of.

Justin:
Yay.

Sydnee:
Because, as far as we know, it only exists now in two labs in the world. As far as we know.

Justin:
That's something at least.

Sydnee:
It's a pox virus—

Justin:
Am I inoculated for smallpox?

Sydnee:
No. We were not.

Justin:
Oh.

Sydnee:
A standard, standard vaccination against smallpox had, uh, ended by the time we were born.

Justin:
Okay.

Sydnee:
But that was because it was eradicated.

Justin:
Okay. Let's hope we stick with that.

Sydnee:
So it's been around since 10,000 BC.

Justin:
Mm-hmm.

Sydnee:
Um. We have evidence that Ramesses V died of smallpox.

Justin:
Wow.

Sydnee:
We found his pustule covered mummy corpse. I don't know how you figure that out but that's pretty cool.

Justin:
Yeah.

Sydnee:
There's two strains, a minor and a major, and the important thing is that the major strain, variola major, carries a 30% fatality rate.

Justin:
Wow.

Sydnee:
Which is a lot. Um. And that is reflected in the fact that, towards the end of the 18th century, every year, it killed about 400,000 people in Europe. During that time period, a third of all blindness was because of smallpox.

Justin:
Yeesh.

Sydnee:
It was responsible for taking out five sitting monarchs during that time period.

Justin:
Oof.

Sydnee:
Um. And it's worse in kids. 80% of kids who get it die. The major strain. Um. All in all, in the 20th century, between 300 and 500 million people died of smallpox.

Justin:
Oh my god.

Sydnee:

Which, I know that sounds like I'm just laying a bunch of bummer statistics on you, but you need to understand that our fight to stop smallpox was a big deal. [laughs]

Justin:
Yeah. Right. The stakes were very high.

Sydnee:
The stakes were very high and the, the success we had was therefore, you know, a major one. Um. So, I mentioned that the Greeks figured out that once you got smallpox, you didn't get it again. Uh. The first indication that somebody kind of thought maybe we can do something with that is from Ancient China. Uh. There's this one story that's referenced from the 10th century.

Justin:
Mm-hmm.

Sydnee:
That the emperor lost his son to smallpox and he basically got together a big, like, council of doctors and wise men and magicians. I don't know. [laughs] Whoever. People that do card tricks.

Justin:
Right. The whole gamut.

Sydnee:
Yeah. People with the sawing ladies in half and the hoops. Probably not them.

Justin:
[laughs] No.

Sydnee:
I don't think they were involved. And they all tried to come up with ways to stop people from dying of smallpox. Now, the story goes that, at some point during the meeting, there was a really smart guy who came down from the top of a mountain and gave them all the idea of inoculation.

Justin:
Moses?

Sydnee:
Here's the problem with this story. It wasn't recorded until, like, centuries later.

Justin:
Okay.

Sydnee:
So it's probably not true.

Justin:
Okay.

Sydnee:
But we're still gonna credit the Chinese with the discovery of, um, inoculation.

Justin:
Somebody over there came up with it.

Sydnee:
At some point.

Justin:
Why they wouldn't take credit for it, why they want to give it to an old tablet man—

Sydnee:
I don't know [laughs]

Justin:
... I don't know.

Sydnee:
I don't know why there's this whole convoluted story about the council and—

Justin:
Maybe he did it.

Sydnee:
... magicians and the—

Justin:
Maybe he wasn't, like, 100% sure it was gonna work. "You know, I heard that, like, maybe, like, 100, maybe, like, 300 years ago there was, like, an old tablet guy and he went up and got tablets that had that on 'em so that's kind— maybe you should try that."

Sydnee:
You made up the tablet thing. For all we know, he wrote it on a piece of paper and, like, made a paper airplane—

Justin:
I'm juxtaposing.

Sydnee:
... and flew it into the middle of the council [laughs]

Justin:
I'm juxtaposing my biblical stories, I think. But yes. Okay. So somebody—

Sydnee:
Somebody in China.

Justin:
... went to the top of a mountain and came back with smallpox.

Sydnee:
[laughs] No.

Justin:
No? Okay.

Sydnee:
Came back with the idea. And, and it's first actually described in, like, 1643.

Justin:
Okay.

Sydnee:
How long before somebody knew this was a good idea, I don't know, but it was first described then. So the first actual description is of inoculation or variolation, which are words that are slightly different as you may notice—

Justin:
Yeah. I don't know variolation.

Sydnee:
So that comes from, I mentioned, um, variola major, variola minor, when we were talking about smallpox. That's where that term comes from, variolation. It comes from, um, specifically giving somebody a, you know, part of a smallpox lesion, a scab, some puss, and, like, putting it in their body somehow.

Justin:
On a cracker or something. Sneak it into them.

Sydnee:
Well, they were different ways.

Justin:
On a bologna sandwich you make without their knowledge.

Sydnee:
[laughs] Some of them were, were more unpleasant than a bologna sandwich, if you can imagine that.

Justin:
Seems unlikely. I really don't like bologna that much.

Sydnee:
Uh. You can also use inoculation to refer to this. Um. But variolation is what they called it at the time.

Justin:
Okay.

Sydnee:
Because they thought, okay, so some people get really bad smallpox and they can die, variola major. Some people get, um, kind of bad smallpox and they don't die for the most part, um, for the most part. So what if we take people who get a really mild infection, we [laughs] peel off some of their scabs—

Justin:

Okay.

Sydnee:
... and crush 'em up.

Justin:
Sounding suspiciously like a Garbage Pail Kids card so far, but go on.

Sydnee:
[laughs] We put them on some cotton, and we stick it up the nose of a person who isn't sick and let them breathe it in.

Justin:
Who is the guy who says yes? Who is the guy, the old guy in history, who's like, "Yeah. Get it in there."

Sydnee:
Just stick that right up my nose.

Justin:
I've managed to somehow avoid smallpox, now, in the 1600s. I think what I, uh, has anybody invented Q Tips you can just jam it right up in there? I'm, I'm down. I'm down for it. Let's go.

Sydnee:
[laughs] Well—

Justin:
Oh. Wait. I just remembered. I'm probably a slave.

Sydnee:
[laughs] Well—

Justin:
Probably. Almost certainly. Right?

Sydnee:
Almost certainly. Somebody who had no other power or no other choice was being forced to do this.

Justin:
I can't imagine you had willing volunteers for this.

Sydnee:
Um. You never know because one theme that we'll kind of hit on a few times is, uh, moms who had some position of, uh, of prestige or power who say, "I am tired of watching my kids die of smallpox. I will do anything to protect my kids who are still alive from getting it." Which is kind of cool.

And so, that's where you see some of the advances in, um, in vaccination as we move forward, are moms who just say, "Yeah. Fine. Try it. Let's do it. Let's do it. If it'll save my child from going the way of my other three children, I'll let it happen." Which is kind of cool.

Justin:
Hey, moms. Hey, moms that are at home and aren't gonna get vaccines for your kids because you read something on the internet, other moms gave themselves smallpox because they were so desperate for a cure for it. That's love. That's devotion. That's not acting out of fear. Every time that you deny your kids that vaccine, you are invalidating one of the most beautiful sacrifices I have ever heard of in my entire life. I'm probably going to try to keep these outbursts to a minimum but I'm begging you, please, use your noggin.

Sydnee:
Well, now, let me be clear. The moms were doing it not to themselves, but they were also doing it to their kids.

Justin:
Fine. Oh. That's not any different.

Sydnee:
Wait, uh, I just wanted to make sure you know but I agree.

Justin:
All the, all the better.

Sydnee:
I agree.

Justin:
Please.

Sydnee:

I agree.

Justin:
Please, moms.

Sydnee:
It was anything to save my kid was basically it. I'm watching all of my children and everybody else's children die of smallpox, what can I do to stop it?

Justin:
Okay. I'm sorry.

Sydnee:
So, um, they called it implanting the sprouts.

Justin:
Like John… [laughs] Like a crappy Johnny Epstein.

Sydnee:
I like, I kind of like that.

Justin:
[sings] Oh, the lord's been good to me…

Sydnee:
[laughs]

Justin:
[sings] So we got smallpox.

Sydnee:
So I'll take these scabs...

Justin:
[sings] I'm gonna give your scabs to him and her, and him and her, and him. Here, guys. Take these scabs.

Sydnee:
And, uh, people did get sick, you know, through this process. But the idea was that if they got— and they may get very mildly ill, or they may actually get variola minor, the, the minor form of smallpox. But a very small

percentage of those people actually died, and then you were still protected against either form of smallpox. So, in the long run, it was worth it was the though.

Justin:
Okay.

Sydnee:
Later, there was a method where you would take the scabs off somebody. Again, we're only talking about people who had minor infections. You would wrap them in cotton, you'd put 'em in a bottle and then carry it around with you until— for a while. And it had something to do with its yang potency and—

Justin:
Like in a locket?

Sydnee:
Well, you, I mean, no. Just in your pocket or whatever [laughs]

Justin:
[laughs] Film canister, whatever you had handy.

Sydnee:
Uh. And Altoids box. [laughs]

Justin:
[laughs]

Sydnee:
Um. And once it was all dried, you could, again, um, instead of just putting it on cotton and sticking it up your nose, you could also blow it up the nose of the person you were inoculating.

Justin:
Mm-hmm.

Sydnee:
So, like, shotgun that dried scab material right up your nose.

Justin:
Man, you have got to really, really not want smallpox. [laughs]

Sydnee:
[laughs] Um. And, uh, this was tried throughout different cultures in different ways. So, like I said, initially the idea was, let's take these dried scabs and let's, um, you know, basically stick 'em up your nose. Uh. In Turkey, it was described that you would take, uh, a pustule from the arm of an infected child, um, so, like, just cut off one of the— and I don't know if I made this clear, although most people probably already know this, smallpox causes a pretty distinctive rash.

Justin:
Mm-hmm.

Sydnee:
Um. If you look up some pictures, it's, it's wildly impressive, the terrible rash that you can get. Um. But it starts out, um, like as a flat, flat red spot and then it becomes a bump, and eventually it becomes a pustule which is when it looks all white and puss-filled.

Justin:
Mm-hmm.

Sydnee:
It's not filled with puss, it's just dead tissue. So don't worry. [laughs] But anyway, you can take—

Justin:
I'm like retroactively upset about a disease that I can't possibly get now.

Sydnee:
Yes. So—

Justin:
Thank you for that. Cool show.

Sydnee:
[laughs]

Justin:
Cool podcast.

Sydnee:

So you take one of these pustules—

Justin:
Are you sure you don't wanna go listen to Radiolab or something? All right. What are you doing here?

Sydnee:
[laughs] I'm so— I've got to tell you what you do with the pustule.

Justin:
Yeah. Go on. Please.

Sydnee:
So you take the pustule, you cut the arm of a healthy child, and you stick it in there. You know?

Justin:
Ugh.

Sydnee:
So this was another method that was practiced.

Justin:
You know 99% Invisible is good too. That's anoth— it's short, too. You can listen. It's about architecture.

Sydnee:
[laughs] Do they teach you about pustules?

Justin:
You almost never— almost never will throw up in your mouth while listening to 99% Invisible [laughs] That's a guarantee.

Sydnee:
The, the progression, I'll never forget this, of the smallpox rash, is macule to papule to vesicle to pustule. I remem— I memorized that in med school and I'll never forget it.

Justin:
[laughs] It sounds like a bad public service rap.

Sydnee:

[laughs] Macule to papule to vesicle to pustule. You know what, though? That's completely— I don't know why I need to know that. I'm, I mean, hopefully, knock on wood, never gonna see smallpox.

Justin:
Yeah. I, like, let's, like, wicked hope not because over the past, like, 15 minutes, I've been staving off a pretty wicked panic attack about the possibility of, like, people reintroducing smallpox into society.

Sydnee:
Hey. That's— we'll get to that.

Justin:
Oh. Good.

Sydnee:
Um. To that fear. Nobody's doing it but there's a fear.

Justin:
Wonderful. Fantastic.

Sydnee:
So this, this pustule, this, um, I guess, is this better than blowing it up your nose? I don't think so.

Justin:
Uh-uh.

Sydnee:
This was practice, similar methods were practiced in India, Ethiopia, West Africa, um, there were many different places were this, this concept of variolation, at this point. This is not vaccination yet. This is variolation. It's different. Because we're actually taking disease material from a sick person and sticking it in the body of a healthy person.

Justin:
Okay.

Sydnee:
Which is slightly different than what we're gonna talk about later.

Justin:

Okay.

Sydnee:
So, uh, for spreading the practice of variolation to the western world, we really have to credit, um, Lady Mary Wortley Montagu.

Justin:
Lady, what?

Sydnee:
[laughs]

Justin:
Let me try again.

Sydnee:
Mary.

Justin:
Lady Mary.

Sydnee:
Wortley.

Justin:
Wortley.

Sydnee:
Montagu.

Justin:
Montagu. Pleasure. Charmed, I'm sure.

Sydnee:
She was the wife of the, uh [laughs]—

Justin:
Did you travel far?

Sydnee:
... of the ambassador to Turkey. And, uh, she was also referred to as a famous letter writer.

Justin:
Okay. You were tripped out when you read that earlier. Did you find out what a letter writer does?

Sydnee:
I don't know that it's an official thing. I'm guessing that there's just a lot of letters we found that she wrote. I was, I was trying to figure out of that was a term for an old-fashioned transcriptionist.

Justin:
That's, like, the closest they had to, like, uh, editorials back then, right? You've seen lots of published letters.

Sydnee:
I mean, I guess.

Justin:
Mark Twain, I feel like wrote a bunch to people.

Sydnee:
Is he referred to as a famous letter writer?

Justin:
No. Because he did, like, the books and stuff.

Sydnee:
If anybody knows [laughs]—

Justin:
If you're a famous letter writer, write us a letter.

Sydnee:
... can you please, is that like a— was that a term that was used?

Justin:
Summon to maximumfun.org. We can't be experts in everything, people.

Sydnee:
I don't know. I, I found a movie that was called The Letter Writer but it was about, like, a little girl and—

Justin:
I know a movie called The Lake House.

Sydnee:
... letters and yeah. I mean, I don't know. Anyway. Uh. She saw these practices in Turkey.

Justin:
Okay.

Sydnee:
And then she brought them back, uh, with her and said, you know, to, to the UK, and said, I want to try this on my children because, again, everybody's getting sick and dying of smallpox. And she actually almost died herself of smallpox.

And so she said, "We've got to do something. We've got to save our kids." And, um, it was really hard for her to get a doctor to do it because a lot of—there was a lot of pressure at the time, uh, you know a lot of political pressure. A lot of the doctors wouldn't do it. They weren't familiar with it, it sounded gross.

Justin:
Fair.

Sydnee:
But she convinced somebody to do it and that was really important because when a woman of stature started having the practice done to her children and then they didn't get smallpox, everybody else started, you know, jumping on board. Now, of course, they tried it out first on some prisoners.

Justin:
Okay.

Sydnee:
Uh. By saying, "We won't hang you if you let us do this because either you go free or you die of smallpox." And they went free.

Justin:
There you go.

Sydnee:
So, I mean, it played— it paid off. You know.

Justin:
Like a trial by combat.

Sydnee:
Yeah.

Justin:
Sort of like a gross version of the trial by combat.

Sydnee:
[laughs] Um. Not something that we would approve today. Like, not a trial that would get IRB approval now, but—

Justin:
We do have a problem with prison overpopulation but I see what you're saying. That might be a little bit, just a touch on the unethical side.

Sydnee:
Yeah. I don't think that's the solution personally.

Justin:
I don't think either.

Sydnee:
Personally.

Justin:
It would be mandatory minimum [inaudible]… but—

Sydnee:
That's another show.

Justin:
That's another show.

Sydnee:
Uh. Not, not this show.

Justin:
Not this show. [laughs]

Sydnee:
Not a Sawbones show.

Justin:
[laughs]

Sydnee:
I'm sure that's a great show too, as long as you're expanding your horizons today.

Justin:
Yeah. Right.

Sydnee:
Um. Anyway, so this practice began to get popular. It spread, you know, throughout the western world somewhat. It was tried in the US, um, in Boston it became somewhat popular. But, again, there was a lot of controversy about it because it seems gross.

Justin:
It does. I mean—

Sydnee:
Can I scrape your scab and then scrape your arm?

Justin:
It does seem gross and that's where you have to have sympathy for people who are a little bit, like, squidgy about it. Right? Like, because it does seem kind of gross. I mean, the whole idea is kind of weird.

Sydnee:
It does. It seems kind of gross.

Justin:
This is actually what I think is so interesting about vaccines, when you talk at the initial, at the beginning of the show about how this isn't an idea that we got really wrong. You know, we got it right from the beginning and we refined it. I think it's because the initial idea is so weird.

Sydnee:
Right.

Justin:
The initial idea is so counter-intuitive that—

Sydnee:
I'm gonna put some kind of disease causing agent into my body.

Justin:
Right. It, it really does go against, uh, logic. Where so many of the treatments we've seen are, like, things that sort of make sense in a weird sort of way. Like, a lot of the stuff, especially with like temperature and, and, and that kind of thing. You know, like, put some heat on it, put some cold on it. Whatever. Like, they, they make sense in a, in a, in a sort of beleaguered, logical way. This is so weird that just, like, we got it right just from the weird, having that one weird idea was really the victory [laughs] for—

Sydnee:
Well, and that's really it because we didn't understand. I mean, now we know that this has to do with your body making antibodies to things, you know, when it meets some sort of invader and then it remembers it so when you meet that invader again, you, you know, those antibodies come out to defend you and we understand all that now.

Justin:
It's like the first time Mac and Me lands on Earth. You're not scared of Mac and Me. Like in the hit film Mac and Me.

Sydnee:
Mm-hmm.

Justin:
But, like, maybe we're a little terrified and then other Mac and Mes show up later and it's, like, not as scary. It's like if other ETs had come down after the first ET, we could kind of be like, uh, all right. We're kind of into it.

Sydnee:
I don't know if this is working as well as your Cliffs Notes example.

Justin:
Let's stick with the Cliffs Notes. Let's pretend I didn't bring this up.

Sydnee:
Okay. I mean, it was a good try. I see where you're going. I'm—

Justin:
In the Cliffs Notes of this podcast—

Sydnee:
[laughs]

Justin:
... this example will not be included.

Sydnee:
Um. So we would've continued probably on this road—

Justin:
Thanks for nothing, Brandy.

Sydnee:
... [laughs] if it were not for Edward Jenner, who was, um, most like to describe him as a, as a country doctor in Berkeley.

Justin:
Yeah.

Sydnee:
Uh. In the UK, in England. And he noticed and, um, he was very observant. He was very into the scientific method. Uh. And he noticed, uh, that a lot of people in his little country town told him that, "Hey, I'm not going to get smallpox, I don't have to worry about that," which was the big worry for everybody at the time, "because I got cowpox and once you get cowpox, you can't get smallpox." Now, cowpox is a pox virus that cows get. [laughs]

Justin:
[laughs]

Sydnee:

And that humans can get. There's a lot of— there's monkey pox. There's a lot of different poxes.

Justin:
Mm-hmm.

Sydnee:
So, uh, the most common people to get cowpox were milkmaids. They would get it from milking cows. Go figure.

Justin:
Mm-hmm.

Sydnee:
Um. And they would get some sores, some pox—like sores that were similar, but you didn't get nearly as ill, obviously, as you did from smallpox.

Justin:
Right.

Sydnee:
And they claimed that they weren't gonna get smallpox afterwards.

Justin:
Pox lite.

Sydnee:
Yes. So he was, he was intrigued. He was familiar with the idea of variolation because everybody was, um, and this seemed to kind of fit into that theory. And this— and I should note, this, this same idea about cowpox was being tossed around in other countries at the same time.

Justin:
So, just so I'm clear, cowpox was, uh, in the same, I mean, I'm not using the correct terminology here, but the same family.

Sydnee:
It's related to the smallpox—

Justin:
Related okay.

Sydnee:
... virus. Yeah.

Justin:
Close enough.

Sydnee:
In the pox virus—

Justin:
Okay.

Sydnee:
... compendium. [laughs] But, uh—

Justin:
It's like an ET with three eyes basically.

Sydnee:
We're back to the ET. You really want ET to work here, don't you?

Justin:
I couldn't think of a good, uh, good Cliffs Notes version of it, but—

Sydnee:
So, um—

Justin:
House of Six Gables. If you had the Cliffs Notes for House of Six Gables [laughs] it's like that.

Sydnee:
[laughs] Hated that book.

Justin:
It's a really bad book.

Sydnee:
Um. So, he, he thought, okay, what can I do with this information? How can I help people? So he took a milkmaid, Sarah Nelmes, I believe, was her name. And he, she had, she had had cowpox at the time.

Justin:
Mm-hmm.

Sydnee:
And he took some material, some puss material, from one of her cowpox sores and he kind of put it in the arm of an eight—year—old boy. You know, cut his arm and kind of stuck it in there.

Justin:
He offered him some candy...

Sydnee:
[laughs] It's not recorded if he paid him. Um. He was a very poor— I initially thought he was— I had, um, I had thought wrongly that he was an orphan. He wasn't. He was from a very poor family. So my guess would be that there was some sort of exchange of money. I don't know though. Uh.

But he asked James Fipps, this boy's father, can I inoculate him [laughs] with cowpox? And, for whatever reason, he said yes. And so he, you know, put some of the puss in his arm. He did get sick but, again, with a very minor form of cowpox as opposed to smallpox. After he got better, about six weeks later, he went ahead and gave him smallpox. He variolated him with smallpox.

Justin:
Mm-hmm.

Sydnee:
And—

Justin:
What, what happened?

Sydnee:
... he didn't get sick.

Justin:
Nice.

Sydnee:

So he tried it— I, I found it referenced sometimes that he tried it three or four more times, other places that he tried it 20—

Justin:
Just giving him every— giving that kid every kind of pox he could find.

Sydnee:
... 20 more times.

Justin:
Just 20— he gave that little kid, like, every kind of pox known to man?

Sydnee:
Somewhere between three and 20 times, he injected him with smallpox. And the point is that he didn't ever get it.

Justin:
Why won't you—

Sydnee:
Get smallpox, James Fipps.

Justin:
Please, sir. Don't make me get another injection [laughs] of smallpox.

Sydnee:
[laughs]

Justin:
I think we're all super clear that this has worked. You know, I'm convinced, sir. Honestly. [laughs] I've had eight shots of smallpox, you don't, you really, I'm cool. I feel great.

Sydnee:
[laughs] How do you settle on 20? I don't know?

Justin:
I think that's enough. I think, I think at this point, this boy, if he was going to get smallpox, he probably would. But that's just the little boy in a trench coat standing on one of his friend's shoulders pretending to be—

Sydnee:

[laughs]

Justin:
... another doctor. I wouldn't go giving him any more smallpox shots
[laughs]

Sydnee:
Maybe he needs some candy for what he's been through.

Justin:
Perhaps you should go to the store to get him some candy.

Sydnee:
A peppermint stick seems in order.

Justin:
A larder of calico, perhaps.

Sydnee:
A larder of calico?

Justin:
That's the only other old timey thing I know they had in general stores.

Sydnee:
I don't think that's—

Justin:
Sassafras candies. That'd be good.

Sydnee:
[laughs] Um. He—

Justin:
Horehound!

Sydnee:
Okay. So obviously this was unethical and would not be done today. Um.

Justin:

But it was important that it happened then. This is the great, this is the great double standard of [laughs] medicine. We're glad that it happened back then, but we, uh, we understand [laughs] that we can't do it again.

Sydnee:
[laughs] No. Don't do this. Don't try that at home. Don't inject any children with smallpox. So, even though this clearly was unethical, he proceeded to try it on many other, probably more poor people and their kids.

Justin:
Right.

Sydnee:
In the area. People who would allow it to, to happen again. I don't know if he gave them money. I would guess, yes. And—

Justin:
Let's, let's say yes.

Sydnee:
Let's say yes.

Justin:
I'll sleep a little better.

Sydnee:
He did, I know that later on in life, he gave Fipps and his family a free lease on a house. Because Jenner got really famous from this whole deal.

Justin:
All right.

Sydnee:
So that's some— I mean, he gave him— he tried to give smallpox, so eh.

Justin:
Yeah. It's the least he could do.

Sydnee:
But, um, but he published this work in 1798. So he, he wasn't the first one to think of this, but he was the first one to publish it. Um. And that is when

we started doing vaccination instead of variolation, or you can still say inoculation if you want. But vaccination.

Justin:
Okay.

Sydnee:
And that's the most proper terminology now, vaccination. Or immunization is probably even better because vaccination comes from vacca for cow.

Justin:
Oh.

Sydnee:
Cowpox.

Justin:
Oh. Okay.

Sydnee:
So initially vaccination only referred to, you know, giving somebody cowpox, but nowadays—

Justin:
Hold on a sec. So even though it's not linguistically the most accurate, it is clinically what is used.

Sydnee:
Yeah. It's been accepted. Um. Really, the best term you could use, if you want to be exact, say immunization.

Justin:
Okay.

Sydnee:
And that would refer to any of them.

Justin:
All right.

Sydnee:

So, um, some drawbacks, and there were still some people that were a little nervous about this because, uh, you're still transferring material from one person to another. So if that person has other diseases, you could give them that disease as well.

So, for instance, there were a handful of times where syphilis was passed from one person to another. You can imagine that this really upset some people. Especially if you were vaccinating a child. This rarely happened but it was much, um, much complained about. A book was written about it even though it was a very rare complication.

Justin:
Hmm.

Sydnee:
Plus all the variolation people were pretty pissed off because they're still doing this and they're making a lot of money doing it, and now all of a sudden there's this better method. So they started arguing that, well, it uses animal material initially and that's gross so don't do that.

Justin:
Hmm.

Sydnee:
Of course, none of that was really relevant.

Justin:
Right.

Sydnee:
Because vaccination was a better idea. And so it spread all over Europe, into the US. You know how Spain, um, actually sent it to the Americas to its colonies in the Caribbean, um, by sending a ship with five orphans who all had been, uh, inoculated— or, um, I'm sorry, who had been vaccinated, um, on their arm, with [laughs] cowpox so that they would all have, uh, you know, scabs. They would all— and they would keep it fresh all the way across the ocean, and so they would have some material to draw from when they got to the colonies.

Justin:
And that was the original idea for Power Rangers. That is how they got started.

Sydnee:
[laughs] It was like, I just think, I mean, that's terrible, obviously.

Justin:
They were the original Teen Titans.

Sydnee:
They were vaccinated. They were now safe from smallpox, and they did bring the vaccine. Of course, that hadn't stopped us from spreading it to all the Native Americans, and the Native people in the Caribbean.

Justin:
Terrible, sure. But heroic.

Sydnee:
Um.

Justin:
Heroic kids.

Sydnee:
Later on, just for completeness, we later replaced cowpox with another virus called vaccinia, which you can probably guess why it was named that. But that really doesn't matter and we don't need to get into why.

Justin:
Okay.

Sydnee:
The point is that, uh, the vaccination program at this point, um, begins spreading all over the world and it was greatly decreasing the incidence of smallpox which was a big deal because, as I mentioned, lots of people were dying of smallpox.

Justin:
A lot.

Sydnee:
Um. This worked so fast that, by the late 1800s, we were seeing the end of smallpox in the US. Um. In the 1900s, it started disappearing from different countries in Europe one by one. Um. And then, finally, in the 1950s, we're

all the way up to now, the World Health Organization said, you know what? If we worked at this, we could probably get rid of smallpox.

Justin:
Let's do it.

Sydnee:
As a world, let's get rid of smallpox.

Justin:
We've earned it.

Sydnee:
And so, because, at that point, two million people were still dying every year of smallpox. And so we did. We got rid— uh, which, I just can't imagine the whole world working together.

Justin:
To get rid of this one thing.

Sydnee:
Yeah. Uh. In 1977, the last naturally occurring case of smallpox occurred. It was in Somalia. Since then, we've had no—

Justin:
And, boy, did that dude have an awkward life. You know, uh, the last, uh, I mean, you do what you think, you do what you think is best. It's completely up to you, but you are the last person with smallpox. Whatever you think, though.

Sydnee:
They lived. They did survive. Um. There— now, this was the, like I said, this was the last naturally occurring case. At this point, we had eradicated it through vaccination. We don't have a treatment or a cure here. This is purely through vaccination. We've eradicated smallpox. Um. But a lot of people still have samples of it. Right? And so, in 1978, there was a medical photographer who accidentally infected themselves and actually died from smallpox.

Justin:
[laughs]

Sydnee:
Um. So as a result of that incident—

Justin:
What was he getting a picture of?

Sydnee:
Smallpox.

Justin:
All right.

Sydnee:
I don't know. He was trying to take a picture of the virus, I guess.

Justin:
Okay.

Sydnee:
I, I didn't get that far into it [laughs]

Justin:
[laughs] Okay.

Sydnee:
But, um, at that point, it was decided that we should destroy all stores of the virus except for, um, one was kept in the US at the CDC. And then one was kept at what was then the USSR at Vector, their laboratory. Um. Of course, now it's in Russia. And then there's still a lot of controversy and, you know, suspicion.

Did it get spread to other countries when the Soviet Union dissolved? Do other people have it? That's why, briefly, um, some of our military personnel started becoming, uh, immunized against it again. Um. After 2001. So, um, I believe that's still going on, actually, with some of our military personnel. But, for the most part, none of us, um, have been vaccinated now. So we are a naïve population.

Justin:
Yeah.

Sydnee:
But that is because we eradicated smallpox through vaccines and, from then, you know, from the smallpox vaccine, we just went crazy. Vaccines for rabies, polio, DTaP, MMR, you know, all different kinds of vaccines. Um. As I mentioned—

Justin:
HPV is crazy because that's, like, been in our lifetime.

Sydnee:
Yeah. The Gardasil, the human papillomavirus vaccine.

Justin:
It's wild.

Sydnee:
Um. The first vaccine to prevent cancer. So that's pretty cool.

Justin:
If you like that sort of thing [laughs]

Sydnee:
As vaccines [laughs] have become more prevalent throughout the common era, many people have objected. Some were on religious grounds, the basis being that God punishes us with disease and so it is sinful to prevent it.

Justin:
God also blessed us with free will and the minds to come up with vaccines, so make of that what you will.

Sydnee:
Um. From the widespread use of vaccines, there began to, uh, many of us are familiar with, uh, become laws enforcing vaccination. And, as you know, a lot of— and now you don't have to get vaccinated but your children may not be able to attend public school, depending on where you are, if they don't get vaccinated. Um. And this was challenged all the way back with the smallpox vaccine in Massachusetts, um, way back in the 1800s, and it was upheld by the court that you can force people to get vaccinated all you want because of herd immunity.

Justin:

Right.

Sydnee:
We rely on— and what that just means is we rely on everybody getting vaccinated to protect us.

Justin:
Herd immunity is interesting because it's an argument that— it's an idea that both sides use to support their own cause. Right? I don't need to get my kid vaccinated because of herd immunity.

Sydnee:
Right. Because everybody else's kids are vaccinated. But the fact is how many people can keep saying they don't want to get vaccinated until we lose herd immunity? And that number's different for every disease and every immunization and obviously we've exceeded that in places like California where we had a measles outbreak.

Justin:
Cool job, California. You dullards.

Sydnee:
They're not the only state. There are other state— there are other places where this is happening too.

Justin:
Give me names.

Sydnee:
[laughs]

Justin:
I want to put every state on blast.

Sydnee:
New York is having this problem too.

Justin:
New York.

Sydnee:

Um. And there are lots of other places where people feel like either their civil liberties are being violated if they're being forced to get— if they're being forced to be vaccinated. Um. And there's also a lot of bad science and that's, uh, the basis of a lot of people's arguments. In the— this started back in 1982.

There was a movie called DPT: Vaccine Roulette which was about the diphtheria pertussis tetanus vaccine and it was based on some horror stories of vaccine side effects that were largely untrue and, and totally blown out of proportion. And it terrified a lot of parents about this vaccine, um, based on total misinformation. Um. Similarly, and I think most of us are familiar with Andrew Wakefield, who was the former surgeon, um, in Britain, who published two papers, one in '98, one in 2002, that linked the measles, mumps, rubella vaccine with autism.

Justin:
Man, that guy is lucky we do a cursory show.

Sydnee:
It was, um, again, we talk about bad science. It was a bad study. The results, uh, were falsified and misreported and it's totally been refuted. And there are— I, I can't tell you how many thousands and thousands of, uh, children have been in, you know, other studies that have proven this is not true. This link is not true. Period. End of that sentence.

Justin:
So, please, get vaccinated. It's not— the— if you were coming here thinking this would be a balanced show, there is no balance. There aren't two sides.

Sydnee:
What's that thing, what's that thing in journalism, Justin? You know about that. When there's not really two sides to a story.

Justin:
Uh. That's something The Newsroom invented but—

Sydnee:
Oh.

Justin:
... I think it's valid here.

Sydnee:

[laughs]

Justin:
There aren't two sides to this. There's no secret being covered up. It's not, uh, it's just people making up dumb things because they want to create fear in you. Please, just get your kids vaccinated. Send this episode to your disbelieving friends. Let them hear, like, the incredible struggles we had to go through to get to this point before they callously make a decision about what they're gonna do for their child's future based on something they read on the internet.

Sydnee:
And your child's future, and my child's future, and everybody else's child's future.

Justin:
Right.

Sydnee:
Because some people can't get vaccinated for a variety of health reasons and they depend on those of us who can to protect them from all of these totally preventable diseases. It's insane that we have people dying of measles in 2014, in this country, when, um, again, it's totally preventable. But one of the biggest reasons this is problem is that people are too comfortable now.

Justin:
Mm-hmm.

Sydnee:
Um. And I think that's why it's important to know this kind of history and to remember this, that the only reason, you know, and I think measles and whooping cough demonstrate this, that people aren't still, children aren't still dying of these diseases in droves, is the invention of vaccines. I mean, that is why. It's not because they're eradicated.

Yes. We eradicated smallpox. Go us. We didn't eradicated polio, we didn't eradicate measles, we didn't eradicate, you know, all of these other things that we have vaccines for. Um. And the other thing people like to say is that, uh, we're trying to make money off of vaccines. That that's why I wanna vaccinate your children, is because I make all this money off of it.

Well, first of all, as a physician, that's ludicrous. But secondly, um, vaccine, or manufacturers, pharmaceutical companies, actually that's not a very lucrative business for them. They could make a lot more money on a lot of other drugs and that was part of why we had a shortage of flu vaccine back in 2004, is because it's so cumbersome to go through the process of making the flu vaccine with all the regulations that a lot of companies just didn't want to do it. So it's not that lucrative for us. The reason to get vaccinated is not so somebody makes money, it's because it's going to save your child and everybody else's child's lives.

Justin:
If you don't think things are a good idea and they aren't making someone right, those are the goodest good ideas we have. Those are the ones you can take the most heart in being accurate.

Sydnee:
If you have questions, of course, like we always say, ask your doctor. Um. There's all kind of information that the CDC, uh, regulates that we have to put out, that we have to give you about vaccines. So ask your doctor. There's a ton of misinformation on the internet. There's a lot of crap out there that will scare you. Um. So ask somebody who knows, because the medical community is united in this position. Um.

Justin:
It's not up for debate. Please. Please, please, please. This is, this is, there are so few clear wins in life. This is one of them. Just get your kids vaccinated.

Sydnee:
Yeah. And if you're concerned that your, your child does fall into that group that can't get vaccinated, just ask your doctor. Your doctor will tell you and then there are maybe certain children and certain vaccines they can't get. But, again, as long as you have an open dialogue with your physician, this won't be a problem. Don't ask the internet.

Justin:
And I know what you think, is the government putting a microchip in there to control my kid? Maybe. Maybe one or two. I don't know. It's hard to say for sure. But I think it's worth it.

Sydnee:
And the answer is no.

Justin:
The answer is no. Is it? Hmm. I don't know. It's one to think about.

Sydnee:
Now we're go back to talking about, I don't know, drinking cholera diarrhea and eating mummies next week. But [laughs]—

Justin:
This is a really important episode for us and, you know what? Honestly, even if everybody listening to this episode does not have their minds changed, uh, or does not, you know, pass this along to somebody they know who's hesitant, at least I can sleep with a clear conscience [laughs] knowing that we did our, our small part.

Sydnee:
And, again, if you don't believe us, which we tell you not to believe us or listen to anything we say in our disclaimer so that's fair [laughs] Um. Ask your doctor, go to the CDC website, CDC.gov, and they can tell you all about these vaccines and exactly what they're thinking and why they do what they do.

Justin:
Uh.

Sydnee:
So, so, you know, trust science every time.

Justin:
Yep. Science won't lead you astray except for, just want to make it clear, the thousands of years before now.

Sydnee:
[laughs]

Justin:
As we've pointed out many, many times in our conversation.

Sydnee:
Our show is actually all about that. [laughs]

Justin:

That. But, no. Like, now they're cool. [laughs]

Sydnee:
But now—

Justin:
[laughs] Trust 'em.

Sydnee:
... remember the story of smallpox. Tell it to your children. It's a great bedtime story.

Justin:
It's the one thing medicine got right. Anyway, uh, that's gonna do it for us here on Sawbones. We hope you've had, uh, a fun, even though this was kind of a, uh, a serious, uh, episode. Thank you so much to Maximum Fun for having us on their network. Uh. They've got a lot of great shows there at maximumfun.org including Jordan, Jesse, Go!, Judge John Hodgman, Wham Bam Pow, Stop Podcasting Yourself, Bullseye, uh, One Bad Mother, Lady to Lady, Oh No, Ross and Carrie!, The Goosedown.

Sydnee:
My brother, My Brother, and Me.

Justin:
Thank you, dear. So many others. Uh. So go over there and check those out. You can email us sawbones@maximumfun.org. We've got t-shirts, maxfunstore.com. Uh. You can tweet at us @sawbones, uh, just like so many of your, uh, closest friends have done including Jalori, Tyreece Scepter, or, sorry, Tyreece Scheckter, uh, Miss Ada, Marnie, Laura Giddy, Ashley, uh, Freyja Gerke, Hannah Eli, Diesel Von Trot, Michael Krits, Lauren, Daniel, Lorraine, Ariel, Michelle, Greg, Laird, uh, Joshua, Lucas, Doug Piker, Kira Herbert, so many others. Thank you so much.

That's @sawbones, uh, if you want to, uh, tweet at us or, uh, tweet about us. Uh. You can also, if you want to spread the link to the show, it's sawbonesshow.com is, is the one that will, uh, uh, will lead you to our, our webpage at maximumfun.org. Thank you to The Taxpayers for letting us use their song Medicines, uh, on, uh our program for intro and outro. And, I think that's gonna do it. It's good.

Go listen to all those Max Fun shows and make sure to join us again next Tuesday for another episode of Sawbones. Until then, I'm Justin McElroy.

Sydnee:
I'm Sydnee McElroy.

Justin:
As always, don't drill a hole in your head.

[theme music plays]

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