

Sawbones 587: Cyclospora

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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! Welcome to *Sawbones*, a marital tour of misguided medicine. I'm your cohost, Justin McElroy.

Sydnee: And I'm Sydnee McElroy.

Justin: Had a little—

Sydnee: You did point at me when you said Justin McElroy.

Justin: Justin McElroy.

Sydnee: No.

Justin: Y'all, I'm having— We went to— You know what it is?

Sydnee: [chuckles]

Justin: You know what it is, don't you?

Sydnee: Is it the lodge effect?

Justin: No, we went to New Orleans.

Sydnee: Oh. [laughs]

Justin: We went to New Orleans, and when you go to New Orleans, the slow gets deep down in your bones.

Sydnee: [laughs]

Justin: Sorry, that's us actually quoting...

Sydnee: An *SNL* sketch.

Justin: ... an *SNL* sketch *about* New Orleans.

Sydnee: About New Orleans.

Justin: Which we quote so many times that we ended up going [through laughter] to New Orleans for our 20th anniversary.

Sydnee: And then desperately trying not to be the people from the *SNL* sketch, yeah.

Justin: But we couldn't help it. It was a lovely time, but you're right. I've been thrown so far off my game, Syd. I'm just full of jambalaya and bayou air, and it has slowed my podcasting instincts. I've been thickened with beignets to a point where I have become unwieldy as a professional broadcaster. Sad. In my prime, too. That's the sad part. [laughs]

Sydnee: Well, I'm here to rescue you.

Justin: How?

Sydnee: With some exciting current medical news.

Justin: The food is going wild lately, with the things you can and cannot eat.

Sydnee: Yeah, that's— So we had a lot of people reach out, and I was already— I have to be honest. I didn't thank you all, because I was already

working on the episode. As soon as I heard about the explosive diarrhea parasite, Cyclospora. Which I will say, I learned about Cyclospora in medical school, of course. And then I also – I don't know if I've mentioned this on the show before – I also did a track in my residency for global health.

Justin: Mm-hmm.

Sydnee: And as part of that— You're looking at me like, "Oh, tell me more." You know about this. You were there with me.

Justin: Yeah. Part of the thing, when you're a cohost, is you try to look like an engaged listener, because the person you're talking to only has sort of you to talk to. So even though many things you tell me are familiar to me, as we have been married for quite some time...

Sydnee: Okay. Ooh, so this is a performance. This is acting.

Justin: It's not a performance. It's a facet.

Sydnee: [laughs] Anyway, as part of this track that I went on, I was able to travel overseas. I think I've talked about that practicing abroad, but I also took a course on tropical diseases and learned more than your average, I think, family doc about things like Cyclospora, about parasites that don't necessarily affect people in the US all the time.

Justin: Hmm.

Sydnee: It was a really great class. It was through the military. I'm not in the military, but I was able to take it, and...

Justin: I noticed that you billed it as "The explosive diarrhea parasite, Cyclospora." And it's very rare that we have one where they front-load the bad part, and *then* the name. It's like, you never get "The amazing Spider-Man." It's just Spider-Man. But this is one where they're hyping you up, like, [as a wrestling announcer] "Here it is! You've heard about it! The explosive diarrhea parasite, Cyclospora!"

Sydnee: Well, okay. What I was gonna say is, in none of the courses that I took, whether they were in regular medical school or in this specialized track, did anybody refer to it, in my memory, as “the explosive diarrhea parasite.” But now, it is— I think in the popular media, this is how we’re talking about it.

Justin: Mm-hmm.

Sydnee: Which is interesting, ‘cause it’s just diarrhea, guys. I mean, I guess any diarrhea can be explosive. [laughs] I don’t characterize— I don’t ask patients, “But is the diarrhea explosive?” It’s a weird thing. Is it watery, is it mucousy, is it bloody? These are things I need to know. But I don’t normally say, “But is it explosive?”

Justin: I mean, yes, but that’s classic doctor privilege. Because the most important [chuckles] thing I think, as a sufferer, is how long you have to react. [laughs] You know what I mean? Reaction time *is* massive. That is definitely a symptom. That’s a key component.

Sydnee: [laughs] Okay. We’re going to talk about Cyclospora, or Cyclosporiasis, which is when you have been infected with the parasite, and now you have the diarrhea. And—

Justin: [laughs]

Sydnee: [laughs] And we’re—

Justin: [chanting] Now you have the parasite, now you have the diarrhea.

Sydnee: [laughs] I don’t want you to stress. It is— Is it a big deal? Of course. Any—

Justin: [wheeze-laughs]

Sydnee: Any illness, you know, any outbreak, anything that we could limit exposure to—

Justin: Don't stress.

Sydnee: Don't stress. We should take—

Justin: Is it a problem?

Sydnee: We should take it seriously.

Justin: Sure.

Sydnee: Act intentionally. And—

Justin: Freak out a *little*.

Sydnee: No, don't freak out. Don't freak out. As we're recording this, I was sitting down to record this episode, and I was double checking newest updates. Because this is an evolving story. So there's literally news from nine hours ago that I had to include right now, so this will probably— We are recording this on Monday, July 20th.

Justin: Yeah.

Sydnee: So things might change after this, but this is what we know now.

Justin: We used to be able to talk about history [laughs] on this show. We didn't used to need date lines.

Sydnee: Well, I mean, when you defund major health organizations that are supposed to monitor these sorts of things, and prevent foodborne illness outbreaks...

Justin: Careful, Syd. We're going to lose another long-time *Sawbones* listener due to getting too political. [laughs] Every few weeks, we still get one. "Hey, I've listened for 14 years, and this show has gotten too political for me!" It's like, brother, [through laughter] what show did you listen to?

Sorry, go ahead.

Sydnee: Well, I mean, I don't know if I should just say— Healthcare is political. It just is.

Justin: Yeah.

Sydnee: *I* didn't make it that way. I just want to take care of people. But my government made it that way, so it is political. It's a human right. There. Anyway, let's talk about Cyclospora.

Justin: Yeah!

Sydnee: Let's not get too political, [laughs] Justin.

Justin: Yeah, Sydnee! I'd hate to have to quit listening to *Sawbones*.

Sydnee: So Cyclospora, in the— First of all, it's a parasite. I think parasites are interesting. Do you know— Okay. Most of the infections that you think of, that you come in contact with in your life, especially in the US, would be a bacteria or a virus.

Justin: Mm-hmm.

Sydnee: And we talk about those a lot on the show, and the differences, and how we treat them, and all those kinds of things. Cyclospora is a parasite, which certainly we see in the US, but I would say less frequently. And parasites are interesting, 'cause they're actually more closely related to animals than to bacteria. Isn't that wild to think about?

Justin: It is wild.

Sydnee: Yes. They are also eukaryotes, meaning their cells are more complex. They have organelles, they have nuclei. So it's a more complex organism than a bacteria, which makes them more challenging in a number of ways. They're more challenging to diagnose, because they have a life

cycle, and you have to catch them at certain— You have to know what to look for at different times in their life cycle. And they can be harder to treat for that reason. Not necessarily in this case, but in other cases, sometimes they're harder to treat.

Justin: In so much as this is a spectrum, would you say that viruses, viri?

Sydnee: Viruses.

Justin: Viruses are at the very end of that, because they're basically half machine anyway, right? Half dead, anyway.

Sydnee: I think that's probably a fair thing to say. Viruses are kind of over here, the undead of the microbiological world, or the infectious disease world.

Justin: It's like the dead, killing the dead. [laughs]

Sydnee: [laughs] They're their own thing, and they're unique. Bacteria are obviously living organisms; we know that. We can define bacteria that way. And then parasites. We're moving closer to animals at that point, and to humans. You know. 'Cause then you start thinking about worms and things, which they're really small, parasitic worms are very small, but you identify them when you look at them, it's like, "Oh, that looks like a worm. I know what a worm looks like." So you're starting to get towards the animal kingdom.

Justin: Yeah. I gotcha, yeah.

Sydnee: Does that make sense?

Justin: Yeah!

Sydnee: Okay.

Justin: And then the top of it, the chain, Cyrus "The Virus" from *Con Air*, of course, is the apex.

Sydnee: [laughs]

Justin: You go all the way up to Cyrus "The Virus."

Sydnee: So we knew about this genus, *Cyclospora*, back in probably— Well, a while ago. Before the '70s, but we didn't know it existed in humans until the '70s. There's a lot of different *Cyclospora* parasites for different kinds of animals. There's some in reptiles, there's some in birds, and obviously there are some in humans. They're unique to what they infect, which is important. The *Cyclospora* that we get is a human's— Like, it's going to infect humans.

Justin: Okay.

Sydnee: It's not existing in other animals. There are other *Cyclospora* for those animals to get, and I guess also have their own explosive diarrhea.

Justin: Yeah! Probably cuter.

Sydnee: [laughs] But we get this one. We first started to see human cases that we were able to like, "Okay. There is a new something, there's a new organism, and it's causing diarrhea," back in the late '70s in Papua New Guinea. They found some sort of new organism that they knew was a parasite, but they didn't know what it was, in three people with diarrhea.

But at the time, we were still sort of building the parasite world. You know, the whole taxonomy of how we categorize different forms of life is really interesting, in it evolves. Because every time we add something new to the catalog, we start to redefine, "What does that..."

Justin: Sure. 'Cause it's all in relation to [crosstalk].

Sydnee: Yes, exactly. Exactly. It's all made in relation to— So the more

information you put in there, it might change over time. And we see that, because initially, we think it's something that we already sort of understand, and we called it an Isospora. Which I think at the end of the day, probably to most of you listening, like, "I don't really care what we used to call it, why is it causing diarrhea?"

But it's an interesting evolution of, well, it looks much like this, and then we saw another outbreak in the '80s. There were some travelers to Haiti and Mexico that had a diarrhea illness, and they started to describe something in them that looked more like *Cryptosporidium*, and like, ooh, maybe it's some kind of blue-green algae. We're not sure. And it really wasn't until 1994 that we see, "Okay. This is a new organism. It is a *Cyclospora*. We know it's in the genus that we recognize already. But it's its own thing, and it is the *Cyclospora cayetanensis*. And that is the *Cyclospora* that we are talking about right now.

Justin: *Cyclospora cayetanensis*.

Sydnee: *Cayetanensis*.

Justin: *Cayetanensis*.

Sydnee: So that is the— It's from the university where they named it in Peru.

Justin: Ah. Gotcha.

Sydnee: Anyway, so— But I think if you talk about some of the other infections, I mean, if you think about the history of bacterial infections and stuff that we talk about on the show, they've been around for so— I mean, you think about the history of syphilis and how long we've known it was a thing, and we didn't really define this as its own organism until 1994. That feels so new.

Justin: Recent, yeah.

Sydnee: Yeah. Now, part of it, again, is because it is a parasite. And

parasites are, like I said, because they're more complex, they can be more difficult to diagnose. So Cyclospora specifically is a— It's a fecal-oral parasite. You know that's my favorite kind.

Justin: Your favorite route.

Sydnee: Mm-hmm. Which means that you get infected...

Justin: By poop in your mouth. You get some poop in your mouth.

Sydnee: Well, I mean, you didn't—

Justin: Little bit of poop in your booth.

Sydnee: I mean, it's not—

Justin: *Little tiny* bit of poop.

Sydnee: You didn't know the poop was there, probably. Hopefully.

Justin: It's a little tiny bit of poop, so small you can't see it. And you eat it, and it makes you sick. [laughs]

Sydnee: [laughs]

Justin: That's Sydnee's favorite route.

Sydnee: So the thing is, there's a life cycle to Cyclospora. I have a— Where's my picture? There it is. And you've got— [laughs] You have these little oocytes. They're just eight to ten micrometers, so they're tiny, tiny little round things, okay?

Justin: You guys dropped the ball with oocytes, by the way. I've been meaning to tell you. [laughs] That's no good.

Sydnee: They start off unsporulated. And so this is an important piece of

the life cycle. When you first poop them out, these things that are in your feces, they cannot infect anyone.

Justin: Okay.

Sydnee: They have not matured to a point of infectious capability.

Justin: Hmm!

Sydnee: They have to sit in the ground for a while.

Justin: Hmm.

Sydnee: And grow, and change.

Justin: Develop some character.

Sydnee: And mature, yes. And then they separate. And you can see, there's a circle with a blob inside, and then there's a circle with two distinct blobs inside. It has divided into these two infectious—

Justin: Is that mitosis, or meiosis?

Sydnee: It's mito— No. It's neither. It's sporulation.

Justin: Oh, gotcha.

Sydnee: Yes. It's its own thing. So they have sporulated, and now they are infectious. So what can happen is, once you have that material on the ground— And this is really important. The reason I'm trying to outline this is that it's not going from human to human. It can't.

Justin: Going from human poop, to dirt, [laughs] to—

Sydnee: Right. What comes out of you, if you are an infected human— Which that's where it is. It only lives in humans, so there are humans

carrying it around. It's endemic to certain parts of the world. A lot of our focus with this current outbreak has been in Central America, and then also now in Mexico, it looks like, maybe.

Justin: I just don't want this to have a chilling effect on the eating of other people's fecal matter intentionally.

Sydnee: [laughs]

Justin: If that's something that you enjoy, want to pursue, don't worry about Cyclospora.

Sydnee: Don't. No, don't do that. Don't do that. Don't do that.

Justin: Okay.

Sydnee: That's my advice. That's medical advice.

Justin: [sing-song] But to each his own!

Sydnee: I'm not trying to— No, no. This is not a judgment. Just medical advice, don't do that. Yeah. I mean, we said the same thing about drinking pee. Don't drink pee. My medical advice is don't drink pee.

Justin: We take a pretty hard line around here, for some [crosstalk].

Sydnee: Yeah. They're just— Don't. Anyway, so— [chuckles]

Justin: Now we're getting political again. [laughs]

Sydnee: [through laughter] Is that political?

Justin: That's way too political.

Sydnee: But again, I'm just trying to outline, it's not a human-to-human thing. I think that, in the wake of COVID, when you see outbreak of a new

illness, being really clear about what is contagious and how things are passed is *really* important, right?

Justin: Yeah.

Sydnee: Because otherwise, we create this undue panic when it's like, "Oh, my gosh. You had diarrhea. Am I gonna get diarrhea, now, because you had the parasite, and do I have the parasite?" You know. And no.

Justin: And if you see a big patch of explosive diarrhea out there, I want you to avoid it. Give it a wide berth.

Sydnee: [laughs]

Justin: For the *normal* reasons that you would avoid a huge pile of explosive diarrhea. Not 'cause you're worried about Cyclospora; just for the regular reasons. Your shoes, or whatever.

Sydnee: Now, what will happen is that once these now-sporulated parasites have matured, and they're out there in the water, in the soil, whatever, they can contaminate food. And this is what we're worried about, right? They can contaminate water, and they can contaminate food, specifically crops that might then be packaged and sent somewhere else in the world. And so you wouldn't necessarily be expecting Cyclospora where this product might end up, and it's not endemic.

And the thing is, when you have something in an area that is endemic, you have an illness that people catch over and over and over again, they tend to build up some sort of immunity to it, right? So you hope that future cases in the same human body will be less severe, because your body is more accustomed to it. When you take that same organism and introduce it into a naive population that doesn't typically become exposed to it, you can get more severe illness en masse. So lots of people getting sicker, all at the same time. Which again, still might not mean that it's fatal, but it can put stress on a healthcare system, right?

Justin: Yeah.

Sydnee: All of a sudden, if you have a small community where everybody eats a lettuce and gets sick, and then you've got 30 people with explosive diarrhea who all need IV fluids...

Justin: "Hey, who here ate a lettuce? Raise your hand if you ate a lettuce. God, all of you? All 30 of you ate a lettuce? What's *wrong* with you?"

Sydnee: Also, also, I will say, you really need a very tiny amount of the parasite to become infected. That's one thing about this, is there are different—

Justin: That's why you gotta be careful with lettuce, folks. [laughs] You may think one slice on your burger is okay, but I've been banging this drum for a long time. You gotta be careful.

Sydnee: No, it can be a very tiny amount. We kind of talk about that, with viruses, we talked a lot about the spread. Remember that? How many people would the average person be expected to infect? With parasites, what we're talking about is the infectious dose. How much of this parasite can you eat safely? Like, none is the answer, but how much realistically. It does not take very much for you to be infected. And the incubation period can be anywhere from one to 11 days, meaning that it can be hard to figure out what made you sick. Because it could be almost two weeks ago, right?

So now it's in your body. What is it going to do to you, and what do we need to do about it, and what do you need to know about the outbreak right now? I'm gonna tell you after the Billing Department.

Justin: Oh! Well, let's go.

[theme music plays]

[ad break]

Justin: Alright, Syd, catch me up. How are things going with Cyclospora?

Sydnee: Okay. So it's gotten into your body.

Justin: Oh, no!

Sydnee: You ingested— So probably some contaminated water or food source. You probably didn't know, right? I mean, hopefully you didn't know. And now it's been some number of days, and you're gonna start to get the usual symptoms of what we would call a gastroenteritis, meaning that your stomach and intestinal tract are inflamed.

Justin: [crosstalk]. Yeah, yeah.

Sydnee: Infected, inflamed, irritated. Something is in there, causing problems with the function of your intestines, and you are getting cramps, nausea. You've lost your appetite, you feel tired. You might get a low-grade fever, it's possible. And then of course, the diarrhea. Watery diarrhea, multiple bouts of watery diarrhea that can be— And when we say explosive, I think all they're trying to highlight is that it can hit ya out of nowhere. All of a sudden, you get that intestinal peristalsis, meaning it's squeezing, it's doing the wave, squeezing stuff down, squeezing stuff down, all at once. Like, bam, "I gotta go, I gotta go," right away.

Justin: Yeah.

Sydnee: Generally, the infection, how severe, it depends on the host. So if you are someone who doesn't have any underlying chronic illness, if you generally are in good health, if you're not very young and not very old, kind of in the middle of the age spectrum, you're not on other medications, you were well before this, you're probably not gonna get very severe disease. If you are on either end of the age spectrum, or if you are immunocompromised in some way, or have some underlying chronic illness, you could get much sicker. You know, that's true for a lot of things.

And the main thing is your body's ability to withstand diarrhea. Diarrhea, I know we're joking about it here, but diarrhea is a big deal across the globe. We take for granted, a lot of us—

Justin: Don't do that to me. Don't do that to me. Don't try to make me the bad guy, because I think diarrhea's funny. Don't you dare.

Sydnee: [chuckles]

Justin: Don't you dare.

Sydnee: Okay. I think—

Justin: Don't you shame me.

Sydnee: I think everything can be funny in context, right? I would— Listen, I work in medicine. There's a lot of dark humor in medicine. So there is a context in which lots of things can be funny. Diarrhea can be funny.

Justin: No, but you're right. It's super serious, because hydration becomes a huge problem very quickly, especially in resource-limited settings.

Sydnee: You're exactly right. That's the reason that illnesses like Cyclospora, these diarrheal illnesses, are such a big deal, is that in the US— I mean, I know right now that if I become infected with this parasite— I don't think I am. But we live in West Virginia, and we are one of the states impacted. We have cases in the state, so that's possible.

So if I got this illness, I know, one, that I could go to the hospital – or heck, I could probably go to somewhere closer, one of the clinics where I work – and get hooked up to an IV and get some fluids, if I need them. I also could access an antibiotic, if I was severely ill enough that I needed an antibiotic. I could access those things pretty easily, right?

Justin: Mm-hmm.

Sydnee: So my expectation is that I would be just fine. If I live in a part of the world where there's nowhere to easily access oral *or* IV fluids, maybe both are at shortage, clean water is a problem, water period is a problem,

and then on top of that, if I am sick enough that I need antibiotics, am I somewhere in the world where I can access those easily? Are they affordable, is there somewhere who can prescribe them?

So once you start to add that into the equation, it can be a very big deal. And across the globe, diarrhea is a huge problem, especially for children. Young children all over the globe become severely ill, and it is fatal in many parts of the world. Not necessarily Cyclospora, but just diarrheal illnesses in general. So I think that's why it's important.

In the US, we're freaking out 'cause we don't like having diarrhea. For the rest of the world, these illnesses can be a much bigger deal. And certainly, in some parts of the US, that's true too. For—

Justin: Could— Go ahead.

Sydnee: For areas, like I said, where it's endemic, you usually are going to become accustomed to it, as you have more bouts of it. And so you may have even asymptomatic infections, meaning people who have the parasite and don't know it.

With outbreaks like we're having in the US right now, probably most of the people, or all of the people who are getting Cyclospora, have never had it before. So they're gonna have symptoms. It can last anywhere from a few days to a month. A lot of people, I think in the headlines, have heard that piece of it, like, "Oh, you're gonna have diarrhea for months." Most people aren't gonna have diarrhea for months, but you could.

Justin: [snorts]

Sydnee: I mean, that's the thing with this parasite. You could have recurrent bouts. It could even come and go, like you start to get better, and then a week goes by, and all of the sudden, you've got diarrhea again.

Justin: Hey. Love, I gotta tell ya, that was a real roller coaster of a paragraph, emotionally. You really took us on a journey there. Like, it's not

so bad, but then, you *could*. I mean, you *probably* won't have diarrhea for a month, but you *could* have diarrhea for a month. I mean, what do you want me to feel? [laughs] Should I be relieved?

Sydnee: I think it highlights the importance of us studying and putting money, research dollars, into understanding illnesses that don't necessarily affect Americans as frequently.

Justin: Mm.

Sydnee: You see this bias, that has always existed, where we are not that interested. I mean, there's a reason there's a whole body of illnesses that we call neglected tropical diseases.

Justin: Right.

Sydnee: Because they're neglected. Because they are not happening in resource-rich settings, where a lot of money is going to be put into understanding them better. And so when they do impact us in the US, we start asking the questions we always ask. How long, how much, what do I expect, what do I take? And we don't have clear answers, and people here get frustrated. And it's like, well, yeah, because we don't put money into researching this. We put money into researching all the stuff that people here get all the time.

Justin: Yeah.

Sydnee: We can give you lots of answers about—

Justin: Boner pills.

Sydnee: Oh, I was gonna say erectile dysfunction, but yes.

Justin: [bursts out laughing]

Sydnee: Yes. I mean, that—

Justin: [snorts, laughs]

Sydnee: And there are— And I'm not saying we shouldn't! This isn't me saying we shouldn't study that. That's a huge quality of life—

Justin: I'm just saying, we're world experts. [laughs]

Sydnee: Yes. [laughs] But that's a huge quality of life issue, and it should be studied, and we should know how to treat that. Also—

Justin: If it's a huge quality of life issue, you may have taken too much.

Sydnee: [chuckles] But two things can be true. We can study erectile dysfunction, *and* we can study Cyclospora. We have the ability. There's lots of money that could be put into these things. It just depends on what our priorities are.

So what's happening, in case you're interested, like what's happening when the parasite's in there? It's actually— The thing I like about parasitic infections – I know this is a weird sentence – is that it's a lot easier to understand, from a pathophysiology. Like, what is the parasite doing in your body? Because they're kind of— They're bigger. [laughs]

Justin: Mm-hmm.

Sydnee: They're more like little animals than bacteria, they really are. And so they're just kind of burrowing in the walls of your intestines, and messing it up. They're causing inflammation, they're causing fluid loss, and all that fluid is coming out through your intestinal tract, and you get diarrhea. It's really straightforward. When bigger parasites like worms get in your body, they're just kind of crawling around, squirming around in there, damaging everything.

Justin: Eugh.

Sydnee: It makes a lot of sense—

Justin: Like *Tremors*.

Sydnee: Kind of like that, yeah. If you're like me, when I learned about all of these different infectious organisms, I want to be able to see it inside you, and think about what it's doing. And then that's how I understand it, 'cause then it all flows from there. Once I understand what it's doing inside you, the symptoms that come from that...

Justin: Makes sense.

Sydnee: ... are intuitive. And with parasites, it's really clear. It's just digging into the intestinal walls, causing havoc.

Justin: Bad. Messed up. Holes where there shouldn't be holes.

Sydnee: Right. Anyway, most of the treatment is supportive. We gotta keep you hydrated. If you're able to stay hydrated orally, which most people would be able to, that's best. If you cannot, if you're so sick that you can't keep fluids in, then you need to be able to access IV fluids. And certainly, some people have been hospitalized for this. There is an antibiotic that is effective. I will say – and this is true for a lot of diarrheal illnesses – not everybody will necessarily *need* an antibiotic. There are many people who will...

Justin: Just get through it, yeah.

Sydnee: ... get sick and get better, and not require antibiotics. So don't rush and think every time you get diarrhea, you need an antibiotic. Most of the time, you don't.

For people who may be, again, on either end of the age spectrum or more susceptible to severe illness due to their underlying disease status, these individuals we can treat with something called Trimethoprim-sulfamethoxazole, or you probably know it as Bactrim. Most people have

heard of the antibiotic Bactrim, and it is an effective treatment. Because that is a sulfa drug, and sulfa allergies are one of the more common drug allergies, there are some alternatives like Cipro, if you can't take Bactrim. But it *is* treatable! And certainly, if you're having severe disease, we could do that.

That being said, what is happening right now?

Justin: I don't know. It's been in the headlines a lot lately.

Sydnee: Yes. It's been in the headlines. I think the latest total I have – I mean, really I *just* checked the CDC website for an updated total – 1,644 cases of Cyclospora that we know of, diagnosed cases. 94 hospitalizations, nobody has passed away. And the last diagnosed case we have is July 13th, which means maybe we've— Maybe we don't have any more new cases? Maybe we've caught 'em all? We don't know.

Justin: Here's hoping.

Sydnee: We don't know for sure.

What happened? Why did all these people get it? Well, as I mentioned, some of our surveillance for Cyclospora, we actually ended that program last year. And so we are not going to pick up these things as quickly. And because there's this lag between when you are exposed and when you might have symptoms, it can be hard to do the disease investigation and pin down exactly where it came from, especially when we're not surveilling for Cyclospora like we used to.

So we know that the most common outbreaks— And there have been a number of outbreaks in the US in the past. You can look through— The CDC has on their website, "Here are all the past outbreaks we've had, and what they were linked to." They've been linked to things like raspberries, cilantro, snow peas, mainly lettuce. Especially bagged lettuce. That seems to be one of the— Or in basil. Basil's another big one. But one of the biggest is those salad bags, or lettuce bags, that you get at the supermarket.

Justin: Mm-hmm. Mm-hmm.

Sydnee: Uh-huh. What is that?

Justin: No, I'm just—

Sydnee: You're saying salad...? [laughs]

Justin: I've been pretty firm about salad for a long time. I'm just saying, it sounds like the chickens are finally coming home to roost. Our vegan friends have been *pretty quiet* these past few weeks. And I'm just saying, maybe salad ain't all it's cracked up to be, [laughs] you know?

Sydnee: This— I mean, okay. This conversation gets so sticky, and it's so nuanced, because—

Justin: No, salad's never sticky. If it was sticky, it'd probably be better. It'd have syrup or something on it.

Sydnee: I— [laughs] I felt really lucky that, as they were saying, "Well, snow peas is a common culprit."

I was outside, picking the snow peas that I grew, thinking, "Well, I grew my own. I have my own basil, I have my own cilantro." I actually made Justin go out and buy a couple raspberry starts.

Justin: She didn't make me.

Sydnee: 'Cause we have blackberries, but I don't grow raspberries.

Justin: I was already— I was already on it.

Sydnee: Yeah.

Justin: And I have to go to Lowe's every day, legally [laughs] speaking.

Sydnee: It's a privilege to be able to grow your own food, though.

Justin: Yes.

Sydnee: That's not a ready solution for everybody. That's not realistic. For those of you who can, great. But for most people, that's not realistic. There is a recommendation that, generally speaking, buying a whole head of lettuce is thought to be safer than buying the bags of leaves.

Justin: There's only one thing safer than that. Leaving that lettuce right on the shelf.

Sydnee: [chuckles]

Justin: Where it belongs.

Sydnee: Obviously, you wanna wash your hands before you handle food. You want to wash your fruits and vegetables. Really, with Cyclospora specifically, washing everything, even scrubbing them and stuff, while that is always a good idea to wash your fruits and vegetables after you buy them from the store, before you eat them – of course, please do that – that's not gonna kill Cyclospora. You have to heat food to 158 degrees to kill it. And I think most of us don't cook lettuce, so that's rough. That's a rough one.

Justin: Love a hot salad. [chuckles]

Sydnee: I know. So we do think they might have figured out where this is coming from. So what they did is they started asking people who were sick, who have confirmed cases. Which, by the way, it can be hard to diagnose Cyclospora, because you're looking at the stool. Regular stool panels usually don't test for it. You have to look at the stool under a microscope – I've done this before, in my training – for the specific form of the unsporulated oocyte.

Justin: I really love that word, by the way. As much as I hate oocyte, I *love* unsporulated.

Sydnee: You like unsporulated?

Justin: That's— Oh, say it again.

Sydnee: [laughs] Unsporulated. You have to know what it looks like, and it can be hard to find. You gotta look through a lot of poop to make sure it's not in there. Like, how many slides until you can say absolutely not, or—

Justin: [crosstalk] Gets a lot of [crosstalk].

Sydnee: You gotta look through a lot of poop. So it can be hard to diagnose. Now, there is a PCR, polymerase chain reaction test, meaning we're actually looking for DNA. That's a faster— But it's more expensive, so there's a tradeoff there. It can be harder. Anyway, it can be hard to diagnose.

We think— So initially, there was an announcement from the FDA that, after they investigated all these cases, they found that most of them were linked to eating at a Taco Bell. Like, 90 percent had had lettuce from a Taco Bell. So they thought, "Ah. It's this kind of bagged lettuce that these Taco Bells are getting, and specifically supplied by Taylor Farms of Mexico."

Justin: Hey, by the way, I hear you out there. I don't get lettuce on my tacos. No, nice try.

Sydnee: I do, but I hadn't in that time period, I guess. But let me say – now, listen – the FDA announced, "We think it's linked to these. We tested these bags of Taylor Farms lettuce that were supplied not just to Taco Bells, but also to a number of grocery stores," like Walmarts were selling these bags of lettuce as well. "And we thought we detected *Cyclospora* in two of these bags, so we think we found it. This is the link."

And so then Taylor Farms—

Justin: It's not Taco Bell?

Sydnee: Well, hold on. Taylor Farms did a voluntary recall on the 17th. On

July 17th, this is really brand new, of all of their Taylor Farms lettuce products. Taco Bell stopped serving them. They recalled them from all the grocery stores, and then they told everybody, "Check your bags. If you have bought lettuce of this brand in this time frame, throw it away. Don't eat it, okay? We think we're good."

Justin: Got it.

Sydnee: And then, yesterday, [laughs] July 19th, the FDA provided an update saying that, due to the complexity in the detection of Cyclospora, FDA laboratory experts re-reviewed the sample results and have concluded that the finding does not represent true amplification, and should be considered a false positive.

Justin: So we don't know.

Sydnee: Taylor Farms said that the FDA called them and apologized. The FDA has not [laughs] clarified if they did.

Justin: [laughs] "We don't do that, actually."

Sydnee: But here's the thing. It was a false positive. We don't know. The voluntary recall is still going through. They're still saying, "Don't eat this lettuce, because we did have this one finding." There was some evidence, just based on report, that maybe it was linked to this lettuce, but we have not confirmed it. As of this moment, we have no confirmed positive samples of Cyclospora in any specific product.

So as of this moment, we do not know if it was from this lettuce, if it was something else. We do seem to have a common link with a lot of people having eaten at Taco Bell in this time frame, so... But I mean, right now, we're gonna have a lot of confirmation bias, because everybody who has diarrhea is gonna go, "Well, but did I eat at Taco Bell?" Because we've all heard this report about Taco Bell.

Justin: This has RFK's fingerprints all over it. You can tell here.

Sydnee: What?

Justin: Yeah, yeah, yeah, yeah. Oh, yeah. Taylor Farms de Mexico? Hmm, interesting. And the other person they're trying to blame for it is Taco Bell? Huh, I don't think so, guys. I don't think you're gonna make those charges stick, my friends. I think that you probably need to look elsewhere. I swear, Sydnee. This is RFK trying to shut down—

Sydnee: You putting on your tinfoil hat here?

Justin: What?

Sydnee: You putting on your tinfoil hat?

Justin: I'm just saying, it's very interesting that the Trump-run FDA accuses Taylor Farms de Mexico. I think they were trying to target— I don't know. I'm just raising a conspiracy theory for no reason. Hmm.

Sydnee: Well, it would be convenient...

Justin: What does it mean? You tell me. [chuckles] I don't know.

Sydnee: ... that when you reduce funding for surveillance *for* Cyclospora, and then the following year you have a large Cyclospora outbreak across multiple states, where many people are ill and some are hospitalized, it would be convenient if you could then just blame the whole thing on Mexico, I guess.

Justin: Yeah. Hmm. Or Taco Bell.

Sydnee: I will say that, at this moment, that's—

Justin: Both of which are currently non-guilty, by the way. I should reassert—

Sydnee: We have no proof. We have no proof.

Justin: Reassert, I rode with the Bell last night. Your boy's here. I'm here. I'm not gonna let you down. You will beat [through wheezing laughter] these charges.

Sydnee: We do know that there have been cases, just in case you haven't been following this as closely, I said in West Virginia, in Ohio, in Michigan, in Kentucky, in Indiana. Michigan's been hit the hardest so far. But if it was from this Taylor Farms lettuce, that product was distributed in multiple other states. I'm not gonna list them all; there's lots of them. But you can go to the FDA update. If you look at FDA update from July 19th, it'll give you this whole paragraph and exactly what states where the Taylor Farms lettuce could have been distributed.

Justin: Okay, I was joking.

Sydnee: It's worth checking— If you did buy bagged salad, whatever company it's from, bagged salad has been a culprit in these outbreaks in the past.

Justin: How are you parsing stuff— I was kidding, of course, about RFK and Trump and everything. But how are you parsing stuff from the FDA currently? Because as we've established, there's obviously a lot of good scientists, and a lot of good people in that organization. But what kind of filter are you running this kind of stuff through?

Sydnee: Well, I think that—

Justin: For yourself personally, I should say.

Sydnee: When you've got something like— I mean, this is a multi-state outbreak of an illness. So you have multiple-state health departments, and probably county health departments, and then the hospitals in these locations, and the labs that are running these tests and accumulating this data. We're not gonna get lies about the numbers of cases, as far as we

know. Do you know what I mean? The sheer data that's coming out, the conspiracy that would have to be involved across multiple states— And not all these states are gonna kowtow to the current administration. So that kind of stuff, I can trust.

Justin: Mm, I get what you're saying, yeah.

Sydnee: You know, all the data that's coming out of these hospital systems, healthcare systems, it's probably all fine, right? We can assume that's true. As much as we can diagnose Cyclospora, yes. I think what you need to look at is the lens that is cast over this not necessarily in these reports from the FDA or from the CDC, but when you hear people talking about it who are politically motivated.

Justin: Mm.

Sydnee: So if we see the press secretary reporting on this, whatever spin is put on it, I would question. I don't trust anything RFK says, ever. I don't—

Justin: Yeah. I mean, you can't.

Sydnee: He has done so much damage to vaccination rates in this country, contributing to the subsequent illness, and then unfortunately death, of children.

Justin: Yeah. RFK's lies contributed to the death of children.

Sydnee: Yeah. Those lies have contributed to the death of children, and so I do not trust RFK for any information. Whatever he says, I don't trust. But this kind of data, you can't undermine *all* of these local health departments and local healthcare facilities who are working really hard to try and understand, accumulate the data, and then control an outbreak of something. Although you can't really control the outbreak of... All you can do is figure out where it came from, and get it off the shelves.

Justin: Ban lettuce!

Sydnee: [laughs] And advise people—

Justin: Prematurely. [laughs]

Sydnee: I mean, if you're advising people, "Don't buy bagged lettuce, buy a head of lettuce right now," that's reasonable advice to give.

Justin: How much do you freaking need lettuce that you are willing to risk explosive diarrhea for it!? What's *wrong* with you people? Just don't eat lettuce!

Sydnee: It's—

Justin: *God!* [laughs] "Are the heads of lettuce okay?" Just don't eat lettuce!

Sydnee: It's just—

Justin: I've been doing it forever! It's easy!

Sydnee: It's a really complex issue, though. Because—

Justin: It's not! Don't eat lettuce!

Sydnee: No, we live— Well, listen. Whatever you think of it, we live in a globalized economy. And so we are going to have food products coming in and out of different countries— This is not just for the US. Coming in and out of different countries that were grown and handled and processed very far away, where the natural pathogenic flora is very different.

Justin: Mm.

Sydnee: And that population of people has built up immunity to things that are endemic in a way that maybe the receiving population hasn't. And vice versa, right? That goes both ways.

Justin: Mm-hmm.

Sydnee: So how do we reconcile that, and then also continue to live in a global economy, and then also survey for these things, and make sure we're monitoring, and then be *as* concerned about these illnesses in the countries we *don't* live in as we are here? I mean... It's a very complex topic. And to just say, "Grow your own food," yeah. That'd be great. It's a privilege to do so. It's expensive.

Justin: It's not our society anymore.

Sydnee: No.

Justin: We're just not built for it.

Sydnee: It's expensive, and time consuming, and it is— I'm very lucky that the little bit of stuff that I grow, because I enjoy it for fun, I can do. But I could not feed our family. I couldn't do it!

Justin: No.

Sydnee: We're gonna have to go buy groceries, and we're going to eat at Taco Bell. And so we need to live in that reality, and find a way to make that safe, right? For everybody.

Justin: Yes. If everybody stuck to Utz pretzel rods, like I have been suggesting, [laughs] *none* of these problems would happen.

Thank you so much for listening to our podcast. It's called *Sawbones*. We want to thank The Taxpayers for the use of their song, "Medicines." It's the intro of our program *and* the outro, and has been since we started it way back in 2013. So that's it. We really appreciate them, and they're playing out. They have a Bandcamp. You can go see them live sometimes. Go check out the rest of their music. It's really good.

Sydnee: Yeah. Absolutely.

Justin: There's also different versions of that song, if you like that song. It's a kick. I would like to personally thank everybody that came out to the *TAZ* book launch. If you didn't pick up your copy of *The Adventure Zone: Story and Song*, that's our last *Adventure Zone* book. And if you wouldn't mind grabbing a copy of that, I would really appreciate it.

Sydnee: It's really wonderful. It made me cry.

Justin: Thank you.

Sydnee: In a good way.

Justin: That's gonna do it for us, for this week on *Sawbones*. 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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