

Sawbones 209: Legionnaires' Disease

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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 you 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: Well, Syd, I didn't know that three-year-olds could be depressed, but that's certainly what we've got on our hands.

Sydnee: Well, unfortunately that's true, Justin. We've tried our best.

Justin: Yeah. We've tried to make up for it, but it is not working. We took our daugh—

Sydnee: No. With all the—all the usual three-year-old tricks, like popsicles—

Justin: Poofs, the whole nine yards.

Sydnee: Yeah.

Justin: Uh, we took our daughter to Disney world for the first and we didn't know if she would, like, be crazy about it or not? Um...

Sydnee: We didn't know if she was old enough yet.

Justin: To really enjoy it. Um, but we took her and, well... she loved it, and now—

Sydnee: That's the good news. That's—that's the—let's start with the good news. The good news is she loved it.

Justin: [simultaneously] The good news is she loved it.

Sydnee: She met all the princesses. She loved it.

Justin: Yeah. The bad news is that we sometimes will just find her crying? [pauses] And we'll ask what's wrong, and she'll say, "Our house isn't Disney world."

Sydnee: She wants to live at Disney world now.

Justin: Right. And that is—as a parent, like, I can't. I mean, obviously there are, um... roughly 40 people that live in Bay Lake that are Disney employees—

Sydnee: Okay. No. We can't go through all of the Disney—

Justin: Bay Lake is a—

Sydnee: No.

Justin: —city town. I mean, it's owned and operated—

Sydnee: [simultaneously] Justin has become—

Justin: —by Disney, but they do have a municipal government with a duly elected mayor, and all the regular things, except they basically rubber stamp the things that Disney wants.

Sydnee: I have heard this several times. Justin has become—

Justin: Lake Buena Vista is also—

Sydnee: —obsessed with Disney world minutiae—

Justin: I just think it's an interesting story.

Sydnee: —and history.

Justin: It's fascinating. There's no place like it on Earth. Anyway, um... she's really depressed 'cause she wants to go back to Disney world, so I don't know how we're gonna make that happen, but... I guess we legally have to now, at this point?

Sydnee: Well, we can go back. I mean, we can legally make that happen.

Justin: Mm-hmm.

Sydnee: But I don't think living in Disney world is gonna...

Justin: Um, we've learned—we've learned some things that will help us along the way. One is, we don't wanna stay at the resort that is literally a hundred thousand miles—

Sydnee: Yes.

Justin: —away from Disney world.

Sydnee: We will try to avoid that.

Justin: Yeah.

Sydnee: And two, it was probably a good idea, uh, recently, that we went to Disney world and not Disneyland.

Justin: Why's that, Syd?

Sydnee: Well, because, as you may have heard, unfortunately Disneyland, which is in California, in Anaheim, I believe—

Justin: Correct.

Sydnee: —has had an outbreak—not in Disneyland, I should say, but people who went there... among them, there has been an outbreak of Legionnaires' Disease.

Justin: Okay. Now, sometimes I have some base familiarity. I have to admit that I know literally nothing about what you're talking about.

Sydnee: Do you even know why it's called Legionnaires'?

Justin: I don't know what it is, so that would be very impressive if I knew what it wa—how it was called that.

Sydnee: That's good. That's a good jumping off point for me, because I kind of assumed everybody already knew this story, but I think that's the kind of assumption you make...

Justin: When you're you.

Sydnee: ... when you're a nerd. [laughs]

Justin: [through laughter] Right, okay, yes.

Sydnee: When you're a—when you're a medical history nerd who is immersed in the world of medicine all the time and goes, "[nasally] Well, I mean, hasn't everyone heard this story?"

Justin: "[nasally] Obviously. Certainly. Obviously this is one of the most well known and beloved fables."

Sydnee: [laughs] Uh, so I'm gonna talk about Legionella and the disease it causes, one of 'em—Legionnaires' Disease. Uh, thank you to those who have recommended this topic. Sid—not me, other Sid. Alternative Sid.

Justin: Different, parallel universe Syd.

Sydnee: Parallel—parallel universe me Sid—Chris, Emily, Claire, and Stefan. Uh, this is—I would say this isn't one of our usual topics on *Sawbones*. It is medical history. It is, I think, a really cool story. It's not really one where we mess up too much?

Justin: Okay, good!

Sydnee: So that's kinda nice.

Justin: A nice refreshing change of pace. Everybody needs a little light.

Sydnee: Yeah.

Justin: In their *Sawbones*.

Sydnee: It's a lot more modern, too. So we—you know, we don't get to, like, feature Pliny the Elder or any weird... you know, poultices in this one.

Justin: Right.

Sydnee: Uh, so our story actually starts in 1968, in Pontiac, Michigan.

Justin: Okay.

Sydnee: As most stories do. [laughs quietly]

Justin: All the greatest medical fables.

Sydnee: [laughs] Uh, there was an outbreak of some sort of febrile illness that occurred, largely among people who worked at a local health department. Uh, and then some—some people who had visited the health department, who didn't work there but who had been there recently, also developed the illness. It was a fairly mild febrile illness—febrile meaning the got fevers.

Justin: Right.

Sydnee: Fevers, body aches, felt unwell. Kind of what we'd think of like now as a... a viral syndrome, we would say. You know—

Justin: Okay, just felt kinda puny.

Sydnee: Yeah. Got sick, got better later. It was a strange outbreak—

Justin: There it is, folks. That's illness in a nutshell.

Sydnee: [laughs] Hopefully.

Justin: There you have it. Straight from the pros.

Sydnee: I mean, hopefully that's the—that's the end. Uh, got sick, got better later, but nobody was sure what it was. It was very interesting, because they couldn't pin it on a flu or a cold, or any other kind of illness that was going around, so they called it Pontiac fever.

Justin: That's very dramatic.

Sydnee: And—yeah, well, Pontiac, Michigan.

Justin: It sounds like a Pontiac ad. [unintelligible] "[car commercial voice] Pontiac fever. This Labor Day weekend, we've got Pontiac fever."

Sydnee: To be fair, they've got—Pontiac fever is not, like, the best ad anyway.

Justin: No. I mean, it's not the most original, certainly.

Sydnee: It's not—it's not the greatest tagline. But anyway, nobody knew what caused it, and so that was it. Now we fast forward a little bit in history to 1976. So, we're in Philadelphia. It's a hot summer, okay?

Justin: Okay.

Sydnee: It's July. It's hot. We are at the Bellevue-Stratford Hotel. Which is, like, the—

Justin: I feel transported!

Sydnee: Yeah. It's a beautiful old hotel. They call it, like, the Grand Dame or something. It's very well-known. I think, like, almost every sitting modern American President has visited it, or something to that effect. Anyway, a very famous hotel.

Uh, and in this particular point in history, the American Legion is holding their annual convention there.

Justin: Ohh, okay! I can kinda see where we're goin'.

Sydnee: You see where we're headed now? [crosstalk]

Justin: A little bit, yeah.

Sydnee: So, uh—and it's a very exciting year! It's the bicentennial.

Justin: Oh yeah.

Sydnee: Everybody's feeling very patriotic.

Justin: Huge.

Sydnee: There are more than 4000 members of the American Legion there to—to do whatever you do at an American Legion meeting. I don't know.

Justin: I really—I honestly...

Sydnee: Talk?

Justin: About... the...

Sydnee: America—

Justin: ... how the Legion is going? [laughs quietly]

Sydnee: The Legion—[laughs] I'm not sure. Are there hats? I think there are hats.

Justin: Oh, yeah. Definitely hats.

Sydnee: Uh, so they—so they were all present, and it was very hot outside, and many people were relieved to be staying in the luxury of the Bellevue-Stratford Hotel.

Justin: I'm sure, yeah. Hot day? What better way to beat it than luxuriating in an air conditioned hotel.

Sydnee: Exactly. Ice cold, air conditioned hotel. Uh, and so everybody's in a great mood. Everybody has a great meeting by all accounts, whatever you accomplish—whatever you seek to accomplish—

Justin: They're wild about the Legion. They're all pumped up about Legion activities.

Sydnee: They—they—they accomplish this, these—these goals, and they all headed home, and everybody was happy. And everything seemed to have gone great, except... at this point, several days later, a strange illness begins to occur.

Justin: It's Legionnaires' disease, isn't it.

Sydnee: [laughs quietly] Are you ruining it—

Justin: Is that right?

Sydnee: —already?

Justin: [laughs] Sorry.

Sydnee: Jumping ahead?

Justin: Sorry.

Sydnee: So a strange illness begins to occur among people who were present at the meeting, and then a couple people who weren't actually Legionnaires, but who were around for some reason. Uh, and in some cases, this becomes quite severe. This is no Pontiac fever. This is a severe pneumonia that begins to develop. People become very ill. They were having fevers up to 107.

Justin: Whoa!

Sydnee: They were hospitalized, and unfortunately in some cases people even began to die.

Justin: Holy crap.

Sydnee: Uh, all in all, when we look back, there were around—and these numbers—every source I looked at, they were slightly different. They're somewhere around 200 cases. I've seen, like, 189 and 221 both quoted with similar frequency, but one way or another there were around 200 cases. And again, the number who actually died from the outbreak—somewhere between 29 and 34 I've seen cited.

One of the epidemiologists who actually was around at the time says 34, so I feel like that's probably—

Justin: That's what I would go with.

Sydnee: —probably right. But anyway, about that number—so, as you can imagine, people began to panic.

Justin: Sure, yeah.

Sydnee: Because it seemed to be kind of random. Everybody went home from this convention to their families, to their hometowns, wherever that may be.

Justin: And even though you swear to each other, "Hey, listen. This year we're definitely gonna keep in touch. I had such a chill hang with you at the Legionnaires meeting." They didn't necessarily, so they weren't, like, looped in with each other.

Sydnee: No. No, the only—actually, the only way they began to notice that it was an outbreak and not just a bunch of random cases of pneumonia—uh, there was one physician who had three patients who lived in the same area, went to this convention, came back, and all got sick with similar symptoms. And so that physician was the one who actually put it together and then reported it and said, "I think there's something going on," and then began to link all the cases together.

And this of course caused a panic.

Justin: Of course.

Sydnee: Uh, because it seemed mysterious. Nobody knew why people were getting sick. It didn't spread like you think of an outbreak. The people's families weren't getting sick.

Justin: Hm.

Sydnee: So it wasn't necessarily people you were around.

Justin: Right.

Sydnee: So it seemed random. Um, there had been an outbreak of swine flu earlier that year, and everybody was very worried about that coming back.

Justin: It was on our minds, yeah.

Sydnee: That was on their minds. Uh, parrot fever, which we've talked about before. [laughs quietly]

Justin: Yeah.

Sydnee: Was—was something that was prominent at this point in history. So, there were a lot of things—and I also saw mentioned that Micheal Crichton's *Andromeda Strain* was popular. To be fair, I checked that out. That was 1969 when that was published, so we're, like, a few years past.

Justin: Yeah. I think there was a—but wasn't the, uh—

Sydnee: There was the—the—

Justin: —*The Omega Man*?

Sydnee: Maybe. But anyway—

Justin: I think *The Omega Man* was out around that time period. Well, *Omega Man* was '71. I just looked it up, so... huh.

Sydnee: But there—there were rumors flying everywhere. People began to think, was this some kind of an attack? Point being that everybody was freaking out. There were all these rumors. Was it an anti-war activist attack? Was there—was this a poison? Was this a toxin? Some people thought it was [holding back laughter] radiation.

Justin: Sure.

Sydnee: I think Bob Dylan wrote a song about it.

Justin: Okay?

Sydnee: Legionnaires' Disease. [laughs quietly]

Justin: Okay?

Sydnee: Uh, the—

Justin: Not one of his biggest hits, I'm assuming.

Sydnee: [laughs] The hotel ended up closed out of fear, uh, for a while. For, like, two years.

Justin: Because they thought something was...

Sydnee: Coming from the hotel.

Justin: ... askew in there somehow?

Sydnee: Yeah, something was coming from the hotel. The CDC launched what was the largest investigation in its history. Uh, 20 epidemiologists were sent to the city. [laughs quietly] Which sounds very dramatic but, I mean... and I mean this with all the love in my heart... like, 20 epidemiologists, it's not like, you know... like Ocean's Eleven. [laughs]

Justin: It's not like—right. Some—yeah.

Sydnee: I—I love you, epidemiologists. I think you're very cool, but...

Justin: Yeah.

Sydnee: But look who you're talking to.

Justin: Right.

Sydnee: Uh, so anyway, researchers spread out all over Pennsylvania. They traced where all attendees went—were from, and went to their houses if they were sick and interviewed them—

Justin: Do you think they did one of those cool maps with the string on it?

Sydnee: They did. They had maps with pins.

Justin: Cooool.

Sydnee: For cases.

Justin: Love that.

Sydnee: Yellow for cases, red for deaths. Um, they interviewed everybody about their symptoms. Every move during the convention, how many times did you ride in an elevator? Did you eat breakfast and where? Who was your roommate? All that stuff. Extensive histories.

They checked everything. Kitchens, ice machines, toothpicks. Uh, cooling systems. They crawled around in air ducts. Everything, to try to find...

Justin: The source of this.

Sydnee: ... the source of this illness.

Justin: Now, was it a persistent thing? Or, I guess—or was it just like this one outbreak? Like, it wasn't, like...

Sydnee: It was a—it was a self-limited outbreak. It seemed to be that there was a—there was a limited number of people who got sick. Now, they didn't all get sick at the exact same time, because as we'll learn, the incubation period somewhat varies from person to person. But they all got sick, and then they either got better or didn't, and that was it, and it did not continue to spread from there.

Justin: Huh. Okay.

Sydnee: So it wasn't like something they were trying to contain. It was more a mystery to solve.

Justin: Okay.

Sydnee: Uh, think about it more like from the perspective of, a murder has occurred and we need to solve it.

Justin: Ohh, call—

Sydnee: That kinda—

Justin: —and we need to call—

Sydnee: No.

Justin: —the greatest detective, Hercule Poirot.

Sydnee: Oh no. Oh, I shouldn't have even said that.

Justin: Look at his... green eyes shimmer, Sydnee, as the case... because he's come to make use of his little gray cells. Order and method.

Sydnee: So, the illness was—this was highly covered by the press, as you can imagine.

Justin: Of course, yes.

Sydnee: Yes. The press was all over this. There were, like, Time Magazine cover articles. I mean, like, the Time Magazine cover was about the search—was about the epidemiologists. They *were* kinda rock stars.

Justin: I guess, yeah! Why—let 'em have this, Sydnee!

Sydnee: There were kinda cool.

Justin: You're trying to tear 'em down.

Sydnee: No! I just—I—it sounded very dramatic. Like, "The CDC launched the biggest investigation in its history, sending 20 epidemiologists to the city of Philadelphia."

Anyway, it was—it was considered this—this big, cool mystery they were trying to solve. Um, most of the press started referring to the illness as Legionnaires disease, because it was... happening to Legionnaires.

Justin: The American Legionnaires, yeah.

Sydnee: Uh, some started to call it things like the Killer Fever, or the Philly Killer.

Justin: Boring. Phil—okay, Philly Killer—

Sydnee: Philly Killer's a little better.

Justin: —Philly Killer drips off the—trips off the tongue a little bit better, but...

Sydnee: Uh, but it was very dramatic. Everybody was very scared. And researchers were not immediately turning up many results. They had not figured it out. So this even led—actually led to, like, a congressional hearing. They had to, like, testify before Congress as to why they hadn't figured this out.

Justin: Okay.

Sydnee: And what was going on, and where were they in their investigation?

Justin: Wow.

Sydnee: I mean, people were taking this very seriously.

Justin: Yeah.

Sydnee: Which, again, does seem kind of strange, considering that it was a self-limited thing. It wasn't, like, continuing to spread. Um, but people wanted to know what happened. And at one point, one of the leading epidemiologists actually kind of made the public comment, "We might never know what caused this," and people *did not* like that.

Justin: No!

Sydnee: No.

Justin: You can't leave us hanging!

Sydnee: No. No one liked that answer.

Justin: No way!

Sydnee: Um, that was a very—I like that. It's a very honest science answer, but people don't like that. So amid all this public pressure and criticism, a microbiologist named Joseph McDade was taking a night off, hanging out at a Christmas party. This is how long this has been going on, by the way. This happened in July. We're now at Christmas.

Justin: He's, like, the hero, right? He'd be, like, played by Josh Brolin in the movie, yeah.

Sydnee: Sure.

Justin: Okay.

Sydnee: Yes. And he's, uh—he's hanging out at a Christmas party, and another guest—we'll give 'em the benefit of the doubt and assume that maybe he'd had one too many glasses of champagne or something—starts kinda giving him crap. And saying, like, "[dudebro voice] Heh, CDC. You guys are really great, huh? You and all your epidemiologists. You're really crackin' this case."

Uh, and starts to give him a hard time. And this must've gotten to him, because, uh, shortly after Christmas, McDade decides to skip his vacation...

Justin: Whoa.

Sydnee: ... and just lock himself up in the lab to follow up on some hunches he's had. So, they have all these samples, right? They've collected all this stuff from both the hotel and from patients. They've gone to visit all these people who were sick and got probably samples of every bodily fluid that they could find, and even had, like, slides of their lung tissue, had gotten samples of their lungs and put them on slides to look at them under a microscope, to look for... germs.

Justin: The—the culprit, yeah.

Sydnee: Yeah, to look for germs. So, he started reexamining all the evidence and going through it, and this took a while, but he finally noticed a bacteria that he hadn't really noticed before.

Justin: Dun dun dun!

Sydnee: And he started to compare samples, and he found it in multiple cases, and they called the bacteria *Legionella pneumophila*.

Justin: Kinda just, like, taking the lead from the press.

Sydnee: The Legionnaires, *Legionella*. So, there you go. Um, and we finally had the culprit. Uh, it's—it's interesting, because they looked back—this bacteria had actually been isolated before. They had slides of this on record at various, like, government health organizations, but it was thought to be something that only

affected animals and didn't have any clinical significance. So, we'd had the culprit all along.

Justin: We had it, we were so close! We had 'em right where we wanted 'em.

Sydnee: Uh—

Justin: Keyser Soze.

Sydnee: You know what's funny is they never actually were able to find the source in the hotel. Um, despite what I'm gonna tell you was the air conditioning system. They weren't ever actually able to isolate it, despite the fact that, like I told you, they were crawling around up there swabbing all those ducts.

Justin: Mm-hmm.

Sydnee: Um, because it had been cleaned prior to all of the investigation being launched, because people were sick.

Justin: Ohh.

Sydnee: So they already cleaned everything.

Justin: The perfect getaway!

Sydnee: [laughs]

Justin: The perfect crime, in and out!

Sydnee: But the—but the prevailing theory—

Justin: The *disease* has been Ocean's Eleven this whole time!

Sydnee: —they actually even isolated it to a specific air duct that they think that was responsible that, um, both filtered out into the lobby, where a lot—where pretty much all of the people had been at some point, in the lobby, and then also onto the street outside, which is why there were a couple cases among people who hadn't actually been attendees.

Justin: Hmm.

Sydnee: So—and it was probably because it was spraying little droplets of air onto the street outside as well.

Justin: Grody.

Sydnee: Onto the—onto the sidewalk, so.

Justin: So, I gotta hear more. Certainly this isn't the end of the Legionnaires story.

Sydnee: It's not. But before I tell you the end of the story, let's go to the billing department.

Justin: Let's go!

[theme music plays]

[ads play]

Justin: Okay. Sydnee, I need more Legionnaires disease.

Sydnee: Okay. So, they figured it out, right?

Justin: Yeah.

Sydnee: We have finally—we found the bacteria, we know what caused it. It was one that we had in our grasp all along, and we just hadn't pieced it together, and then those brilliant epidemiologists did it. I feel really bad about what I said about the epidemiologists now.

Justin: You gotta let it go, sweetie.

Sydnee: I know. I wanted to be one for a long time. I kind of shifted gears. But I—can I get that out there? I really admire epidemiologists.

Justin: That's—no, that's wonderful.

Sydnee: They're, like—they're, like, scientific Sherlocks, and they're brilliant, and... anyway. I just needed to say that. [laughs quietly]

Justin: Great!

Sydnee: I love epidemiologists. So, they were able to go back and figure out that there had been past outbreaks of Legionella, uh, that had occurred, that they just didn't know that's what they were, right?

Justin: Oh, because we didn't have—we didn't—yeah.

Sydnee: We weren't able to isolate the bacteria. Well, now we did, so now we could figure things out based on symptoms and pattern. And in addition to the fact that sometimes in outbreaks they would collect blood samples, and then hang on to them. Blood samples, body samples, spit samples, whatever samples they could get, and then hang on to them in the lab in case maybe someday we'll crack this case, right?

Justin: Mm-hmm.

Sydnee: One of those cases that they cracked is the Pontiac fever case. They had old samples, they analyzed, they found the Legionella bacteria in there too, which is why Legionella, the bacteria, can cause two distinct illnesses: Pontiac fever—

Justin: Okay!

Sydnee: —as well as Legionnaires disease.

Justin: Ohh, alright.

Sydnee: Same bacteria, just slightly different presentations depending on what gets—what gets infected, basically. Um, in addition, they also cracked an old case—well, not that old. Just a couple years before in 1974, where three people had died after a meeting at the same hotel.

Justin: Wow.

Sydnee: There was a meeting at the exact same hotel in 1974 of the Independent Order of Odd Fellows.

Justin: The IOOF?

Sydnee: Yes. And three people had died after that meeting, and they went back and realized that that had been also an outbreak.

Justin: But that had just been sitting there dormant the whole time.

Sydnee: Uh, probably the ducts had been cleaned in between.

Justin: Okay. Wow.

Sydnee: I mean, otherwise, like, why did you have an outbreak in '74 and then an outbreak in '76, and nothing in between?

Justin: Well, why did it—okay, yeah. I mean, yeah, but, like, why was it happening?

Sydnee: Why was—

Justin: Like, why at this same place would it happen twice?

Sydnee: Uh, it probably has to do with how often they were cleaning these systems.

Justin: Ah, alright.

Sydnee: So, there you go. I'm sure they're very clean now. I am not throwing shade at—at this hotel. Which is—

Justin: Oh yeah, you think? [holding back laughter] After the 30 people died there? They're probably *real* good about duct cleanliness at this hotel.

Sydnee: I think it's, like, a Hyatt now.

Justin: Okay.

Sydnee: So I don't think it—I don't think it has the same name. I think it's some sort of Hyatt.

Justin: Okay.

Sydnee: Uh, but anyway, no, it's quite clean.

Justin: Do you want me to google that? I haven't googled something in a long time on the show.

Sydnee: If you wanna google it you can. I didn't know if you wanted to tell everybody what the Independent Order of Odd Fellows was.

Justin: Um...

Sydnee: Or just let everybody look it up for themselves.

Justin: Uh, you can fill everybody in if you want. There is a building that says—I only know about it because there is a building, um, called the—there's a building labeled IOOF downtown, and I got curious about it one day, because I'm a curious young man.

Sydnee: Well, let's just let everybody google that and figure it out.

Justin: Just google it, go check 'em out.

Sydnee: 'Cause I—I did, 'cause it—I mean, it's an interesting name. You don't come across names like that all the time.

Uh, so here's the thing about Legionella.

Justin: Hyatt at the Bellevue.

Sydnee: There you go. Uh, Legionella likes fresh water, so it can live out where there is fresh water, out in ponds and lakes and whatnot, right? And the typically live inside little protozoa like amoebas and things like that. The bacteria actually live inside of them, they have, like—

Justin: Very creepy.

Sydnee: —a symbiotic relationship. Is that creepy?

Justin: Yeah.

Sydnee: Does that bother you?

Justin: I don't like symbiotic relationships.

Sydnee: So—[laughs] so they're just out there.

Justin: Except ours. But other than that.

Sydnee: But they can also—

Justin: Although ours is really more parasitic. [holding back laughter] I've—I've kind of just, like, leeches on to you and... won't let go.

Sydnee: Aww, that's not true. I don't think that at all. We're definitely in symbiosis.

Justin: I—I edit the show, I guess.

Sydnee: [laughs] But, uh, they can grow in man made water sources as well, so...

Justin: Like air ducts, apparently.

Sydnee: Like air conditioning systems. Like cooling towers, showers, faucets, hot tubs, fountains, hot water heaters, plumbing systems—anything like that, Legionella can grow in.

Justin: This is tripping me out.

Sydnee: Yeah.

Justin: There's a lot of places with water, Sydster. Have you thought about this?

Sydnee: I know, there's lots of places with water. One of the places that gets a lot of press are hot tubs.

Justin: Oh yeah, I think I've actually heard that before, now that you say that.

Sydnee: Yeah. So, Legionella in connection with hot tubs. Now, this is not—

Justin: Wouldn't it cook 'em, though? It seems like they get hot enough that it...

Sydnee: They like warm water.

Justin: Oh, man. But it gets really hot, though.

Sydnee: It doesn't get hot enough to kill 'em.

Justin: Oh, it may have to get, like, over 140, I guess. [pauses] Right?

Sydnee: Prob—prob—I—

Justin: Wouldn't that do it?

Sydnee: —I don't know exactly what temperature kills Legionella.

Justin: Oh.

Sydnee: I know they like warmer water. Different bacteria have different thresholds.

Justin: Of course, yeah, that makes sense.

Sydnee: So yes, at 140 is a general—I mean, you're thinking of, like, boiling the water.

Justin: Yeah.

Sydnee: Yeah. So that's, like, a generally good idea, but I don't wanna—I don't know what temperature, exactly.

Justin: It's not boiling hot water, is it. That's silly.

Sydnee: No, you are—a hot tub is not boiling hot water. You would die.

Justin: The bubbles are from the jets.

Sydnee: Right.

Justin: Got it, yes.

Sydnee: [laughs]

Justin: Sorry. Okay. Moving on! Let's say some other science.

Sydnee: So hot—hot tubs are not, like, the biggest source of Legionella, but when it happens I think it's scary, and a lot of people have hot tubs, so you hear a lot about it. Um, you can get it from being in the hot tub, but you can also get it from just being around the hot tub, which is, I think, what makes it especially scary.

Because what it is is—so, you know how when you're in a hot tub and it's like—there's all that, like, mist coming up from the hot tub as all those bubbles are, you know, bubbling around and popping around you and all that. So you're inhaling some of that.

Justin: Okay.

Sydnee: You're never gonna want to go in a hot tub again when you start thinking about this. So you're inhaling some of this, like—

Justin: [simultaneously] I'm not a big fan of 'em anyway, so—

Sydnee: —sweaty—

Justin: Sweaty bubble air.

Sydnee: —the sweaty bubble air is—you're just, like, in—you're inspiring this into your airways and your lungs.

Justin: Okay.

Sydnee: And so if there—

Justin: I don't *feel* inspired.

Sydnee: [laughs] If there is bacteria clinging in those little water droplets?

Justin: [horrified] Uh-huh?

Sydnee: You're also inhaling that. So that happens—

Justin: Ugh...

Sydnee: —if you just walk past the hot tub. I mean, if you get close enough to a hot tub—

Justin: So I can't even get close to hot tubs, is what you're saying.

Sydnee: I'm saying that it's possible, if the hot tub has been properly cleaned. For instance, 140 people at a Dutch flower show got it from just walking past these spas that were on display that had not been cleaned. There have been cases of people in, like, showrooms—like, going to places where they sell hot tubs, and they just, like, walk by the hot tubs, and then people get sick.

Justin: Jeez...

Sydnee: Because the hot tubs aren't being cleaned regularly, and so they get cases of Legionella...

Justin: Grody.

Sydnee: ... as a result. There is a way—the CDC has issued, like, guidelines on how to care for hot tubs. They're very easy to find. If you have a hot tub and this is scaring you now, like, go to the CDC website and look up hot tub care. There's a whole, like, handbook on Legionella and hot tubs. You just have to clean it and keep it at a certain pH, and the Legionella won't grow.

Justin: So, wait. If there's—if there's a source of it, and a bunch—like, say, there's a source of it and, like, a hundred people walk by it. Is it—is everybody gonna get it?

Sydnee: No. That's a great question. So, it—it actually—like, specifically that case I mentioned where 140 people got it, I think the attack rate that they called was, like, .2%. So, of people who walked by it, .2% got sick.

Justin: Mm-hmm.

Sydnee: Which is pretty low.

Justin: Yeah, all things considered.

Sydnee: The reason being that not everybody who is exposed to Legionella is gonna get it. It's largely people who we would kind of think of as, um, more vulnerable populations. So, um, people over 50 are more likely. Smokers or people with any kind of underlying lung disease, so, like, COPD, emphysema, chronic bronchitis, that kind of thing, are more likely to get it. People with diabetes. Um, any kind of reason that you might have a compromised immune system. So, because you have cancer, you're on some kind of cancer treatment, or you have an immunodeficiency, anything like that—kidney disease, liver disease, that kind of thing.

Justin: Okay.

Sydnee: So, for most people who don't have any underlying illness or are younger, you probably won't get it. Probably. More than likely you'll be fine. Um, and as I already mentioned, it can't spread from person to person.

Justin: Oh.

Sydnee: There's been one reported case of transmission from person to person ever. Generally speaking, it cannot be transmitted from person to person. You have to inhale it yourself.

Justin: How, uh—how will I know if I have it or not?

Sydnee: So, the symptoms are similar to a lot of pneumonias. You get cough, you get shortness of breath, fevers, chills, body aches, headaches. You might get some nausea, some diarrhea. Uh, confusion is actually reported a lot with Legionnaires disease. Um, but a lot of it is like a pneumonia, you know. You probably would go to the doctor, 'cause you would feel like you had pneumonia. You'd be pretty sick. Like I mentioned, the fevers can get really high.

Justin: Right.

Sydnee: Um, the symptoms usually start a couple days after exposure, so fairly quickly, although it can be a little longer. Most of the time the symptoms start pretty quickly.

Um, and like I said, you can also get from that same bacteria, Legionella, you can get Pontiac fever, which is the same illness without the pneumonia, so you don't get as sick.

Um, Pontiac fever generally does not require treatment.

Justin: Oh, good!

Sydnee: If you get that version of it, you'll get—like I said, you get sick, you get better. You may not even necessarily go to the doctor.

Justin: Ehh, I would probably wanna go just to make sure I don't have Legionnaires disease.

Sydnee: Well, no. I mean, you might not get sick enough to think you need to go to the doctor.

Justin: Okay.

Sydnee: Does that make sense?

Justin: Yes, yes, I understand.

Sydnee: Yeah. You wouldn't know you had it. Um—

Justin: I guess I could just tough it out, but...

Sydnee: Well, Legionnaires, you will get sick enough to go to the doctor. You will need antibiotics for this. Um, which we do have antibiotics that treat it very effectively nowadays. And, um—and we did when this happened. It's just people didn't know what they were treating, but we did have antibiotics then too that worked. Um, and then supportive care. I mean, some people if they get sick enough might need ventilator support or IV fluids or all kinds of things. But, um, but the sad thing about Legionnaires is that one in ten people with Legionnaires can die. So the fatality rate is not—

Justin: If left untreated? Or...

Sydnee: Gen—just period.

Justin: Yikes!

Sydnee: It's a serious illness.

Justin: Yeah, no kidding!

Sydnee: Yeah. So, I mean—and certainly our rates are better now than they used to be, now that we can identify it faster. Um, and then with some specific outbreaks they'll have only, like, 1% mortality rates as opposed to this. But the point is, you need to take it very seriously.

Justin: Okay, will do.

Sydnee: Uh, the world's largest outbreak—'cause it has happened since then. I mean, we've had isolated cases periodically ever since then. The world's largest outbreak occurred in Murcia, Spain, in July, 2001, and there were 449 confirmed cases, although it was estimated that there may have been up to 800.

Justin: Wow.

Sydnee: Just not all were confirmed. Like I said, not everybody always gets tested and proven right away. Um, it still happens, of course, in the US. There were about 6,000 cases reported in 2015, but again, it's under reported. People don't test for it. They treat you with antibiotics 'cause you have pneumonia and you get better and you never knew you had Legionnaires disease, that kind of thing?

Justin: Yeah.

Sydnee: 'Cause you do have pneumonia, so you get treated. Um, so it may be as many as 18,000 cases a year—

Justin: Dag!

Sydnee: —it's estimated. And it usually happens in the summer and early fall. And, as I mentioned, in Disneyland this past month they have had an outbreak of Legionnaires that led to the closing of two cooling towers, uh, in part of the park. Um, so far—and I saw this update from, like, three hours ago, uh, there have been 15 cases reported, and 11 of the people had actually gone to Disneyland. So some of them were in Anaheim but had not actually been in Disneyland.

Justin: They were just hangin' around in hot tubs.

Sydnee: Maybe. I don't know.

Justin: How could that be, though, if they were not there?

Sydnee: I don't know. I mean, I think they're—this is still... this is still unfolding. All they know is at least the majority of people who got sick had definitely been to Disneyland. They traced it to these two cooling towers, which were tested and did, in fact, have elevated levels of Legionella inside them, so that is a fact.

Justin: But we're not sure exactly what's happening.

Sydnee: But we're not sure all—exact—yeah, exactly. Uh, and those two cooling towers have been closed down and cleaned, and they're going to retest them, and if they're okay they're gonna reopen them, is my understanding.

Justin: Alright. Well, that's something. Um—

Sydnee: So they got it under—Disney's got it locked down.

Justin: Of course!

Sydnee: They've got it under control.

Justin: Mickey's gonna go up there and clean 'em himself. That's how he does it.

Sydnee: Um... I don't think that happens.

Justin: Uh, folks, that's gonna do it for us this week. We hope you have enjoyed yourself. Wanna thank The Taxpayers for the use of their song "Medicines" as the intro and outro of our program. Hey, uh, we're gonna be at Pod Con, December... I think 9th and 10th? Is that right? 8th and 9th?

Sydnee: Is that what that... Saturday? And Sunday?

Justin: I should make—I'm gonna be there... uh, it's 9th and 10th. Yes, confirmed.

Sydnee: [laughs]

Justin: 9th and 10th in Seattle, Washington, at the Washington State Convention Center. Um, it is gonna be really fun, and a lot of great shows are gonna be there. *Still Buffering, Sawbones, My Brother, My Brother, and Me, Welcome to Night Vale, 99% Invisible...* so many great shows. You're gonna go wild for it. And, uh, you can get tickets right now. Just go to PodCon.com. And, uh, that's December 9th and 10th, so go check that out.

Sydnee: So come see our shows!

Justin: Come see our shows! And, uh, thank you to you so much for listening. That is gonna do it for us but, uh... uh, thanks for, uh—thanks for hangin' out! And until next week, 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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[fighting and gunshot sound effects]

April: Oh! Sorry about that. Just had to dispatch some goons real quick. Hi, I'm April Wolfe, lead film critic at *LA Weekly*. And, when I'm not kicking butt, I'm hosting the new Maximum Fun podcast, *Switchblade Sisters*.

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