Sawbones 418: Radium Girls

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[theme music plays]

Sydnee: Hello and welcome to *Sawbones*: a marital tour of misguided medicine. I'm your cohost, Sydnee McElroy. And you are...

Charlie: Charlie McElroy, your daughter.

Sydnee: That's right! Charlie McElroy, my daughter, is helping host the show this week. But what are you doing over there right now, Charlie?

Charlie: I'm just watching this radium girls video. It's cool.

Sydnee: What—a video about who, now?

Charlie: Radium girls!

Sydnee: Oh! That sounds pretty cool. Do you think that's something you might wanna tell us about?

Charlie: Yeah!

Sydnee: Yeah? I think that might make a good episode of *Sawbones*, the podcast we're doing, like, right now.

Charlie: Yay!

Sydnee: Excellent!

Charlie: Could I help?

Sydnee: Of course you can help! I would love your help.

Charlie: Yay!

Sydnee: So... do you wanna start us off and tell us what you know about radium girls?

Charlie: So, the radium girls started in... I'm not quite sure the year, because I'm not sure it said that.

Sydnee: You don't have to have—I've got years. I've got places.

Charlie: Okay.

Sydnee: I've got all the facts. You just tell us the story. Tell you what, I'll give you some years. 1917.

Charlie: Okay. So, it all started in 1917. There were glow-in-the-dark watches, and they made—they needed delicate hands to paint on the paint, so they hired woman, and they—they harded—[through laughter] they hired women!

Sydnee: That's right. And girls.

Charlie: And—and girls. Just all female people. And—and they needed delicate hands, and very, very tiny brushes.

Sydnee: That's right.

Charlie: And they traced everything in glow-in-the-dark paint, and when they came home, they got paint all over themselves, so they started to get called the ghost girls.

Sydnee: Did they like that? Do you think they liked being all glowy?

Charlie: Maybe. Well, that's going on to the next part of our story. The girls had to use their mouths to get the brushes wet, and what was in the paint was radium. Mom, can you tell me what radium is?

Sydnee: Charlie, that's a great question. So, you know the periodic table of elements?

Charlie: Yes.

Sydnee: Have you heard of that? So they're all, like, the basic substances. I mean, not as small as atoms, but you get the idea, that everything's made up of. Radium is one of the elements. And the thing about radium is it gives off... radiation. Which isn't great for humans.

Charlie: So, radium was in the paint. They were getting the radiation into their body. And the girls were painting their faces, lips, and teeth with the paint. And some of them even took lunch breaks at their workspaces.

Sydnee: Now, did they know that the paint was dangerous?

Charlie: No. At the time it was, um, a cure for cancer, I'm pretty sure. So they thought of it as a good thing. And they started to put it in different things, like toothpaste and water and chocolate. All sorts of stuff.

Sydnee: Yeah?

Charlie: So then...

Sydnee: It all worked out great.

Charlie: It all worked out great.

Sydnee: And to this day, we put radium in our toothpaste.

Charlie: No! No, no, no, no!

Sydnee: No? No? What happened? Did something go wrong?

Charlie: There's more to the story. Something goes totally wrong.

Sydnee: Well, tell you what. Before we get into what goes totally wrong... let me—can I give you a few more facts? 'Cause this is a great start.

Charlie: Yeah.

Sydnee: This is a great story.

Charlie: Okay.

Sydnee: And I can fill in some of the blanks.

Charlie: Yeah. Fill in the blanks that I missed [unintelligible].

Sydnee: Well, it—you didn't *miss* anything. I'm gonna give you—it's called context.

Charlie: Oh.

Sydnee: I'm gonna give you some stuff around it.

Charlie: Okay, context. Got it.

Sydnee: Okay, context, yeah. No, you've done a great job. Fantastic job.

Charlie: Oh, okay!

Sydnee: So, like you said, female factory workers. 1917 was when it started, in a place called Orange, New Jersey. And then they also started similar factories in the early 1920's in Ottawa, Illinois, and Waterbury, Connecticut. Okay?

Charlie: Got it.

Sydnee: Those are the places and the times. Now, radium was first named—first discovered and named by Marie Curie, or Madame Curie.

Charlie: [gasps] Whoa, cool!

Sydnee: Yeah, the French physicist.

Charlie: Oh, that's amazing. I love her. She's amazing.

Sydnee: And she isolated it back in 1898, so a little bit before this. And do you know why she called it radium?

Charlie: Why?

Sydnee: Because it glowed, and it gave off its own light, like the sun. And what do we call the things that come down from the sun? The sun's...

Charlie: Rays! Ohhh.

Sydnee: Radium. There you go. Now, when she first noticed it was glowing and giving off radiation, we didn't know that that was a dangerous thing. Now if you saw a glowing rock—

Charlie: Yeah, we didn't know that it was bad.

Sydnee: Yeah.

Charlie: Radiation.

Sydnee: Yeah, now we kind of know that. When we see something glowing, it worries us. Back then, we didn't know. We thought it was, like, cool.

Charlie: Like glowing fungus or something like that, out in the woods.

Sydnee: And like you said, at the time nobody knew how dangerous radiation was. Even though Marie Curie did suffer burns, radiation burns from handling all these different things. And eventually she would die of something called aplastic anemia, which basically meant her bone marrow couldn't make cells anymore because of the radiation that she was exposed to. But we didn't know all that back then, 'cause it takes a while for all this to happen. So you can handle it for quite a while before anything happens.

Um, when Curie first discovered it—and you know she also discovered another element called polonium, and it's named for her home country of Poland. Polonium. Yeah, if you look at all the elements on the periodic table, they're all named for lots of things.

Charlie: Oh, cool.

Sydnee: There's, like, an Einsteinium. Who do you think that's named for?

Charlie: Albert Einstein.

Sydnee: There you go. Uh, and the breakthrough when she first found it had a lot of implications. Like, the way that we understand energy and physics and all of that, it fundamentally changed once we started to understand the idea that things can be radioactive and give off radiation. We just didn't know that yet, and Marie Curie taught us something totally new about the world around us.

Charlie: Mm-hmm.

Sydnee: Um, the applications at first seemed endless. Like, what could we do with this new thing? Well, first of all, we had already sort of figured out before, um, before this, x-rays. So you know what an x-ray is, right?

Charlie: Yeah.

Sydnee: What do we use an x-ray for?

Charlie: Uh, like, if—if a bone may have gotten broken, an x-ray to see if it's really actually broken.

Sydnee: That's true. So we can x-ray your body to look at your bones. It's a way of looking at your bones without actually, like, having to...

Charlie: Cut you open and do the...

Sydnee: Mm-hmm.

Charlie: And the other gross stuff. Ick.

Sydnee: Which is dangerous.

Charlie: [shudders]

Sydnee: And, uh—and specifically when it came to medicine and the human body, x-rays seemed to—or radiation seemed to have a lot of possibilities. Later during the war, World War I, Marie Curie would establish these little mobile x-ray units. They called them Petite Curies.

Charlie: [giggles]

Sydnee: Little Curies. Little x-ray machines.

Charlie: [laughs] That's cute.

Sydnee: Uh, yeah, it would be useful out in the field. And she also made these little needles that were empty inside, they were hollow inside, and they were filled with a gas that we now call radon gas, which could be used to sterilize tissue. Which could be used to, like, kill bacteria, keep a wound clean or whatever. And you could put that little needle in somebody and try to keep things clean after they had gotten an injury or something.

Charlie: That's really cool!

Sydnee: Mm-hmm. We have some safer ways of doing that now.

Charlie: Yeah. *Way*, way safer.

Sydnee: This was before—you know how we take antibiotics sometimes when we're sick?

Charlie: Yeah?

Sydnee: We didn't have those yet.

Charlie: Oh.

Sydnee: Those didn't exist yet.

Charlie: Eesh.

Sydnee: Eesh!

Charlie: Might've been a bad time.

Sydnee: Yeah. We needed those. That was a big—

Charlie: A lot. [laughs]

Sydnee: —that was a big turning point, yeah. So, ra—like you said, radium was definitely used in the early 1900's as a treatment for cancer. At the time, we barely understood cancer.

Charlie: Yeah. Barely.

Sydnee: Yeah, we barely understood it.

Charlie: Yeah. Like, almost not even at all.

Sydnee: Mm-mm. We didn't know who, or why, or how, and we certainly didn't know how to stop it or treat it. There was no—at the time, surgery was really dangerous. We didn't have good anesthesia. We didn't have good ways of keeping people clean, like, keeping wounds clean in surgery. So surgery was super dangerous. We didn't have any chemotherapy like we use for cancer now. So radiation was the thing we had. And it did *work*.

Charlie: It did *work*.

Sydnee: In some cancers, in some people.

Charlie: But...

Sydnee: But it had side effects.

Charlie: Yeah. Tons of side effects.

Sydnee: It worked to a degree, but it was also a dangerous treatment, so. But it was the only thing we had. And of course I mentioned it glows. Right?

Charlie: In the dark.

Sydnee: It glows in the dark. And people like that.

Charlie: What color is it?

Sydnee: Uh, it can give off, like, a greenish glow, or yellowish, greenish-yellowish.

Charlie: Okay, like—like chartreuse?

Sydnee: Chartreu—now... you're smarter about colors than me. What kind of green is chartreuse?

Charlie: So it's like a mix between yellow and green.

Sydnee: Yeah, sure. I think a chartreuse would be—

Charlie: It's around there.

Sydnee: Yes. That button on the board you're pointing to, I think that's about right. Yeah, yeah. So, um—so people liked that it glowed, and at the time people thought that glow was like, ooh, it's healthy. It's important. It glows.

Charlie: Oh.

Sydnee: So like you said, they put it in everything! They put it in toothpaste. They put it in cosmetics.

Charlie: Yeah. The put it in *water*.

Sydnee: They put it in water!

Charlie: Literally water!

Sydnee: What was that called? Do you know?

Charlie: I'm not sure.

Sydnee: Radithor!

Charlie: What?

Sydnee: That was a water you could buy that had radium in it. [laughs] It was a fake medicine. They used to sell all these kinds of fake medicines called patent medicines. So anyway... uh, it glows, and that can also be useful for making things glow in the dark. And as you mentioned, during World War I, starting in 1914, the thought was, "Well, it could be useful to have a watch that you could see in the dark, so what if we made the dials and the faces and the hands—what if we made it all glow?"

Charlie: Yeah, the numbers and...

Sydnee: And the numbers, mm-hmm. And so that was a useful place to start. The US Radium Corporation were the ones that first created this product. They worked to—they went out to Paradox Valley, Colorado and some parts of Utah, and they mined radium from something called carnotite ore. And they dug the radium out of the earth, and they mixed it with zinc sulfide. And it would come in, like, a powder, and then you had to, like, mix it with oil and stuff into a paint. Um, and they started marketing it as—you know what the name of this paint was?

Charlie: What?

Sydnee: Undark. Get it? [laughs]

Charlie: Not a very good name.

Sydnee: See, it's not dark, so it's Undark. It glows.

Charlie: Not a good name. [laughs]

Sydnee: You get it? And there would be other versions. There was another one that a company made using a similar formula called Luna.

Charlie: That—that's a way better name. [laughs]

Sydnee: And there was another one called Marvelite.

Charlie: That's another—that's a better name!

Sydnee: Than Undark? So the paint was there.

Charlie: Undark is the worst of those three.

Sydnee: It is—it is not a good name. Undark is not a good name. We knew what we needed to do with it. We had the little watches. We just needed to people to get to do the work, and as you said, it was fine detail work. They needed little hands, little delicate hands.

Charlie: Yes, delicate hands, and very, *very, very* teeny brushes. They were, like... just a smidgen big.

Sydnee: And as you said, the girls knew that they were being exposed to paint, because they glowed. Their dresses and their skin and their...

Charlie: Yeah. They would come home all glowy because their outfits and...

Sydnee: Mm-hmm.

Charlie: It just... really glowy.

Sydnee: And it was probably pretty.

Charlie: Yeah.

Sydnee: Imagine if they went out to, like, a restaurant or a bar later that evening and they're glowing.

Charlie: Ooh, yeah. If one of them had a dress on with, like, a belt, and then they painted the belt?

Sydnee: Mm-hmm?

Charlie: It would look really cool, like blue dress, purple dress, something like that. That would look really pretty.

Sydnee: Yeah. And they would like that.

Charlie: Yeah.

Sydnee: They would like that their dresses would get covered with that. Or, like you said, they might paint their nails or their teeth.

Charlie: Yeah.

Sydnee: Mm-hmm.

Charlie: They painted their faces, too.

Sydnee: Mm-hmm. And in addition to all of just—

Charlie: Oh, by the way, do not do that!

Sydnee: Yeah, that's a—you know—

Charlie: Do not do that at all!

Sydnee: That's a really good disclaimer. Don't do this with radiation of any kind. Yeah.

Charlie: Yes. Just any kind of radiation, do not do that. At all.

Sydnee: So, in addition to the fact that just working with the paint meant they got exposed to it, like you said, they were encouraged to use what was called the lip dip paint method. So you would... basically, the brushes—they were these camel hair brushes, and they needed to be a really fine point to do the little detailed work. And they might lose that point pretty quickly.

Charlie: Oh yeah, because—so you need to, like...

Sydnee: Mm-hmm. They called that pointing it with your mouth. You put it in your mouth to point it, and then you would dip it in the paint and paint with it, and then lip it again, put it on your lips to point it, dip it, paint it.

Charlie: Why didn't they just *wash* it? Before they did the... lippy thing?

Sydnee: That is a great question. Do you know why they didn't just use washcloths or water or whatever?

Charlie: Why?

Sydnee: 'Cause that would've cost money. It was cheaper just to have 'em stick it in their mouth. I know. The hard realities. And the girls didn't know. Like you said, they were constantly being reassured: the paint is totally safe. There's nothing to worry about. It's fine that you're sticking this paintbrush in your mouth. It's fine that you're painting your teeth with it.

Charlie: [simultaneously] It is—it is not—it is not.

Sydnee: Well, that—but that's what they were told, right?

Charlie: Not fine at all! [laughs]

Sydnee: Like, the women employed did not know what was happening.

Charlie: Yeah, at all.

Sydnee: Now, let me tell you what radium is doing to people who are exposed to it. You know how we need calcium?

Charlie: Yeah?

Sydnee: For our bones and teeth?

Charlie: Yeah.

Sydnee: Well, your body can confuse radium and calcium. It will put radium in the places where it puts calcium, so it will become part of your bones.

Charlie: And that makes you sick?

Sydnee: And part of your teeth. Yes, and it can make you sick. Except that when it gets in there, it will actually destroy the stuff around it.

Charlie: Ooh.

Sydnee: So in your bones—

Charlie: Eee, not good. Not good at all. Not good. [laughs]

Sydnee: No. In the middle of your bones, you have bone marrow, and your bone marrow makes all your blood cells, and it would destroy all that. And that can cause—and it can cause things to grow abnormally, which can lead to cancer, so...

Charlie: Yeah.

Sydnee: And—and like I said, that thing called anemia, where you don't have any blood cells. And it can cause the blood supply to bones to be destroyed, which just damages the bone. Like, the bone basically can die.

Charlie: What?!

Sydnee: Yes.

Charlie: Your bones can *die*?

Sydnee: Yes. So, this was bad, right? Like, you can see where this is going.

Charlie: Can, I, um, keep going with the bad part?

Sydnee: You want to tell the part that got bad? Okay.

Charlie: Okay, so—

Sydnee: Well, wait. Before you tell us the bad part... Daddy hates when I do this.

Charlie: Yes.

Sydnee: We gotta go to the billing department. [whispering] Say "Let's go."

Charlie: Let's go!

[ad break]

[music and ad end]

Sydnee: Okay, Charlie, we're done.

Charlie: Back!

Sydnee: Tell us—tell us the bad part.

Charlie: Okay. So, the women started to come home really, really, *really* sick.

Sydnee: Mm-hmm.

Charlie: They started to notice that. And then they had a way, way deadlier name: the radium girls. That's how this whole story got its name.

Sydnee: That's right. They did start to get sick. The first people who noticed were their dentists.

Charlie: Yeah. Because dentists—because the teeth were falling out and just... horrible. Blegh.

Sydnee: So they started going in, and they had toothaches, and their teeth were coming out. They had to have some of them pulled.

Charlie: Yeah. They might have to have dentures.

Sydnee: Mm-hmm. And nothing was healing well, either. They had sores, and it was bad. They had ulcers. So the first people who noticed—they were like, "Oh, the dentists are noticing." And then there was one woman in particular, Mollie Maggia, who was one of the first to suffer really severe illness. First, she started with the teeth issues, and then that seemed to spread to her jaw.

Charlie: Oh.

Sydnee: And the bone that makes up her jaw started to necrose, which is like it was dying.

Charlie: [gasps]

Sydnee: And eventually her jaw had to be removed.

Charlie: [gasps loudly] Oh, my!

Sydnee: Mm-hmm, yes. So obviously something was very wrong. But nobody wanted to admit that something was really wrong. So after she had died, they just blamed it on another illness.

Charlie: What?

Sydnee: They blamed it on something called syphilis.

Charlie: What?

Sydnee: We've done a whole episode on syphilis.

Charlie: Okay. [through laughter] I'll have to watch that episode.

Sydnee: We'll discuss syphilis later. So they blamed it all on something else. Basically because—well, a couple reasons.

Charlie: [sounding it out] Syphilis. Syphilis.

Sydnee: Yes. [laughs] Which is an illness that people used to get all the time.

Charlie: Oh.

Sydnee: But they didn't—and they still get it, but not quite as much.

Charlie: Like colds?

Sydnee: You know, for a while, yeah, basically.

Charlie: Oh, cool.

Sydnee: We'll get into this later.

Charlie: Okay. [laughs quietly]

Sydnee: So as the other girls got sick with similar stuff, right? Like, it wasn't just Mollie. Other girls are getting sick too, and the company is saying, "Well, it's not the paint! Definitely not the paint."

Charlie: "Definitely not the paint! Don't look here!"

Sydnee: "Nope, don't worry." And you know what the company said? They were like, “Look. To prove it's not the paint, we're gonna get these people, these researchers, to come in, do an independent study.” And independent means, “We're not doing it.”

Charlie: I know.

Sydnee: *They're* gonna do it, right? So you can trust 'em. So they're gonna come in, they're gonna look at all this, and they're gonna tell us if it's the paint. And they came in and they looked at all this, and you know what they said?

Charlie: It's the paint.

Sydnee: It's the paint. [laughs] They said yes, no, it is the paint! It's the paint! It's—this is radiation-induced illness.

Charlie: Guilty as charged.

Sydnee: They're sick because of exposure to the paint. And the company said, "[wavering] Are you sure? I don't think so. Let's get some other people in there."

So then they paid some other experts to come in and say it wasn't the paint.

Charlie: What?

Sydnee: So messed up, right?

Charlie: That is so messed up! And I bet they paid 'em to say that. I paid they paid them.

Sydnee: I bet you're right.

Charlie: I'm betting you it.

Sydnee: So, uh—so all these poor women are sick, and they can't prove that it was the paint that did it. So at that point, they turned to the legal system.

Charlie: Ooh.

Sydnee: Yes. They demanded that the company admit that it was the paint, and pay for, you know, all the medical care they were needing, and their suffering. They were really sick!

Charlie: Yeah. Yeah, all the medicines, and stuff.

Sydnee: Mm-hmm, and surgeries and things like that.

Charlie: Yeah.

Sydnee: But it took years to make anything happen. The number one reason at first was that no lawyer wanted to help them.

Charlie: Why?

Sydnee: Uh, they felt like it wasn't worth it, that there was no way they'd win, the company was too powerful. It would be too hard to prove.

Charlie: Okay, those were bad lawyers.

Sydnee: Also, these were—

Charlie: Those were bad lawyers. [laughs]

Sydnee: These were all women, young women and girls, and they didn't have a—

Charlie: Were not treated good back then.

Sydnee: No.

Charlie: Not at all.

Sydnee: Back then you didn't have a lot of power.

Charlie: Yeah.

Sydnee: Um, and so it took a while to find a lawyer who would work with them, and even then, it took—it was a long—it was 1928 when they first appeared in court, January of 1928.

Charlie: Good.

Sydnee: So quite a while after people were getting sick.

Charlie: Well, I mean, at least they appeared in court.

Sydnee: The girls who would be known as—who would go down in history, as you said, as the radium girls, were Grace Fryer, Edna Hussman, Katherine Schaub, and two sisters, Quinta McDonald and Albina Larice. And they were called the radium girls. By the time they got to actually go to court, two of them were already bedridden, and they were all so sick that—when you go to testify in court, do you know that they make you raise your hand and swear to tell the truth?

Have you seen that in movies and stuff? "I swear to tell the truth, the whole truth, and nothing but the truth, so help me God."

Charlie: Yeah.

Sydnee: They were so sick they couldn't even raise their hand to do it. So... right? I know. It's so unfair.

Charlie: Wait, why didn't they just say, "Well, that proves the point," then and there?

Sydnee: Well... man. We need baby sis here to answer these lawyer questions, don't we, huh?

Charlie: [laughs] Yeah.

Sydnee: Or uncle Michael. Uh, it's never that easy when it comes to the legal system. You can't just say, "This is the truth." Both sides get to argue, and they both get to present all of their facts to try to prove that they're right and the other person's wrong. Even if it's really clear who's right and who's wrong, both sides get to present that. That's how the justice system works.

Charlie: Didn't the husbands help them?

Sydnee: Well, I don't know if they had husbands. Some of them might've.

Charlie: Like, the one—if the ones who did have husbands, wouldn't they help them?

Sydnee: I mean, you like to think they did.

Charlie: Hopefully.

Sydnee: And I can—if you're making the point, which I think is fair to say, that men had more power generally in society than women did at the time, that's possible. But—

Charlie: Horrible.

Sydnee: —but these women were also... like, the company was working really hard to make sure that in the media, in the newspapers, these women were being seen as liars. So sometimes there's something called a smear campaign, when you want to make somebody look really bad, so that you win. They were kind of doing that. So it was really hard. I mean, maybe these women—the women's own families didn't believe 'em. It's hard to say.

Charlie: Oh!

Sydnee: I'm not—I don't know. I don't know.

Charlie: Hopefully not.

Sydnee: Then, as now, it can be tough to be a girl.

Charlie: Yep.

Sydnee: So, even as all this was happening—so they're in court. It's in the newspapers. Everybody knows about this, right? That this paint may or may not have done this stuff, and it's all gonna be up to a judge.

So, I mentioned to you that there were still women in other places?

Charlie: Yeah?

Sydnee: There were other factories who were doing this? [quietly] They didn't know.

Charlie: Oh no! Oh no!

Sydnee: As this was going on, these other women were still unaware.

Charlie: [singing] Oh no, no, no, no, no.

Sydnee: And so they were still doing the lip dip.

Charlie: Lip dip, lip dip, lip dip, lip dip.

Sydnee: The lip dip paint method. And even as the people who owned that company, called the Radium Dial Company, they *knew* about this court case! They knew about all this! They didn't tell these employees.

Charlie: What?!

Sydnee: They didn't tell 'em. At one point—

Charlie: What the what? That is not fair.

Sydnee: Now, at one point they did start to get worried that their—the girls and women who worked for them would get sick too. And they didn't want to get sued, so they switched from the brushes to these sort of, um, glass pens that you could use.

Charlie: Yeah?

Sydnee: Instead of the brushes. And then that way you didn't have to dip it, 'cause you didn't have to point it, right? If it wasn't a bunch of a fibers, if it's just a tip, then you can just dip it in the paint and keep painting, so you don't need to stick it in your mouth.

Charlie: Oh, good.

Sydnee: So they gave everybody these glass pens to use instead, but here was the problem. The way that you got paid by then was by how many you did during your shift. So you'd show up at whatever time in the morning, you'd stay until whatever time in the evening, and the number of watches you got done in that time period was how much you got paid. You got paid about a penny and a half a watch. Not a lot.

Charlie: Yeah, so...

Sydnee: Very low wages.

Charlie: So you would most—so at the most you would make about a dollar.

Sydnee: Probably. If they were really efficient, they could make two, two and a half dollars, even.

Charlie: Yeah. That's... that's, like, the most anybody could make.

Sydnee: But the problem is, it took longer to work with the glass pen than it did with the brush.

Charlie: Mm-hmm.

Sydnee: So do you know what they did?

Charlie: What?

Sydnee: They voluntarily went back to using the brushes so that they could keep making money, 'cause they needed to make money so that they could, you know, eat.

Charlie: But either way, it's bad! Either way, it's bad! [exasperated] Why?!

Sydnee: They still didn't—'cause they still didn't know!

Charlie: Ugh.

Sydnee: I know, I know. So anyway, finally in 1928, the radium girls would win their case in New Jersey. In Illinois, eventually they found out about this. The women who worked there also sued. It would be 1939, so 11 years later, before their suit would finally settle, or they would finally win, and they would be compensated.

Charlie: 11 years!

Sydnee: Mm-hmm.

Charlie: That's older than me! I'm 7!

Sydnee: I know. It took that long in court battles.

Charlie: That is so crazy!

Sydnee: Mm-hmm. And especially, like you said, when it was so obvious that they were doing the wrong thing.

Charlie: So-o-o-o-o-o obvious.

Sydnee: Mm-hmm. To this day, we don't—we'll never know exactly how many people got sick and how many people died of radiation exposure, because the thing with radiation exposure is... it doesn't always immediately hurt you. Some things, like cancer, or that thing that Marie Curie got, aplastic anemia, those can take a really long time to develop. And so you don't know how you sick you got from it until later. And that makes it really hard to figure out, you know...

Charlie: How many?

Sydnee: ... how many people got sick.

Charlie: Ooh.

Sydnee: So we don't know exactly. We know—

Charlie: I'm guessing about... hmm, 50-something, probably.

Sydnee: There were over 50 people that got sick, we know of. There were over a dozen people who died that we know of, but that's an underestimate. There were definitely a lot more than that.

Charlie: Ooh, yeah.

Sydnee: Yeah.

Charlie: A *lot* more. Tons more.

Sydnee: In your video, did they tell you what we learned from this?

Charlie: Do not eat radium. [laughs]

Sydnee: [laughs] Well, that is an important lesson.

Charlie: [laughs]

Sydnee: Do not eat radium. You know, somebody asked me that question on an episode we did a few weeks back. If you can eat a radioactive rock.

Charlie: Can you?

Sydnee: No.

Charlie: [laughs]

Sydnee: My answer was no. Do not eat the radioactive rock.

Charlie: Do not eat radioactive anything.

Sydnee: That is true. Don't eat anything radioactive.

Charlie: Except, like, if it's... radioactive flavored candy? Like those really, really sour candies?

Sydnee: That aren't really radioactive, they're just...

Charlie: Yeah, they're just, like, toxic...

Sydnee: Oh, okay.

Charlie: What are they called?

Sydnee: I know what you're talking about. They look like they're in a barrel of...

Charlie: Yeah.

Sydnee: Nuclear waste? [laughs quietly]

Charlie: Yeah.

Sydnee: Candy's weird sometimes, isn't it?

Charlie: Yeah! [laughs] Really, really weird.

Sydnee: And that's not real radiation, we should say. That's just candy. Candy that is made to look like it?

Charlie: Strange.

Sydnee: Do kids like to eat things that look like toxic things you're not supposed to eat?

Charlie: No. [laughs]

Sydnee: It's very strange.

Charlie: Unless they're, like, five or younger.

Sydnee: Oh, okay. Then they do?

Charlie: Well, if it's Cooper.

Sydnee: She'll eat anything, won't she?

Charlie: Yeah. [laughs] She has a death wish.

Sydnee: [laughs] I think—I think she just has no fear.

Charlie: Oh. Yeah. That too.

Sydnee: Yeah. Uh, so first of all, as you said, we understood after that that radium was dangerous.

Charlie: Very dangerous.

Sydnee: Um, this was—actually, they worked with one of the women who worked and painted to watches to have her breathe out, and they measured levels of radiation as she was breathing. And they, from these different studies, they established what we call the safe limits for occupational standards. So, like, if you work in a hospital, we have x-ray machines, right?

Charlie: Yeah, like you.

Sydnee: Yeah, like I do. So people who work down in the radiology area who do all the imaging get exposed to radiation. So we know what the safe levels—like, you can get exposed to a little bit throughout your life and it's okay. And so we have now standards set for how much you're allowed to be exposed to in a workplace, and things like that. You know that? And they have special vests they have people wear with lead in them to protect them from radiation.

Charlie: Oh, cool!

Sydnee: Anytime somebody comes in a room to do an x-ray, I usually run out the door.

Charlie: Wait, like lead from pens?

Sydnee: Yeah, like that.

Charlie: Like pen lead?

Sydnee: Lead, which can block areas of the body from radiation.

Charlie: L-E-D? Okay, got it.

Sydnee: Yeah, L-E-A-D.

Charlie: Why is it spelled like that?

Sydnee: Why is anything spelled like it is?

Charlie: Yeah. English is weird. [laughs]

Sydnee: That's what we tell you. Anytime you ask why are certain words spelled some ways, don't we?

Charlie: English is weird.

Sydnee: So this was a big turning point for our understanding about radiation and radium. And this was also a big turning point for workers' rights, because we shouldn't force people to work in dangerous situations just to make enough money to eat, right?

Charlie: Yeah!

Sydnee: Like, we deserve safe workplaces, don't we?

Charlie: Yeah, and now luckily there are safe workplaces. Hopefully.

Sydnee: Eh, they're better than they were, generally. Most. Not all.

Charlie: Well, better than they were. Not great, but better than they were.

Sydnee: And there's still a lot of issues with that. But that's why it's really important to always allow workers to band together and form unions and fight for their rights, yeah. We'll talk about that more some other time.

Charlie: Okay.

Sydnee: Um, so radium would finally fall out of popularity.

Charlie: Yeah.

Sydnee: Because like you had said earlier, it was in toothpaste and everything.

Charlie: Yeah, it was even in water! Water, guys. Literally water!

Sydnee: One case that really—at the same time that all this was happening, there was a famous golfer.

Charlie: Who?

Sydnee: Named Eben Byers.

Charlie: What?

Sydnee: He was—he played golf.

Charlie: What?

Sydnee: You know, the sport golf.

Charlie: Oh yeah, golf.

Sydnee: Golf. It's that thing that Pop falls asleep watching sometimes.

Charlie: [laughs]

Sydnee: You know?

Charlie: Oh, Pop's my grandpa, by the way.

Sydnee: [laughs] Uh, so there was this guy named Eben Byers who was a famous golfer, and he hurt his arm, and his doctor prescribed him Radithor. Which was water with...

Charlie: Radium.

Sydnee: And so he thought it really was helpful, so he took tons. Tons and tons and tons. Drank bottle after bottle of radium. And then his jaw fell off in 1931.

Charlie: [gasps]

Sydnee: Yes.

Charlie: Why do people—why is it always the jaws?

Sydnee: It was getting directly exposed, because the—that's—

Charlie: Around the—

Sydnee: Mm-hmm.

Charlie: Like, from here to here.

Sydnee: Yeah. That was the site of first exposure, right? Was the face.

Charlie: [simultaneously] Here. Here.

Sydnee: 'Cause you're just—you're drinking it, or putting it in your mouth.

Charlie: Mm-hmm.

Sydnee: Yeah.

Charlie: What if you put it up your nose?

Sydnee: Well, then your nose would fall off. Probably.

Charlie: Yeah, that makes sense.

Sydnee: Yeah. So anyway, that was—because he was like, you know, a sports person and everybody was paying attention when that happened, a lot of people were like, "Eesh! Stay away from radium!"

And so now we try to limit radiation. We only use it for very specific things, and we have a lot of control over the doses we use now. Like an x-ray, like for instance if we are worried that you broke your arm and we want to x-ray your arm.

Charlie: Yeah.

Sydnee: The amount of radiation you get from that is very, very tiny.

Charlie: Yeah, just like a [high pitched] smidgen.

Sydnee: Mm-hmm. Now, there are some that are more, like if you get a CAT scan.

Charlie: Yeah.

Sydnee: That's more radiation. And then certainly we—

Charlie: It's *more* radiation, but not enough to make you, like, really, really sick.

Sydnee: Right.

Charlie: That makes something fall off.

Sydnee: And we do—we watch those things in workplaces, and we also do still use radiation as a treatment for some...

Charlie: Cancer.

Sydnee: That's right. So that use that we found all those years ago is still valid.

Charlie: But...

Sydnee: But it's very specific. For just certain things in certain places.

Charlie: Yes, not too much, not too little.

Sydnee: Exactly.

Charlie: Just... right.

Sydnee: Well, Charlie, do you have any more questions before we go here? I think we're about out of time. Any more questions about the radium girls? [pause] You don't have to have any questions.

Charlie: I—I actually have two more—one more question. What is my name?

Sydnee: [laughs quietly]

Charlie: [laughs] Okay, I'm just joking.

Sydnee: You're being silly.

Charlie: I'm done.

Sydnee: Hey, can I say something, though?

Charlie: Yeah.

Sydnee: Thank you!

Charlie: You're welcome!

Sydnee: This was, no joke, Charlie's idea.

Charlie: Yeah. This was literally my idea. I was the one who showed her the video, even. [laughs]

Sydnee: Charlie watches, on her own, of her own choosing, very educational YouTube videos.

Charlie: Yeah!

Sydnee: That teach her about all kinds of things, from history and science and the animal world, and all kinds of topics. And this—

Charlie: I watched a Guinness World Records one time. There was a, um... fastest toilet on wheels.

Sydnee: [wheeze-laughs]

Charlie: It was...

Sydnee: [laughs] What—where is the fastest toilet on wheels? Who won?

Charlie: I don't remember.

Sydnee: [laughs] I didn't know that was a thing! Oh, Charlie. But you did, you watch these great videos, and Charlie brought this video about the radium girls and said, "I think this would make a good topic for *Sawbones*," and I said, "You are right." And Charlie researched this episode. I just helped.

Charlie: Yeah.

Sydnee: But, uh, thank you. I think—

Charlie: She helped me research it a bit. She was the one who researched her parts.

Sydnee: Mm-hmm.

Charlie: I was the one who researched my parts, by watching that video over and over and over again.

Sydnee: But I'm really proud of you. You did a great job!

Charlie: Thank you!

Sydnee: And you can—you can take over the podcast someday, when Mommy retires from podcasting.

Charlie: Okay, thank you. [close to the mic] Let me—let me have it. Give it to me!

Sydnee: Oh, you're ready? [laughs]

Charlie: [through laughter] Give it to me now! Okay, I'm not ready yet. I already have my own.

Sydnee: You're not ready?

Charlie: I already have my own with Daddy.

Sydnee: Oh! [laughs heartily] I love you so much. Thank you, Charlie. Uh, thank you all for listening. You should check out Maximum Fun.

Charlie: Yeah.

Sydnee: Right?

Charlie: Yeah.

Sydnee: Yeah?

Charlie: Yeah? [laughs]

Sydnee: 'Cause it's a great—that's our podcast network.

Charlie: I said "yeah" too much.

Sydnee: And we love 'em. And thank you for listening to *Sawbones*. Daddy usually does the intros and outros, so I'm struggling a little here. Thank you...

Charlie: For...

Sydnee: ... to The Taxpayers.

Charlie: Yeah, thank you to the—

Sydnee: For our song, "Medicines."

Charlie: —Taxpayers, yeah.

Sydnee: Mm-hmm, which is the intro and outro of our program.

Charlie: Yeah. And, um, thanks for listening to *Sawbones*!

Sydnee: And—

Charlie: Once again, this was me, Charlie McElroy, and my mom, Sydnee McElroy, so... bye, guys!

Sydnee: And don't forget, don't...

Charlie: Drill a hole in your head.

[theme music plays]

[chord]

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