Sawbones 498: Hydrogen Water

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

[theme music plays]

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

Sydnee: And I'm Sydnee McElroy.

Justin: I am really hoping you didn't clock the moment where I stared up into the heavens, trying to recall what podcast I was recording, and how I started that podcast.

Sydnee: Hey, J-man, I'm used to that.

Justin: Yeah.

Sydnee: Yeah.

Justin: I just gotta get— It's like the loading, like a…

Sydnee: [chuckles]

Justin: I feel like a jukebox gettin' the— To make myself super relevant. Gettin' the vinyl out of the slot—

Sydnee: And pullin' it out and turn it.

Justin: — and watchin' it pullin' it out, and play it and start it.

Sydnee: Mm-hmm.

Justin: Yeah.

Sydnee: You know, kids. You know how the jukebox—

Justin: You know, kids.

Sydnee: — picks up the vinyl.

Justin: You know, it picks up the CDs and— That's not—

Sydnee: Or the CDs. None of that.

Justin: You know how it pulls out— They should have one that's full of Napsters. Where you just reach in there and it takes out a Spotify or a Napster or a Limewire, 'cause and it plugs it in for you to listen to.

Sydnee: And you just listed all of the eras are just mixing there.

Justin: Nobody expects… a museum to be modern, right?

Sydnee: Mm-hmm.

Justin: I'm fully inhabiting the fact that I'm a 43-year-old man. I'm not embar—

Sydnee: So you're a museum?

Justin: What? I'm a museum.

Sydnee: Are you— You're a museum.

Justin: I'm not embarrassed at the fact that I'm irrelevant, I'm a font of information.

Sydnee: I—

Justin: I'm historically relevant.

Sydnee: Can I will make— I would back up that I think that— [chuckles]

Justin: It's a seq— This is a cultural treasure. Outdated references are a cultural treasure I'm passing down.

Sydnee: No.

Justin: You know what I mean?

Sydnee: And I— Well, but I think specifically when it comes to like technology as it relates to like music and media and device technology, I would say you're kind of a museum.

Justin: Mm.

Sydnee: And I do— But you're like uniquely poised. We're of that right generation where we experienced all of it very quickly through our most formative years.

Justin: You— We ordered a VHS tape recorder, like a VCR—

Sydnee: Like a camcorder.

Justin: V— I guess camcorder, to use as a prop in *Charlie and the Chocolate Factory*, the show we're doin' this summer, and both Sydnee and I when we opened it were like, "What?! Everybody look! Kids, get in here!"

Sydnee: It's just beautiful.

Justin: "There it is!"

Sydnee: It's just I can see it propped up on my dad's shoulder at every Christmas and beach vacation.

Justin: I think so many 80s families had that moment where the— one of the parents brought home the VHS camcorder and the whole family's freakin' out, and Sydnee and I were trying to reenact it, and our kids are like, "What could that do? What could it be for?"

Sydnee: [chuckles]

Justin: "What could it do?"

Sydnee: And it— I'm sure that if you're of this age, you have those tapes that's just like probably your dad, it doesn't have to be your dad, but probably a dad. A dad figure.

Justin: A dad type.

Sydnee: A dad type.

Justin: A dad type.

Sydnee: The dad— A dad type, holding it and just looking at like the beach or like the room or whatever. Like there's no-one there, and just narrating.

Justin: Yeah.

Sydnee: Talking about it. Anyway, that's not—

Justin: How does that— Now, Syd—

Sydnee: That doesn't relate to anything we're talking about.

Justin: — I love the intro that you scripted for us.

Sydnee: [laughs]

Justin: The question is, why— [chuckles] How does it relate to your topic?

Sydnee: Well.

Justin: I'm really confused.

Sydnee: I wanna make— I'm gonna talk about our main topic. I wanna make a quick mention of something else that we got a lot of emails about.

Justin: Okay, you're pinching at me. I'm worried.

Sydnee: I am pinch— I'm motioning at you.

Justin: Like a little crab recording over here.

Sydnee: I wanna tell you about this.

Justin: Alright.

Sydnee: But we got a lot of emails. I wanted to do— [chuckles] I almost did like a— Sometimes I'm researching one episode, and then something happens in the news and I'm like, "Okay, well never mind, that's the— We'll put this one for next week. This is this week."

Justin: Right.

Sydnee: And the art— All the articles came out about the worm in RFK Jr's brain.

Justin: Uh-huh.

Sydnee: The dead worm that ate part of his brain. Have you heard this?

Justin: Yeah no, you— From you, honey. From you, the person I know in my life—

Sydnee: [chuckles]

Justin: — that is very obsessed with the worm in RFK Jr's brain. [giggles]

Sydnee: I am not, let me tell you, I am not the only person who's thinking about this a lot.

Justin: That's fine, you're the only person in my life.

Sydnee: RFK Jr, who's running for president, said that there was— I guess there was a time where in court he said he couldn't earn enough money to pay child support, because a worm crawled in his brain and ate part of it and died, and so he has some cognitive deficits as a result.

Justin: [sighs]

Sydnee: And this just was released. You know, stuff comes out on the campaign trail.

Justin: Sure, yeah. You run out of conversation topics.

Sydnee: Anyway, I'm not doing a whole episode on this right now because I don't know the nature of the worm that ate part of his brain. I've read a lot of articles from a lot of doctors who are like hypothesizing. I'm waiting for more info.

Justin: Okay, so we're waiting to get more of a complete picture.

Sydnee: I would like to know exactly the nature— I have— I mean I could guess. I could guess, and a lot of these doctors have guessed, and they're probably right. They're probably right, but we don't know.

Justin: But yes, you don't wanna do that without— And you gotta make a worm chair.

Sydnee: So, I just wanna let you know.

Justin: No, you know—

Sydnee: I am aware of the dead worm.

Justin: Okay.

Sydnee: I am looking into it. If I find credible data as to exactly what did eat part, or pro— I mean it didn't. Like that didn't happen. That's not exactly what happened. But I will let you know. So this will not be about the worm.

Justin: Okay.

Sydnee: But it is about another current… medical topic.

Justin: Mm.

Sydnee: Well, it's current for me.

Justin: Okay.

Sydnee: And it's curr— I think it's current in this country, but maybe a little older outside of the US, okay?

Justin: Okay.

Sydnee: I got a TikTok surfaced to me, and I will say that this is as a result of the research I do for this podcast.

Justin: [snorts]

Sydnee: I cannot imagine [chuckles] that this TikTok would be surfaced to me based on what I seek out for my own enjoyment and edification, but for you, my listeners, this is the sort of stuff I seek out.

Justin: Sydnee's algorithm is in shambles, folks.

Sydnee: Mm-hmm.

Justin: Everybody knows it.

Sydnee: So there was a lady on TikTok telling me that her water that she bought has hydrogen in it, and it— that's why it's better than my water.

Justin: Okay.

Sydnee: And I've gotta buy hydrogen water, 'cause it's got hydrogen.

Justin: Okay.

Sydnee: And as you can imagine, because I watched this TikTok, and this is how the— things work on the algorithm, right? You watch one, and so then you got all the people who are like dueting or—

Justin: Right, you're—

Sydnee: — stitching.

Justin: — chiming in, right.

Sydnee: Right. And like, and they were already doing the thing that I was doing as I watched it. Saying like, "Water has hydro— Water ha—"

Justin: Water has it.

Sydnee: "It— It has— It is mostly, it is hydrogen." [laughs]

Justin: Right in there.

Sydnee: It's in there.

Justin: It's right in— When you told me, you— Me, a layman.

Sydnee: So, I wanna talk about—

Justin: — even knew.

Sydnee: — hydrogen water, because… when people are selling hydrogen water, I think that— And especially is you listen— If you just saw those TikToks, you would think like, "Oh my gosh, this is the snakiest of snake oils, right?"

Justin: Yeah.

Sydnee: Like what are you— Like.

Justin: Seemed a little— This seemed like light work for you. I was— It seemed like you'd be able to—

Sydnee: Right? It's like selling salt with sodium in it.

Justin: Yeah.

Sydnee: Right.

Justin: It almost feels like a dad joke.

Sydnee: Yes.

Justin: It feels like, "I don't have water, but I could make you some… couple particles of hydrogen mixed with oxygen," you know, I don't know.

Sydnee: Exactly. Exactly. Okay. I am not saying that it's not snake oil, but there is more to it. I had to look into it, to see like, are we really just

rebranding water as hydrogen water, or is there something else happening in this water that they can make this claim?

Justin: Mm.

Sydnee: That this is different than standard H_2O water. There is a difference, okay, and I think that the reason a lot of people had this reaction is we don't know the chemical formulas for a lot of things, like standardly, right?

Justin: Right.

Sydnee: Like unless you— unless that's your area of expertise.

Justin: Right.

Sydnee: Unless you studied chemistry, you don't know like… Do you know what Ch_3CoOH is?

Justin: Ch_3CoOH.

Sydnee: If you look at my notes then you're gonna know.

Justin: I'm not looking at your notes, I'm tryin'a think. Mm, no.

Sydnee: Okay, that's acetic acid.

Justin: Okay.

Sydnee: I know that because I have a minor in chemistry, and I know that that's basically vinegar, that's like the primary thing. That's what makes vinegar vinegar, right?

Justin: Okay.

Sydnee: It's not all that vinegar is, but that's like that, right?

Justin: Right.

Sydnee: So I see that and I think "vinegar."

Justin: Vinegar.

Sydnee: But a lot of people don't, but you probably know CO_2?

Justin: Carbon dioxide.

Sydnee: There you go, you probably know NaCl.

Justin: Sodium.

Sydnee: Yeah.

Justin: Well, that's table salt.

Sydnee: Well, it's not just sodi— Yes, sodium…

Justin: Dioxide. Chloroxide.

Sydnee: Chloride.

Justin: Chlorox—

Sydnee: Yeah, there you go. You—

Justin: Sodium chlorox.

Sydnee: If you say NaCl, you would know that was salt. Right?

Justin: Yeah.

Sydnee: You would know salt.

Justin: There's one that spells out "nacho." That's one in the—

Sydnee: [chuckles]

Justin: — [chuckles] ingredients in cheese. I don't know.

Sydnee: [chuckles] And you know H_2O.

Justin: Yeah.

Sydnee: As you've already referenced.

Justin: Yeah.

Sydnee: Okay. This isn't just H_2O water. They've got extra hydrogen in the water.

Justin: Sorry, it's— I just wanted to clarify. Sodium citrate is the chemical formula, and it's spelt— it's this. So that's the ingredient in the cheese that makes it melty and stuff.

Sydnee: Ahhhh.

Justin: But it's spells out "nacho."

Sydnee: I see.

Justin: It's crazy.

Sydnee: I see what it is there. Okay. That's makes more sense now. Okay. You got— there's numbers in there.

Justin: Uh, yeah, there's all kinds of numbers.

Sydnee: The numbers matter.

Justin: I assumed.

Sydnee: [giggles]

Justin: I'm not a smart man, Syd, but I didn't think people were just having some fun with numbers.

Sydnee: The numbers change things. A lot of the time.

Justin: Oh yeah, that is—

Sydnee: Like that— what it is.

Justin: You know, I've noticed that poppin' up in everything in the world.

Sydnee: In everything in the world. [chuckles] Every— When you change the numbers—

Justin: That's really oddly—

Sydnee: — it changes the thing.

Justin: Yeah.

Sydnee: And that's the thing about chemistry. [chuckles]

Justin: Yeah, that's— that has been a real firm one lately.

Sydnee: Okay, so how do they get extra hydrogen— how do you put extra hydrogen in the water? So the hy— So the water molecule is an oxygen with two hydrogens on it.

Justin: Okay.

Sydnee: Right?

Justin: Right.

Sydnee: You can see the little— It looks like a little… angle. You know what I mean?

Justin: Yes.

Sydnee: There's like an O and then you can see the little drawing.

Justin: Yeah.

Sydnee: Two Hs as sticks off of it.

Justin: No, I gotcha.

Sydnee: Okay. So here are the different ways— Can I tell you, I'm a— I've said this on the show before. I'm a biologist.

Justin: Mm-hmm.

Sydnee: That's my primary degree was biology.

Justin: Right.

Sydnee: I like the gooshy sciences. I like the sticky, gooey, ooey, yucky sciences.

Justin: These are too— A little too cold for you.

Sydnee: Yeah, when it— when I start getting into chemistry, it's hard. I did find I did well in chemistry, let me just clarify.

Justin: That's good.

Sydnee: I did well.

Justin: Great.

Sydnee: I earned my minor. I… It was harder. I had to work harder. Biology comes naturally. I like things that are gooshy. So I read about how they make the hydrogen water many times, to try to get it straight in my biology brain. So first of all, you can perform electrolysis on the water.

Justin: Okay.

Sydnee: Okay? Now this might start to sound familiar to you if you've all— if you've listened to our episode on alkaline water.

Justin: Oh.

Sydnee: We've talked about that before.

Justin: Uh-huh.

Sydnee: Or if you are familiar with that whole sort of culture of like special water with special properties that you could even make at home. 'Cause they sell things that you can use to make this stuff at home. So you can basically shoot an electric current through the water.

Justin: Okay.

Sydnee: And you separate the oxygen from the hydrogen.

Justin: Okay.

Sydnee: And then you've got extra H_2, little bonded hydrogen molecules.

Justin: Free floating.

Sydnee: Free floating.

Justin: You've broken the bonds.

Sydnee: Mm-hmm.

Justin: And so you've got extra floating around, okay.

Sydnee: You can also— This is a cool way. You can put magnesium sticks in the water.

Justin: Ooo.

Sydnee: And the magnesium combines with the H_2O, and what you end up with is $MgOH_2$, so magne— one magnesium, one oxygen, two hydrogen, and then an extra two hydrogens over on the side. You gotta get two H_2Os in there.

Justin: Okay.

Sydnee: You get what I'm say—

Justin: Yeah.

Sydnee: Anyway. Anyway, so you get this— You get these other molecules that leave you with excess hydrogen. Depending on [chuckles] what you're buying. If you're buying hydrogen water, they might use a different form. They will tout the ways that they've created it perhaps as like evidence that it's a better way to do it.

Justin: Mm-hmm.

Sydnee: You can also, as I mentioned, you can but machines called ionizers.

Justin: Oh, just like the—

Sydnee: To try to do this at home.

Justin: Kinda like the home alkaline— alkalon— alkalinizer, right?

Sydnee: It is—

Justin: I remember there bein' a box.

Sydnee: So, basically they're like— It's like the same process, to make alkaline water or make hydrogen water. You can use— You're using an electric charge—

Justin: Every time you say, "alkaline water," I think of alk— that movie you and I watched on YouTube.

Sydnee: Mm.

Justin: You remember?

Sydnee: Mm-hmm.

Justin: What was it? That was—

Sydnee: It was the super religious…

Justin: *Best Friends*—

Sydnee: — misogynist movie.

Justin: *Best Friends Regurgitated* or *Best Friends Recycled* or something like that. *Best Friend*— But it's about like a 60-year-old cat biker guy meeting this lady who shared his [chuckles] Libertarian [snorts] [wheezes] Libertarian mindset.

And there's this like romantic scene at a dinner, and the first thing they connect on is the guy's like, "Have you—" Or no, she says, "Have you ever tried alkaline water?" And he's like, "Yeah, I'm really into alkaline—" There's like a whole scene about how into alkaline water they are. [laughs]

Sydnee: But there's also a whole thing—

Justin: It's great.

Sydnee: That's it's important like that they're virgins or something? I don't know. I'm not a Libertarian, but Libertarians, you guys, you gotta clean up your yard there. [chuckles]

Justin: [wheezes] [laughs]

Sydnee: There's a lot of people in there. And I don't know that we're all of— that you're all of one mindset anymore. [laughs]

Justin: That's the problem with Libertarians, you know, you gotta— you can't— [chuckles] You gotta "I don't know! It's just right to be a dullard, I don't know!."

Sydnee: "I don't know."

Justin: Okay, moving on.

Sydnee: Anyway, I would not recommend— I'm glad we don't remember the name of that movie, 'cause I wouldn't recommend it.

Justin: Yeah, it's not worth you checking out, yeah.

Sydnee: Okay, so you can buy m— you can buy these ionizers and they do one of those two things, and I imagine they're marketed to do different things.

The plates that are used to charge the water are different. One of 'em will make extra hydrogen and one of 'em'll raise the pH, making them alkaline water. So there's electricity stuff happening. [chuckles]

Justin: Gotcha.

Sydnee: That— Oh man. See then we bridge over from—

Justin: This is like I'm watching a—

Sydnee: — the industry and the physics, and then just—

Justin: This is like watching a Technology Connections video, right in front of my eyes.

Sydnee: [chuckles]

Justin: Like you have a perfect grasp of the material. [chuckles]

Sydnee: I read [chuckles] the description of this process so many times. And then I was tellin' a friend about it and they were like, "Are you talking about like heavy water?" And I was like, "No, like that for you— Like for nuclear reactors? No, I'm not talking about that." But that's also— It's a different form of hydrogen.

Justin: Mm.

Sydnee: But that is hydrogen water.

Justin: This isn't—

Sydnee: It's just a different kind of hydrogen, 'cause that's the kind that you use to make like nuclear weapons, not the kind that you use to sell people—

Justin: Y'all.

Sydnee: — expensive water.

Justin: Y'all, we— You will walk out of *Sawbones* hopefully being a little bit smarter about biology and science and medicine.

Sydnee: [chuckles]

Justin: We never promised that you would leave this show any smarter about electricity and chemicals and all the things where Sydnee and I are both kind of like, "I don't know."

Listening to you talk about it, it makes me feel how… you must feel trying to listen to me trying to talk about a biology thing, except if I don't understand it any better than you. So I'm just kinda nodding along like, "Mm-hmm, the metal plates, absolutely. Reversed heavy water into it, break the bonds. Absolutely."

Sydnee: I am telling you, I— Man. It's just bringing back flashbacks of chemistry, and it's ooph. Okay, part of the problem with this whole thing is okay, you've used one of these methods to make the hydrogen water, okay?

Justin: Right.

Sydnee: So people who are selling you hydrogen water have done one of these things to it already, and then bottled it.

Justin: I mean one hopes, right.

Sydnee: Right?

Justin: One— One presumes.

Sydnee: So then they've bottled it, and they're selling it to you. Now how are they gonna bottle it? Well most water is sold in plastic bottles.

Justin: Bottles.

Sydnee: Perhaps glass, I guess, could be.

Justin: Would that messed up your ionization though?

Sydnee: Well, the problem is that hydrogen can disso— can like diffuse through these substances.

Justin: Mmm, so they can get out. All your precious hydrogen.

Sydnee: Yes, all your precious hydrogen can leave solution pretty quickly. And so once you've made hydrogen water, it won't necessarily stay hydrogen water very long.

Justin: It wants to go back to being regular water.

Sydnee: Well, or just diffuse through the walls of the container. The extra hydrogen just leaves the vessel.

Justin: But then doesn't that—

Sydnee: And then you've just got water.

Justin: Oh, yeah.

Sydnee: It doesn't—

Justin: I said go back to water.

Sydnee: Well those—

Justin: I didn't mean it was—

Sydnee: — those hydrogens are not rebonding with oxygen, they're leaving.

Justin: I know, I didn't mean they were— I didn't mean that the hydrogens were leaving the bottle to go find another water to be part of.

Sydnee: [chuckles]

Justin: They're gonna— It's not *Milo & Ottis*, [chuckles] the lo— It's not *The Incredible Journey*, it's just I'm saying the water goes back to being water.

Sydnee: Well, yes, the water goes back to being— I meant that the extra little hydrogens, the H_2s, don't like find oxygens to re— Like they're happy to be free of their oxygen shackles, and they—

Justin: Yeah.

Sydnee: — exit the bottle.

Justin: Got it.

Sydnee: Okay. So the— So this begs the question, how much—

Justin: Begs a lot of questions this one, Syd. [wheezes]

Sydnee: How much hydrogen is in the hydrogen water that you're buying? Like if you're buying a bottle of hydrogen water, it was made at some point in time. And then bottled, and then shipped, and then put on that shelf. And then at some point you bought it.

Justin: Yeah.

Sydnee: In that period of time, did all that extra hydrogen leave the bottle, and are you just buying really expensive bottled water?

Justin: I mean, I don't know, but I'm hoping you're gonna tell me.

Sydnee: No-one knows.

Justin: No-one knows.

Sydnee: Nobody is checking the quality of that.

Justin: Okay.

Sydnee: Becau— It's just— It's just water. So this is sort of the problem with hydrogen water. Now, I wanna get into like, okay. In the US it seems to have become popular pretty recently. I think that it's following off of the alkaline water trend, right?

Justin: Right.

Sydnee: Like I feel like that's been— And again, I'm only speaking from the US perspective right now with this, 'cause this is where I've lived—

Justin: Right.

Sydnee: — for the last 41 years, and so I have watched this happen in real time. We went from drinking water… Which that was a big advancement. I feel like when we were kids, nobody drank water.

Justin: That's true. It's kinda like— No yeah, it was fair.

Sydnee: We all drank juice boxes.

Justin: Yeah, for sure.

Sydnee: Right? And our parents drank diet, right.

Justin: [snorts] Yeah.

Sydnee: Or RC Cola.

Justin: Or RC Cola.

Sydnee: And then we drank juice, and then at some point they were like, "Kids are drinking too much juice, give 'em water," and then we all drank water all of a sudden. And at first it was just water, and then there were filters for water, ooo.

Justin: Nice.

Sydnee: And then there was bottled water. Very fancy.

Justin: Yeah.

Sydnee: And then now this was the next evolution of water is all of a sudden we got like alkaline waters, and now hydrogen waters. So it's just like water technology— It's just better waters, more expensive waters to sell people.

Justin: Hamp— There's Hampton Water. Jon Bon Jovi's Hampton Water.

Sydnee: There—

Justin: That's a wine brand that he makes with his son.

Sydnee: It's interesting because I feel like you have these two competing tracks that water has gone down. You have like the very natural like spring water sort of thing, like, "We sourced this water from a glacier somewhere, and now we've brought it straight to you."

And then you've got this sort of water, which is like, "We bio-hacked it, we made it better. This— Like Earth gave you a water that was fine, but humans gave you a superior water."

Justin: Right, "We have fixed water."

Sydnee: "We made water…"

Justin: Yeah.

Sydnee: "Ultra water."

Justin: Yeah.

Sydnee: Anyway. So— [chuckles]

Justin: It's also this annoying thing of like the corporations made water better than the government makes water.

Sydnee: Mm-hmm.

Justin: The people— Peop— This is better than the incredible… like free, clean, public water source. It's better than that, but not free.

Sydnee: That comes through most of our taps, yes.

Justin: Yeah, but a lot more accessible. Yeah.

Sydnee: Yes. So anyway, this is newer I think here, but this specifically, hydrogen water, actually has a much longer history in Japan, where it has been popular for quite a while.

And so I wanna talk about like sort of that history as like why I think it has taken root, and its popularity has been cemented here. But before I do that, we gotta go to the Billing Department.

Justin: Let's go.

[transition theme music plays]

[ad break]

Justin: So Syd, how did this get a foothold in… Japan?

Sydnee: So it's interesting, it sounds like there was a lot of research being done, and I mean this is since like the early 1900s, on hydrogen.

Justin: Mm-hmm.

Sydnee: Hydrogen was a big area of focus, not just for like water, but for energy.

Justin: Right. Yes, exactly. I— That's obviously a big— splitting the atoms of the hydrogen is how you make the bombs, and you're gonna get energy out of it too.

Sydnee: So the—

Justin: Now Syd, could you give everybody a quick primer on sort of like hydrogen fusion for energy purposes, and like how that all works.

Sydnee: Nope.

Justin: 'Kay.

Sydnee: [chuckles] I— [chuckles]

Justin: [giggles]

Sydnee: I believe that— [chuckles] Moving on. I think that even—

Justin: [snorts]

Sydnee: As I was trying to read articles about specifically the history of hydrogen water in Japan, which like you can read little— A lot of the excerpts about that come from the different companies that sell hydrogen water, so it gets difficult to like trace the actual history of like there was

research being done. To this day, I think it's a big area of like focus of research in Japan.

Justin: Mm.

Sydnee: Is hydrogen used for various applications, one of them being healthy water. Healthier water, I should say. Water is— should be healthy. Healthier water.

So back in the early 1900s, they started this sort of research on hydrogen and what its possibilities are, and that— and they made like the first electrolyzed water in like the 30s. They were making ionizers that you could use at home to do things to your water.

And some of this— It kinda gets mixed up, because as you're looking at the history of hydrogen water, it's really easy to accidentally start reading about alkaline water, and then read about water that is both alkaline but then had hydrogen?

That's not possible, that doesn't make sense. Because we're goin' acidic versus— You— We're going in different directions with the pH.

Justin: Got it, yeah.

Sydnee: And so— But you will find this all kinda mixed together. I think the idea is "we can do stuff to water" isn't that exciting, and then—

Justin: Let's do it. Let's do all this stuff.

Sydnee: And then the water— And if you change— My understanding is, and I've never drank hydrogen water, is that it tastes slightly different, and so you could tell a difference. And I think we are kind of predisposed, as humans, that if something has a stronger taste to it, we think it's doing something to us.

Justin: Yes, that's well-established in this show I think.

Sydnee: Yes, and they started making these ionizers back in the 30s, and by the 50s, they were kind of popular to try to like access or by some of this water, or have it in your own home even, for all of its healing effects. Like this is— this water we've maximized—

Justin: You gotta have it on hand, yeah.

Sydnee: — to not just to drink but also like bathe in, it was very popular to bathe in these waters for the like all-around healing effects. It was called shin nooru solution, or synnohl liquid, which is—

You'll still see these terms used for the— for when it's sold from the different companies who sell it in Japan. They were basically brought to the Japanese Ministry of Health at the time.

Justin: Mm-hmm.

Sydnee: And they applied to be… like a medical device in the 60s.

Justin: Wow.

Sydnee: Like I mean that's— I mean this was— they— I mean this was very quickly legitimized. I mean they were taking this very seriously—

Justin: On board, yeah.

Sydnee: — in Japan, yeah. And whereas I think here, in the US, it is now much more of like a [sighs] kind of a medicine-adjacent popular medicine. That's the term we're supposed to use for stuff like this.

Justin: Okay.

Sydnee: There's popular medicine.

Justin: What term do you wanna use for it, though?

Sydnee: [chuckles] I'll get into the study.

Justin: Okay. [laughs]

Sydnee: [chuckles] So—

Justin: [snorts]

Sydnee: [chuckles] So they— Initially they didn't get medical approval for the devices, because It's— It's really difficult, I think, for this process to produce something that is stable and stays that way, kind of like we talked about.

Justin: Right.

Sydnee: Like it—

Justin: It just wants to be water.

Sydnee: You— If you— Yeah, when you use an electric current to change the properties of water, it doesn't necessarily stay that way.

Justin: Gotcha.

Sydnee: So they added calcium lactate to it, and anyway, they were able to make… an actual alkaline pH, a higher pH that stabilized. And so because they could do something, these devices could generate something that was actually different, and that was believed to have an—

A lot of the evidence I think is, again, like we talk about on the show a lot, just because something happens in a petri dish, doesn't mean it happens in real life.

Justin: Right.

Sydnee: The idea that having these ions, these different— could change the nature— it— A lot of this is theoretical. But anyway, it was granted… recognition as a "medical substance generator."

Justin: Alright.

Sydnee: Yes. And—

Justin: Well, then that's the show.

Sydnee: And so like initially, alkaline water got the biggest kind of… endorsement.

Justin: Okay.

Sydnee: And they said you could use it for like chronic diarrhea and indigestion, all kinds of like stomach stuff basically. And then from that, an acidic water, hydrogen water.

Justin: Okay.

Sydnee: Was the next approved, and then eventually we see that like in Korea they followed these. And so like there are other parts of the world where the idea that hydrogen water or alkaline water, either of these, could be healthier for you is well-established and probably the kind of thing where if you said it, people would just sort of nod, like—

This is my assumption, not having been part of that culture, people would say, "Well yeah. I mean like, we know that." In the same way that we say, "You should drink more water," and everybody sort of nods like, "Yes, this is an accepted thing in our culture."

Justin: Right.

Sydnee: "None of us drink enough water."

Justin: Even though that is—

Sydnee: Even thought that isn't necessarily true, by the way. I think it's the same sort of thing. In terms of being able to verify that this— these actually do the things they say they do… we don't necessarily have a lot of evidence for that.

Justin: It seems like it would be really hard to test it, because it seems so… fragile, right?

Sydnee: Yes.

Justin: Like chemically fragile, in a way where doing repeated testing in a way where you know that you're testing it on the same formulation, same concentration is not the right word—

Sydnee: Mm-hmm.

Justin: — but the same, you know, chemical makeup.

Sydnee: Well exactly, because I think the problem is that if you are— if you have a bunch of test subjects in a lab, and you're trying to see like, "If I stick the— If I put these magnesium sticks in this water and turn it into hydrogen water, extra hydrogen in the water."

Justin: Mm-hmm.

Sydnee: "And then I have them drink it. And I have—" And I mean if you're gonna do this with any… any degree of validity, you are going to create the hydrogen water, and then test the hydrogen water to ensure it is what you say it is, right?

Justin: Right.

Sydnee: You're gonna have some sort of standard. "Okay, we created water with X hydrogen…"

Justin: Yeah.

Sydnee: "Molecules in it, right?"

Justin: Right.

Sydnee: And then you're gonna give it to the test subjects, and then you're gonna— whatever outcome you're looking for.

Justin: Right.

Sydnee: Are they— Do they have more energy? Is their diarrhea better? I don't know what you're doing it for, but like…

Justin: Whatever.

Sydnee: Whatever. The problem is that when you replicate that in real life, it's almost impossible. What you would have to do is create your hydrogen water, bottle it, put it on a shelf in a simulated like grocery store environment, right?

Justin: Oh, right.

Sydnee: Wait for some amount of time, and then have people— and then test it and then drink it.

Justin: Mm, yeah.

Sydnee: Is what you need to do.

Justin: Right.

Sydnee: Which is a much more difficult and expensive study to do, and it's… it's easier in a lot of cases just to tell people it's better. What's easier; doing the research and proving it, or coming up with a really clever marketing campaign?

Justin: Yeah.

Sydnee: Where you just sell it to people. 'Cause at the end of the day, if it's just water.

Justin: Hey, listen, I will just say that marketing is not easy.

Sydnee: Well, I'm not—

Justin: And it takes a lot of work to come up with these great campaigns.

Sydnee: [chuckles]

Justin: Our marketers are out there doing the hard work.

Sydnee: Okay.

Justin: They may— No, I'm sorry Sydnee, yeah take a sip of your coffee. That's why I'm talking for a few seconds, so you can drink some coffee, 'cause it's early in the morning and sometimes in the episode you have to talk about for a long time, so then I talk sometimes so you can drink coffee. So folks, if you're sitting here like, "Wow, Justin's really prattling on a little bit."

Sydnee: Mm-hmm.

Justin: It's 'cause Syd wanted to drink some coffee. Our marketer are you there, doing the hard work, creating commercials. It's a thankless job, everybody complains about it.

Everybody says during the Superbowl "I only watched it for the commercials," as though they're so terrible. Our marketers are out there working day and night to try and sell us stuff, and help us find the right things to buy. Help us make— "Look for the helpers," Mr. Rogers says.

Sydnee: Mm-hmm.

Justin: That help us make the good buying decisions.

Sydnee: Mm-hmm.

Justin: You know what I mean? I appreciate 'em. Thank you to our heroic marketers.

Sydnee: I'm not—

Justin: We get emails from all these science people.

Sydnee: [chuckles]

Justin: I want emails from people that are coming up with commercials to sell me new kinds of Doritos. That's what I want, those are the heroes.

Sydnee: I am not insinuating that marketing is easy. I am saying that when it come—

Justin: It may be easier—

Sydnee: I am certainly not insinuating—

Justin: — than studying hydrogen water. [chuckles]

Sydnee: Yes. I am certainly not saying that it is inexpensive. I'm say that dollar for dollar, it's more expensive… and arduous, and time consuming.

Justin: Yeah.

Sydnee: To do like long-term, heavy-duty, peer-reviewed, double-blind, control— You know, all the things that we do to say—

Justin: Yeah, especially if it's—

Sydnee: — is something real or not.

Justin: Especially when the most lucrative option is no. [wheezes] Like no, we didn't— No we didn't, what are—

Sydnee: Right, well it—

Justin: "We don't have an answer," like that's more lucrative to not know.

Sydnee: When you're making something that isn't going to be a prescription pharmaceutical, why would you hold yourself to those standards… if you're just trying to sell it?

Justin: I don't know.

Sydnee: Depending on what your goal is. Now if your goal is really— I mean if you're pure of heart. [chuckles] I don't know. My point is—

Justin: If you're able to force— pull the sword from the stone.

Sydnee: There are a lot of devices that have met approval in Japan to make hydrogen water.

Justin: Right.

Sydnee: The amount of like hydrogen water they make is pretty variable, and I thought it was interesting. I read a lot about like there are pretty strict regulations about how they can market it in Japan.

Justin: Right.

Sydnee: Like it's not like everybody has bought into this and everybody's making all these wild claims on commercials and stuff and everybody's agreeing with it. They have to—

I mean, it's similar to here. You can't just say like, "it'll cure cancer." You can't. And I also read that, similar to the US, and this of course makes sense, just because something is really popular among, you know, the public.

Justin: Mm-hmm.

Sydnee: Does not necessarily mean doctors agree with it. I don't think doctors in Japan are prescribing hydrogen water any more than doctors in US— in the US are.

Justin: Mm.

Sydnee: Do you know what I mean?

Justin: Mm-hmm.

Sydnee: Just because I think what we're talking about is, again, similar—

Justin: Popular science, right.

Sydnee: Popular medicine.

Justin: Popular medicine.

Sydnee: Similar to the idea that everyone in the US, right now, carries a water bottle, and will tell you "You need to drink more water." As a doctor, occasionally, I might tell someone they need to drink more water, but I am not just giving everyone the advice all day long that they need to drink more water, because sometimes you don't need to drink more water.

Justin: Too true.

Sydnee: Sometimes you've had plenty of water. So I think it's the same thing, I don't think we should just assume, you know, I mean.

Justin: Yeah.

Sydnee: Just because it's widely accepted among the public because it's marketed well, something does not necessarily translate to "it is prescribed by doctors."

The thing is that… I found a small study from 2011 that showed consuming whatever hydrogen rich water is improved quality of life measures of patients undergoing radiotherapy for liver tumors.

Justin: Okay.

Sydnee: That's the only study I found, and this was very small and I would not— Again, one study does not change our scientific understanding, and this is a very specific case, and I would not generalize it.

Some of the claims they make, there's just no study for it. Like, "it will promote skin health." I can't find where anyone has studied that, so I don't even know— There's not even like a tiny study. It's like anecdotal.

Justin: I like to think that there's a bunch of— There's gotta be a contingent of Japanese Dr. Sydnees over there—

Sydnee: Mm-hmm. Mm-hmm.

Justin: Who are like, "Guys, you have— The— This water's driving me crazy, it's just water. Please"

Sydnee: I would assume there are. I mean I would assume, but the idea behind it is that hydrogen— those little hydrogen H2s that are floatin' around.

Justin: Mm.

Sydnee: Are antioxidant.

Justin: [in an intrigued tone] Mmm.

Sydnee: So they're gonna help anti-oxidize. [chuckles]

Justin: Mmm.

Sydnee: Your body.

Justin: Sounds pretty good, okay.

Sydnee: By binding with oxygen.

Justin: Now, Syd, if I can just say. Now I'm listenin'.

Sydnee: And so it will—

Justin: Now I'm intrigued.

Sydnee: I mean, but then the claims from that are like— it's like any other antioxidant, right? It's like why they tell you to eat blueberries. They're gonna detoxify you and improve your immune system and give you energy and promote organ health. And like things that you can—

Justin: Why did you wait 'til the end of the episode to tell me all this great stuff?

Sydnee: [chuckles]

Justin: You know who wouldn't have made that mistake? A marketer.

Sydnee: Well—

Justin: All I'm saying, they wouldn't have buried the lead of all these benefits.

Sydnee: [chuckles] Well, the thing is I'm not marketing hydrogen water. What I'm saying is—

Justin: Oh, I know Sydnee. I don't even wanna buy it at this rate.

Sydnee: I have been— I have no— Wait, I would not.

Justin: [wheezes]

Sydnee: It's more expensive than water, and I have no—

Justin: It's got all the extra hydrogen in it!

Sydnee: Well, I have no evidence that it really does any of these things. The—

Justin: You want all that hydrogen for free?

Sydnee: Just because you can put some hydrogen molecules together with other molecules in a lab, and then say, "Look, it ma— it did something. I bet it's good in your body," that doesn't… mean that it has that same impact on the complex system that is the human… body. It—

Justin: [sighs]

Sydnee: Like one does not translate to the other.

Justin: Okay.

Sydnee: I don't have evidence for these claims. I don't have a reason to think hydrogen water would hurt you? Especially since… it's not standardized. You may be buying hydrogen water that, by the time you drink it, has no extra hydrogen in it.

Justin: Yeah.

Sydnee: Because it may have all diffused out.

Justin: Yeah.

Sydnee: So.

Justin: That's true.

Sydnee: So I mean, it's hard for me to say it could hurt you, because it might just be water that you're payin' extra money for. But it hurts you in the sense that one, you're wasting your time and money.

Justin: Yes.

Sydnee: Two, you may be seeking this out instead of something that—

Justin: Actual cures.

Sydnee: — would actually address whatever issue you're having. And three, when people make claims of a miracle… cure for everything that ails you, that will make everything better in your body.

"Your problem is that you haven't been drinking hydrogen water, whatever your problem is, it can be fixed by hydrogen water." It erodes our confidence in any sort of like scientific process—

Justin: Right.

Sydnee: — to arrive at these solutions.

Justin: Yes.

Sydnee: And I don't mean your confidence in the American medical system, 'cause if your confidence in that is eroded, welcome to the club. I mean yes, of course. But the scientific method… is sound. [chuckles]

Justin: Right.

Sydnee: Is valid. Separate that out from the structure we've built around healthcare.

Justin: It can—

Sydnee: There is a way to find answers.

Justin: If you can—

Sydnee: Truth can be known.

Justin: If you contort science to suit your own needs, then it kind of devalues the whole public faith in the enterprise.

Sydnee: Exactly. So I— That is the deal with hydrogen water. I have no evidence to say you should drink hydrogen water.

Justin: Maybe you even shouldn't.

Sydnee: I—

Justin: I don’t know.

Sydnee: I mean, I— Let me say this. I am not going to start drinking hydrogen water, or alkaline water. I am going to continue to try to consume an appropriate amount—

Justin: Only drink beer.

Sydnee: [chuckles]

Justin: No?

Sydnee: No, of water.

Justin: Water. Right, got it.

Sydnee: Regular old.

Justin: Regular old classic water.

Sydnee: As everyone on TikTok is fond of saying, I grew up drinking out of a garden hose.

Justin: [chuckles]

Sydnee: Right now, and so I’ll just keep drinking water.

Justin: That is gonna do it for us this week. Thank you so much for listening. Thanks to the Taxpayers for the use of their song “Medicines” as the intro and outro of our program. And thanks to you for listening, we sure appreciate it.

[theme music fades in]

Justin: That’s gonna do it for us for this week. Til next time, my name’s Justin McElroy.

Sydnee: And I’m Sydnee McElroy.

Justin: And as always, don’t drill a hole in your head.

[outro theme music plays]

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