

Sawbones 365: Chlorophyll

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[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. That was a big pause there that you took.

Justin: When?

Sydnee: Just then, like, as we got started.

Justin: I wanted to build some suspense as to who I was.

Sydnee: Oh, okay. Like maybe they wouldn't know this time?

Justin: And now my identity has been revealed! I'm Justin McElroy.

Sydnee: Hi, Justin. Yes, it's still you. And it's still me. Um, Justin.

Justin: Sydnee.

Sydnee: You... kept— you've been on TikTok a lot lately.

Justin: Mainly just watching your great TikToks, and, um, people making various recipes out of cake mix and two other ingredients. A lot of that.

Sydnee: Yeah, that's true. Don't mix it. That's always the key in those.

Justin: Don't mix it!

Sydnee: Don't mix it.

Justin: You're gonna be tempted to. You just sprinkle it over top, couple pieces of butter, you got a dump cake goin'.

Sydnee: Um, but there are also sometimes, I would say, wellness trends on TikTok.

Justin: Hmm! That's a generous way of putting it.

Sydnee: Yeah, I don't get a lot of those in my algorithm. Can't imagine why.

Justin: Huh! No!

Sydnee: Can't fathom why. But I have heard from many, many of our listeners, too many to name— I would name you all, but so many people emailed this topic, uh, in quick— quick succession. [laughs] And I looked. People have been actually recommending this topic for a few years, I'm just slow on the uptake of this one. Uh, but apparently chlorophyll is a big TikTok trend right now.

Justin: For humans?

Sydnee: Yes, honey, for humans.

Justin: It's been huge on plant TikTok for a long time.

Sydnee: Right. [laughs]

Justin: They're wild about it over there.

Sydnee: That's right. Plants have been on the chlorophyll trend— they were— they knew chlorophyll was cool before it was cool.

Justin: Yeah.

Sydnee: But humans are just now...

Justin: Getting into it.

Sydnee: Gettin' into it.

Justin: This is good! I'm loving turning the power of the sun into usable energy for me.

Sydnee: So thank you if you emailed in about chlorophyll now or in the past several years. There are so many of you I can't name you all, just know I'm talking to you right now.

Justin: Personally.

Sydnee: This is just for you, yes.

Justin: And not the other people who also did it. Just mainly you.

Sydnee: Just you. Um, so, Justin.

Justin: Yes.

Sydnee: What do you remember about chlorophyll from your— when did we— elementary school science class, probably?

Justin: Yeah, I checked out after that. Then I got—

Sydnee: Third through fifth grade science? Somewhere in that range.

Justin: I had some stuff— I had, like, biology, and I think there was some plant stuff in there in college, but I worked out a system with my friends where one of us would go Monday and one of us would go Wednesday [holding back laughter] and one of us would go Friday, and then we would just compare notes so we didn't all have to go to class all the days, and I'm pretty sure I didn't go to class... on plant day. You know— like, on the day we were refreshing for college.

Sydnee: Right. [holding back laughter] So you don't know what chlorophyll does for plants?

Justin: It's the green stuff.

Sydnee: Okay, that's a start.

Justin: I'm gonna help. I'm— let me—

Sydnee: Uh-huh?

Justin: —basically it's the good green stuff that takes— that lets plants...

Sydnee: You got this, come on.

Justin: Yeah. It takes plants, and the sun... is in there. And then it turns, like, the— the— carb—

Sydnee: There's a word here you're looking for.

Justin: —carbon dioxide into... [stammers] oxygen photosynthesis.

Sydnee: Photosynthesis! Good job, you got it! Yes. It's a—

Justin: I'm gonna go— I'm gonna lay down. [wheeze-laughs]

Sydnee: It's the pi—[laughs quietly]

Justin: Lay down.

Sydnee: —pigment present in plants and algae that is responsible for their green color, and it is stored in chloroplasts. You remember that? Did you have to make the cells, and you make the animal cell and the plant cell and you gotta make a cake or something that looks like one?

Justin: My mom did it for me.

Sydnee: Oh, okay.

Justin: [wheeze-laughs] Sorry!

Sydnee: I loved making those.

Justin: What?!

Sydnee: I know, it's shocking. Mine was one of those big cookies.

Justin: This— this is our first time meeting, so you can imagine my shock at finding out that you loved making cell models!

Sydnee: Apparently as a kid that's very important, because I had to do it many times, I feel like, for school. Like, I had to make multiple edible cells for school. Loved every one of 'em. Can't wait, can't *wait* to do that with our kids. Can't wait for that day.

Justin: Oh yeah. Oh yeah.

Sydnee: Anyway, so, it absorbs sunlight to give plants energy. That's photosynthesis. It's the way that plants... give us oxygen.

Justin: Yes.

Sydnee: Yes. So it's important for plants, it's important for humans. We have known about it since 1817 in the plant realm, but when did we decide it's medicine? When did we decide that not only was chlorophyll important for, you know, photosynthesis in plants and the creation of oxygen, which is the, you know, thing we need to survive. When did we decide that we should ingest it?

Justin: I don't— I don't know.

Sydnee: This seems like a recent trend, but it actually isn't.

Justin: Really?

Sydnee: I thought this was really— this was really fascinating. So, a lot of what you'll read about, the current articles about it kind of focus on the last few years. It seems like maybe, like, 2018 is when this was sort of revived, or thereabouts. That's at least when it was a big enough trend that it ascended into the public consciousness and there were, like, thinkpieces about it and, like, popular science articles about it and stuff.

But that is not the first time that people investigated the potential health benefits of chlorophyll. For that, we have to go back to 1930.

Justin: Wow, all the way back.

Sydnee: Yes. At Temple University, in the lab of Dr. William Gruskin. Now, Dr. Gruskin was intrigued by the potential of chlorophyll to do a lot of things. And when we get into the whys, why did Dr. Gruskin think that chlorophyll might have all this medicinal potential, I don't have a great answer for— it's really hard for me to try to figure out exactly what the first thought was.

You know, why do you think one thing might be medicine? Why is this the thing that you decide to focus on? Is it just that it is the area of your research, and so you may as well look for all applications of it? I mean, that's certainly true sometimes. Other— other suggestions have been that if you look at the chlorophyll molecule, it's similar to the hemoglobin molecule in our human bodies.

Justin: That's one of the blood ones.

Sydnee: Yes. There is a place where iron and magnesium— we have iron and they have magnesium instead, the plants— but anyway, it's very similar. So maybe the thought was like, "This looks like hemoglobin."

Actually, I don't know if we knew the structure of hemoglo— I don't know if he knew the structure of hemoglobin.

Anyway, this has been suggested as to why it has potential benefits is, "Well, it's kind of like hemoglobin."

It does not— here's a spoiler. It does not function exactly like hemoglobin in your human body, so please don't think it does. But maybe that's why?

Justin: I don't know.

Sydnee: For whatever reason, Dr. Gruskin was interested in the potential of chlorophyll to do a few different things. He started off— and these were not commercial applications. He was very much looking at, like, bench research applications. What does this do in a lab? I'm not necessarily thinking about selling it to anybody.

Justin: Okay. Dabble.

Sydnee: Yes, exactly. So he tried it first for things like wounds and burns. Like, "What if I apply to people in, like, an ointment or paste or something? Does it

help wounds heal faster? Does it help burns heal faster? Um, is it good for things like varicose veins? What if we apply it, ingest it, somehow take it? Does it help with that? Does it help with, like... trench mouth? Like, an infection of some sort. Does it help with... a brain abscess?" [laughs quietly] So—

Justin: Theory— theory was, it's doin' something in plants. Maybe it would do something for us. We just don't know what!

Sydnee: A wide variety of applications Dr. Gruskin tried. Um, there was not one thing that sort of came from that research, right? There wasn't, like, this giant medical breakthrough. Which, to be fair, wasn't exactly what he was looking for anyway. I mean, sort of. But...

Justin: Would've been nice. You always *want* a breakthrough, a huge scientific breakthrough.

Sydnee: Yeah, but when you're doing pure research, a lot of what you know you're doing is building a body of knowledge that someday may have an application. But, like, right now it's this... understanding is what you're seeking.

Justin: Yeah.

Sydnee: Which is— is beautiful in that sense. The understanding, that is the goal.

Justin: Yeah, but if it turns into, like, a super good toothpaste or something like that, you're not gonna kick it out of bed. I mean, you're gonna be—

Sydnee: You are s—

Justin: —you're gonna be pretty excited.

Sydnee: —you are so close to what's about to happen.

Justin: Oh really? [laughs]

Sydnee: That was very— that was very strange that that's where you went. So, his research was funded by a nonprofit called The Lakeland Foundation. And they had made a deal with him—

Justin: Sounds— again, I wanna— this is a *Sawbones* sidebar, one of our classic segments that we always do—

Sydnee: Uh-huh.

Justin: —and it's Justin Rates the Suspiciousness of an Organization Based on Its Name—

Sydnee: [laughs]

Justin: —and I'm gonna go ahead and give Lakeland— sorry, what was it?

Sydnee: Foundation.

Justin: The Lakeland Foundation, like, a seven out of ten chance that it is Illuminati. [laughs] Like, one of— like, very, very likely, likely Illuminati.

Sydnee: I have no evidence for any, um, shadiness to The Lakeland Foundation.

Justin: Okay.

Sydnee: From— from this story, at least. Like, where this is going.

Justin: If a character shows up on your favorite show, *Fringe*, and they're like, "[stiffly] My name is Roger Peterson and I'm from The Lakeland Foundation."

100% that's an alien. 100% he's come through the— from the other dimension.

Sydnee: Well, no, they're not aliens.

Justin: Uh-huh.

Sydnee: They're us from... the other... timeline.

Justin: Aw, geek check!

Sydnee: It's the— yeah.

Justin: You walked right into it.

Sydnee: It is not... see, there are multiple time streams, and they are built on top— anyway. We can talk about *Fringe* later. [laughs quietly]

Justin: [amused] We can't, actually. [laughs] I'm deciding now.

Sydnee: Now you have to. So, they had a right to patent anything that came— useful that would come out of this, right? Like, he's in it for the science. He's in it for the love of the game. And they're like, "That's fine. We'll fund that. But if you get anything good out of this, we get to patent it."

Justin: "You find any portals or Nazi gold... "

Sydnee: Yes.

Justin: [wheezes] "You know it becomes the sole property of The Lakeland Foundation."

Sydnee: They would— and so they did just that in 1937. They patented the use of chlorophyll that was dissolved in an aqueous solution, to find a way to take the chlorophyll molecule and—

Justin: What's that mean?

Sydnee: —dissolve it in water.

Justin: Okay.

Sydnee: That process was patented.

Justin: Sorry, did you describe water as an aqueous solution?

Sydnee: [laughs] Well, something with water.

Justin: Okay.

Sydnee: I mean, aqueous means, like, any, wa— like, liquid.

Justin: Dissolved in an aqueous solution.

Sydnee: Uh-huh.

Justin: You mean water.

Sydnee: Yes.

Justin: Dissolved in water?

Sydnee: Yes. But also, like, if you threw other things in there it would still be under the patent.

Justin: Okay. Got it.

Sydnee: Because you can't— so, like, you have to find a specific form of chlorophyll in order to— like, this didn't happen immediately. It's not like he just dropped chlorophyll in water and went, "Made that." Like, that took some science to figure out.

Justin: Okay.

Sydnee: So he did that, and patented that. Um, or the Foundation did. But they didn't have, like, one use to push it for. They just had this ability, and if it does have some sort of medicinal potential, they've got the patent on it, right? So they're just kind of sitting on it.

Um, and it was essentially unused for a while. And it is important to note that one result of his research that he really didn't pay much attention to, um, because he was looking for, like, more purely medical benefits, like, actually treat, cure disease benefits, uh, one thing that was unexpected is the idea that it might serve as a deodorizing agent.

Justin: Hmm.

Sydnee: Um, but he wasn't really focused on that. But in the mid-1940's, there was a young advertising executive named O'Neill Ryan, and he heard about—

Justin: Not Ryan O'Neal—

Sydnee: No.

Justin: —star of *What's Up, Doc?*

Sydnee: [laughs]

Justin: O'Neill Ryan.

Sydnee: He heard about— yes, that is actually— yes. He heard about this research around chlorophyll that Dr. Gruskin had done from a friend over dinner. And, like, at the time he was looking for something. And I guess maybe this would've been common at this period. To, like, be in advertising and actively looking for, like, a product. Not just to, like, "Here's a product that's already on the market and I'm gonna help them create a campaign," but like, "I'm gonna bring the product to market." Right?

Justin: Got it, right.

Sydnee: I don't— maybe that's still— I don't think so.

Justin: Its much purer.

Sydnee: Yeah, yeah. This is more than just— he doesn't just want to market it. He wants to be the one behind it, and market it.

Justin: Okay, got it.

Sydnee: And so he was looking for something, and this sounded promising, so he went to Lakeland and after some negotiations persuaded them to give him, like, sole licensing rights.

Justin: Okay.

Sydnee: Like, "I'm the only one who can license this product, whatever it is." At this point, it's still just chlorophyll and water.

Justin: You see this on shark tank. "They have these great hooks in Germany that I loved and I got the sole rights to have them over here."

Sydnee: Yes. So after he had the rights, he went to another businessman, Walter Stanton, and said, "Let's do this together. Let's find some way to make this a thing. Uh, I think there's some potential here. Let's make a company." So they took Ryan and Stanton and made Rystan.

Justin: Okay.

Sydnee: And that was the name of their company.

Justin: That's their son.

Sydnee: No. [laughs quietly] It's not their son, that's the— I mean, I don't know. Some people call their business their baby, so, yes.

Justin: Sure.

Sydnee: This was their business baby, Rystan. And the idea was that they were gonna sell chlorophyll products to people. They went through, like— they claimed, like, 600 different formulations before they figured out exactly the right solution, you know, the right thing that they wanted to sell. Um, and they had a line that they were going to come out with, 12 different products under the name Chloresium. The line of products was the Chloresium line. All chlorophyll containing.

Um, it's weird, 'cause every time I hear this, I think chlorine.

Justin: Yeah.

Sydnee: Which, like, you don't wanna... drink.

Justin: No.

Sydnee: But I don't know. Which of course would be part of the—[laughs] the challenge.

Justin: Chlorine probably wouldn't be— at this time, though, a lot of people wouldn't— there weren't swimming pools. Like, people wouldn't be thinking about chlorine too much, I wouldn't think, right?

Sydnee: That's true, that's true. Um, and so the first thing they came out with in 1948... was toothpaste.

[pause]

Justin: Um...

Sydnee: Just as you... foreshadowed.

Justin: Wow. You're saying I nailed it?

Sydnee: Yes.

Justin: Wow. That's amazing.

Sydnee: So they did all this work—

Justin: I didn't read ahead.

Sydnee: —they had this company. They have big dreams, big hopes. They introduced their chlorophyll toothpaste. And it doesn't make a big splash. People don't get it. Right? Like, "There are lots of toothpastes. There are ones I already know about. I don't understand why chlorophyll would be helpful for me. I don't know what you want me to do with this." They just don't get it, right?

Justin: Don't want it.

Sydnee: So, like, 1948, the toothpaste comes out. Nobody's particularly excited. Now, there were other people, though, who were interested in this area and were also trying to hop on the bandwagon, so to speak.

Justin: [through laughter] The nonexi— the currently nonexistent bandwagon.

Sydnee: There was a belief that there was a potential here. And, I mean, you'll see. They're not— they are not wrong. They're just not there yet.

So there was another researcher named F. Howard Westcott, and he had been looking into the potential of chlorophyll to treat anemia. Which, again, this is why I think that the similarity to the hemoglobin molecule must be at the root of a lot of these ideas, is because that tracks, right? If you think it's like hemoglobin, then maybe it would help treat anemia.

Justin: Yeah.

Sydnee: So, anyway. He was looking into that, but he also noticed that specifically it had some odor neutralizing effects— at least, this is what he said— for things related to, like, asparagus and Vitamin B. Like, if you ate those things, which are notoriously— they will cause you to have odors, right? That people think are unpleasant.

Um, that he saw that it helped with that. And he, unlike Gruskin, was down for some applied science, here. He was all about, "What can I do in a lab that we could bring to the people?"

Um, and so he knew that a deodorizing formula is a lot more marketable than, uh, "This treats a brain abscess."

Justin: Yes.

Sydnee: Very important, but not the kind of thing you have a lot of commercials for. So he decided that what he was gonna do was really focus on that deodorizing potential, and see if he could do some experiments to prove it.

Justin: And?

Sydnee: Well, I'm gonna tell you what happened.

Justin: Aw!

Sydnee: After we go to the billing department.

Justin: I didn't see that one coming, actually. This— this time you got me. Let's go!

[ad break]

Justin: Okay, Syd. I got my wallet out. I'm ready to invest. What happened?

Sydnee: So, Westcott did a study... [laughs quietly] if you can call it that... where he gave people he worked with, one doctor and four nurses... [laughs quietly]

Justin: [laughs]

Sydnee: Uh-huh?

Justin: Limited sample size!

Sydnee: A dose of chlorophyll. And then at the end of the day he had them rate their underarm odor.

Justin: Rate their own?!

Sydnee: Rate their own underarm odor. "Do you feel like you're less stinky today than you were yesterday when you didn't get chlorophyll?"

Justin: "Are you less stinky now than you were four years ago?"

Sydnee: [laughs quietly] And based on this "study"— again, air quotes— he— this yielded a 50% reduction in odor.

Justin: Can I imagine walking in a room to see a doctor and four nurses both just, like, all smelling their own pits? Like, "Hm. Nice."

Sydnee: Just smelling their pits.

Justin: "That's, like, a six. Not bad... choice. 50% better BO today!" [wheeze-laughs]

Sydnee: So he expanded that, uh, to a bunch of college students, and had them all take a dose of chlorophyll and rate their stinkiness, and he claimed that the results are pretty similar. This cuts your body odor in half if you take chlorophyll once a day.

At the end of it, he concluded— what he said was— he was quoted, "The only effective treatment for onion-eaters was the clean the mouth thoroughly and then use a chlorophyll mouthwash or suck a chlorophyll tablet."

Justin: Blech.

Sydnee: And that it was good for bad breath, um, if you were a smoker, uh, or if you had an upset stomach.

Justin: Hmm.

Sydnee: He claimed all this. You can, uh—

Justin: That's a lot of things to be fixed by one thing!

Sydnee: You can, uh— you can just take chlorophyll. And the smart thing that Westcott knew to do is— and I mentioned that already— he said a chlorophyll mouthwash or suck a chlorophyll tablet. Now, why is that important? What is the patent that Rystan has?

Justin: Ahh. Water, dissolved in water.

Sydnee: So if he could make a tablet form, he doesn't have to worry about that existing patent.

Justin: And that's convenient, too. You could throw one in your— in your purse, in your pocket.

Sydnee: So all of this would probably still be for naught at this point, uh, because the public wasn't interested in chlorophyll. They didn't know what it was, they didn't know why they needed it. Uh, some stinky college students was not— it was not enough to convince them. Nobody was buying chlorophyll, tablet or otherwise, until in the summer of 1950 Reader's Digest published an article called "Nature's Deodorant: All About the Magical Deodorizing Powers of Chlorophyll."

Justin: Wow. Reader's Digest really putting their thumb on the scales, there.

Sydnee: They really did, of history at this moment. I love this kind of thing. Anyway, so this article came out and the public—

Justin: By "this kind of thing" do you mean Reader's Digest, a magazine to which you do have an ongoing subscription?

Sydnee: [laughs quietly] I love the, um— the joke ones. Laughter is the Best Medicine, and Humor in Uniform, and... there's another one. I love those.

Justin: Yeah. Everyone there— it says— there's a little note in there that says, "Thank you to our only 38-year-old subscriber. What an honor it is to have [through laughter] a millennial like yourself... still enjoying our magazine."

Sydnee: I used to keep all of my Reader's Digests. Um, anyway, so, this article comes out and everybody is like, "Oh my gosh." It is the 50's, then chlorophyll is the thing. We love it.

Uh, and Rystan is already sittin' pretty, because they've already got their Chlorodent toothpaste out there, and they are the ones with the patent to, if it's gonna be in a liquid, they're the ones who get to do it. So, like, the mouthwashes and the toothpastes and all the different products that you could put on your skin, or drink, or whatever, they're falling under Rystan.

At the same time, you have companies like Nullo chlorophyll tablets, who were using Westcott's patent and basically his, um, intellectual property to develop their products, right? So you have all these different chlorophyll products that all come to the market at the same time as this article comes out, and everybody wants some.

There were, like, Clorets gum and mints that you could buy, in addition to the tablets and the toothpastes and the mouthwashes. There was a form of Palmolive that was introduced. You know, the soap?

Justin: Mm-hmm, mm-hmm.

Sydnee: 'Cause that was already a big product at this point. They just added chlorophyll to it for a while and were like, "Look! Palmolive has chlorophyll now! It's great! Buy it!"

Justin: "You guys like that, right?"

Sydnee: Uh, there was even a cigarette brand, Hale Cigarettes, which had, like, a Chloro-Filter on them.

Justin: Chlorophyll-ter?

Sydnee: [laughs] I don't even know if they— you know, I gotta look at the ads. And the ads were all very explicit. This is what they do, right? Like, this is the goal of advertising. Make you feel insecure about something.

The ads were very explicit. "You smell bad. Your underarms smell bad. Your mouth smells bad. You smell bad."

Justin: That's adver—

Sydnee: "And the only thing you can do about it is chlorophyll."

Justin: That's advertising, though. Advertising is designed to make you sad.

Sydnee: Well, it worked, because in 1952—

Justin: Feel bad about yourself.

Sydnee: —uh, by 1952 there was an article that came out that dubbed it "The Year That Everything Turned Green." [laughs] Because everybody was buying chlorophyll constantly. Which is something— I've never heard of this. I didn't know this was a giant fad.

Justin: No.

Sydnee: Um, but as fads go, just as soon as the public was going wild and everybody was ingesting chlorophyll in every form that they could, just as soon as it got going... it started to die off.

Justin: That's fads for you. That's the problem. That's why they don't call them... I don't know. Permanent cultural shifts. [laughs quietly]

Sydnee: This was just a fad. Um, just like many of these sort of pseudo-medical trends. They pop up, everybody goes wild for them, and the same year that they hit it big is the same year they sort of collapse on themselves.

Um, first the FDA stepped in to sort of ruin the fun and were like, "Actually, none of this is based on any science."

Justin: [laughs] "Sorry that we've been sleeping on this for so long."

Sydnee: "Yeah, I'm glad you guys like chlorophyll so much, but there are no high quality studies that could support anything that we're saying here."

Um, and then the FTC stepped in and was like, "You actually can't market any of these claims, because you don't have anything to back them up, and we're really mad at all of you for your advertising, and we— no. None of this is okay."

So they started shutting things down and debunking claims. And then the Journal of the American Medical Association published a big article after that. And this was all in, like— in 1952 into 1953. That said, like, "Okay, none of these claims are backed by hard science. Uh, the way that Westcott did these studies is not how we do science. Right? Like, we don't ask our friends to sniff their armpits and tell us if they smell better. That's not— that's not the scientific method."

And then they pointed out this sort of— kind of last little note. Like, basically they were saying, "We don't know if chlorophyll can do any of this. We're not saying it can't. We're just saying we don't have— none of these studies actually prove that it does. And the only thing we'd throw out there is that in addition to needing high quality scientific studies to see if this works... anecdotally, there are a lot of animals that eat plants all the time. And if you thought chlorophyll was really good at blocking odor, wouldn't goats smell better?"

[laughs]

Justin: Anec-goat-ally.

Sydnee: [laughs] Hey!

Justin: Thanks.

Sydnee: That was nice. Um, which I don't know if that's a scientifically sound statement, but there it is. So, the fad faded.

Justin: I mean, it's as good as having your buds smell their pits. [wheeze-laugh] It's at least as logical as that.

Sydnee: "Wouldn't— wouldn't you think that goats would smell better?" I love that— I can see, as a physi— this is not me throwing shade, because I am a doctor and I can see myself writing something like this. Where I think, like, I'm writing my article and I got all my science in there, and then I'm like, "This is gonna sound so clever. Gotcha! Wouldn't goats smell better?"

Justin: But what about— I just feel bad for the goats. Like, don't you think that goats are like, "This is unnecessary."

Sydnee: [laughs] "Why'd you have to bring me into this?"

Justin: "You didn't— I'm not— I live outside." [wheezes]

Sydnee: [laughs]

Justin: "I live outside and don't bathe, like, that much, so... "

Sydnee: There are a lot of factors at play here, guys.

Justin: "Yeah, I have other factors at play."

Sydnee: [laughs]

Justin: "Like, I don't understand. This seems unnecessary. I'm just trying to eat this can. Like in cartoons."

Sydnee: [laughs] So the fad faded, and people moved on to whatever became the next big medical trend in 1953 and 1954 and so on. Um, until, like I said, the past few years. It seems like these articles started popping up again in 2018. I am certain there were people trying this before then. Um, because the supplement has existed ever since the 50's.

Uh, you could— you can buy, and you have been able to buy, like, chlorophyll tablets or drops over, you know— usually from, like, um... supplement, vitamin-type stores, or just, like, pharmacies. You know, you can buy these kinds of things. Recommended dose between 100 and 300 milligrams a day. Just sort of like, "Here's this thing." Nobody really takes it anymore, but it's still out there.

Um, and it still exists in that form. You can find tablets, you can find— the droppers are very popular. That seems to be, uh, what a lot of people on TikTok like, is the idea of, like, putting a few drops of it in your water or whatever drink. And, um— especially water, though, 'cause then it turns that bright green.

Justin: Love that. Love that. It's great for TikTok, too.

Sydnee: Yeah.

Justin: The visual is huge.

Sydnee: You can use, um— you can use it in smoothies, too. A lot of people like the idea that you can use it in smoothies. And there are other, like, formulations

that I have found just in, like, quick google searches of what products are out there with chlorophyll in them. And there are tons. There are tons of them. Of course, people like Gwyneth Paltrow on goop have touted the benefits of chlorophyll periodically, and they advertise one chlorophyll product, right? We found? Chlorella?

Justin: Yes.

Sydnee: Yes. That you can buy. Um, and then there are a lot of other influencers and celebrities who have also claimed various medical uses now for chlorophyll supplements, chlorophyll drops, chlorophyll smoothies, chlorophyll... whatever. What is it supposed to be good for, then? Is it still just deodorizing?

'Cause I don't— it's hard for me to imagine a lot of these, like, celebrities wanting to stand up and be like, "I smelled so bad until... "

Justin: "Chlorophyll."

Sydnee: "... chlorophyll." Um, the deodorizing thing is still out there. That hasn't gone away. But now people also claim a lot of other things. One arena in which it has become very popular is skincare. The idea that you can either use, like, a face mask with chlorophyll in it or some sort of topical applications on your skin, like on— topical meaning on the skin— that will improve, like, acne, or just generally give you clearer, brighter skin, that kind of thing is out there.

There have been some, um, studies that have tried to prove this, but none of them are, like, big enough or high quality enough to know, like, is it— is that really making a difference? Or— you know? So, like, this is not really supported by evidence yet, but there are a lot of people claiming that they like the way their skin looks better now that they've either been ingesting or applying chlorophyll.

Um, 'cause that's the other thing. You can just drink the smoothies or water with chlorophyll or whatever, and that's supposedly good for your skin, too. So you can— you can inge— you can take it either way... hypothetically.

Justin: Yeah.

Sydnee: [laughs] In addition, uh, there are claims that it's a weight loss aid, that it— yes, there are some very insidious anti-cancer claims. Um, the antioxidant thing, it's all antioxidants.

Justin: It's all fun and games until it starts curing cancer.

Sydnee: And then all the vague stuff, too. Like, you'll find, like, "Chlorophyll detox packs."

Justin: Yeah. "It boosted my energy."

Sydnee: "Immune system support."

Justin: "My vibration is now improved."

Sydnee: "Improve your wellness." And just those sort of, like, vague— like, "This doesn't do anything, but we really wanna sell it to you, and here it is."

And it looks exotic, I guess, because it turns your water green, and that's very exciting.

Justin: [quietly] We're so stupid sometimes.

Sydnee: I don't know.

Justin: I love humans. I'm a humanist. We can be so dumb sometimes.
[wheezes]

Sydnee: [laughs quietly]

Justin: "[excitedly] Turned my water green! Woo hoo! This is fixing me!"

Sydnee: This is very exciting to people. It turns the water green, and it might turn your poop and pee green, so...

Justin: That's how you know it's working.

Sydnee: Exactly.

Justin: But of course I'm the— I'm the dummy that likes the asparagus scent in my pee, because it reminds me that a few hours ago I was— I made a great choice. You know what I mean?

Sydnee: Yeah.

Justin: I— like, I'm dumb t—

Sydnee: So you can feel—

Justin: —I'm—

Sydnee: —you can feel good about yourself if you—[laughs]

Justin: It's like, "I *did* eat asparagus! Good for you, J-Man! Thanks, past J-Man for that healthy choice! Thanks for the nutrients. Do appreciate it. Great choice. Good fiber."

Sydnee: Um, the form that is used most is chlorophyllin, which is, like, a semi-synthetic— it's like a salt with sodium and copper in order to make it water-soluble, in order to make it dissolve in water.

Um, and in terms of research on this to, like, prove what does it actually do, most of it has been done in a lab, in petri dishes. There have been some attempts at some early animal studies for things like wounds, burns, cancer-fighting properties, whatever. And none of these have been replicated in humans.

There's no evidence right now that it does any of this stuff in humans. Again, a lot of this is always, like, a theoretical sort of idea. Like, "Well, but it's antioxidant, and so wouldn't that be... you know. Wouldn't that be good for us?"

Um, the only evidence that has actually produced anything with chlorophyll... there was a study done in 1980 [laughs quietly] on nursing home residents and odor. And the idea was that if you gave these people who lived in this nursing home chlorophyll, that you could reduce their body odor, their flatulence, and the odor of their bowel movements.

Justin: Yeah.

Sydnee: And according to this study, it yielded positive results.

Justin: Okay! Well, that's settled.

Sydnee: Everybody was less smelly after they took chlorophyllin, but it was a very— it was, like, 63 people. It was a very small sample. Um, and there's no— by the way, a lot of times we kind of try to understand, why would that happen, right? Why would chlorophyll reduce your body odor?

I can't find, like, a good mechanism for this. Like, how does that happen in the human body? And I'm not saying that we always know. There are certainly medicines that do certain things, and we don't fully understand why they do them, but we have done studies repeatedly to prove that yeah, it does do this thing. Still not sure why, but it does do it.

Justin: Right.

Sydnee: Um, with this, with chlorophyll, we don't really have good hard evidence that it reduces body odor, and we also don't know how or why it would. So we're missing kind of both pieces.

Justin: Yeah.

Sydnee: Um, there was some interesting research in 2001 about chlorophyllin in aflatoxin, which is a toxin that's made by fungus, fungi.

Justin: Okay.

Sydnee: And the idea is that if you are exposed to a lot of aflatoxins in your food, which in, like, certain parts of China these toxins can contaminate a lot of food, and if you're exposed to them for a long time it can increase your risk of developing liver cancer later on. Um, and so they did a study where they tried to give people chlorophyll to see if it would, like, reduce the amount of damage that the aflatoxins can do, and they did see some positive results in this study. This idea that, like, if you're being exposed to these very specific toxins, taking chlorophyll can help neutralize them.

Justin: Okay.

Sydnee: And then the idea would be you're less likely to get cancer later. They did not follow the study out long enough to ever prove that benefit, so we can't say that.

Justin: Okay.

Sydnee: It's interesting, it's intriguing, and I think certainly if you see that result in one study, you could do other studies about that specific thing to address that specific problem. But to take that and claim that it can prevent, treat, cure cancer, is obviously false.

Justin: Yeah.

Sydnee: We do not have evidence of that. Can it hurt you? Well, other than making your pee and poop green, which it might, not— not really. There are some concerns. It can make you a little more sensitive to sun. There are some medicines that do that, too, so you could take it and you're more likely to get a sunburn, which is bad.

Justin: 'Cause you're soaking up so many of those rays and converting them into energy.

Sydnee: [laughs] It will not make you create oxygen like that. I don't think you can do photosynthesis from taking it. There's no evidence for that.

Um, it can cause some loose stools, maybe. It has not been proven overtly dangerous as of yet, um, but there are no high-quality studies to say, like, what would the toxic dose be? Is there an amount you could take that would kill you?

Justin: [laughs quietly] Folks, remember, as Sydnee always reminds me, there's a toxic dose of everything.

Sydnee: [laughs quietly] Um, we don't know about interactions with other medications. We talked about that with St. John's Wort, right? Like, it's important to know that it can— if you're gonna take it, it can interact with some of the medications you might already be on.

Um, we don't really know that about chlorophyll. There's no proposed idea that it does, we just don't know. Um, and we don't know things about, like, how would it interact in people with other underlying chronic illnesses, or pregnant people, or breastfeeding people, or kids?

Um, we have no idea about any of that. So to just say, like, "Well, it doesn't seem to hurt anybody. I'm sure it's safe."

That's a huge stretch. Right now we just— we just don't know. We don't think it can hurt you, but we have no idea. And so I would never— based on that lack of evidence, I would never recommend taking it. Especially when I don't know that it would do anything good for you.

Justin: Fair. Fair enough.

Sydnee: And certainly if you are considering it, you should talk with your primary care provider about it first. Um, because if you're in any of those groups where you might be higher risk, maybe it's not a risk you want to take.

Justin: But Syd, I gotta have my chlorophyll!

Sydnee: Here's the thing. If you want to take chlorophyll...

Justin: I do.

Sydnee: ... my recommendation is to eat your vegetables.

Justin: Ugh.

Sydnee: Because—

Justin: Start over, I don't like this.

Sydnee: —two cups of raw spinach equal the amount that a liquid supplement suggested dose would be, like, 15 drops. It's the same amount.

Justin: Okay. Have you ever eaten two cups of raw spinach?

Sydnee: That's not that much! It's raw!

Justin: It's so much.

Sydnee: It's fluffy. Think about it.

Justin: [sighs] Okay, yeah.

Sydnee: I mean, like, that's not a lot of spinach. And also, I will say—

Justin: It's a lot of spinach for me.

Sydnee: —um, two things. The reason that in my mind the spinach, or whatever vegetable you want to replace with this, whatever— especially green vegetables, that's what we're talking about— the reason the vegetable is superior to the liquid or pill or whatever supplement... one, it can be a cost issue. I mean, typically a bag of spinach is not particularly expensive. And for some of these supplements, you could be paying 30 or 40 bucks. Now, there are cheaper versions out there. I'm not— there are so many different versions of this out there.

Justin: Yeah.

Sydnee: Um, and again, we've talked about this before. You don't know exactly what's in them.

Justin: It's just plant blood. It's cheap and easy to produce.

Sydnee: [laughs quietly] That is how it's, um... plant blood is how it's—

Justin: Really?!

Sydnee: —it's been billed before.

Justin: God.

Sydnee: Yeah. Um—[laughs] that's funny that you say that.

Justin: I'm crushing it this episode.

Sydnee: You really are.

Justin: I'm really in tune with the hucksters this time.

Sydnee: I know. You could do this. Uh, you could be a patent medicine salesman.

So, even if you could get it cheaper, the other thing I would say, the advantage of the vegetable itself over these supplements, spinach also has Vitamin A, C, K, Folate, Calcium, Iron— it's good, it's yummy, you can throw it in with a meal and it tastes good. You can make a salad out of it—

Justin: Stop! Dr. McElroy, stop!

Sydnee: [laughs quietly]

Justin: I'm not gonna let you use this podcast as a platform to peddle your lies about how spinach is— let me check the transcript— yummy?!

Sydnee: I like spinach! Spinach is good!

Justin: Yummy?!

Sydnee: I like spinach!

[pause]

Justin: You are losing cre— you realize you lose credibility when you do things like this.

Sydnee: If you don't—

Justin: Your credibility is so important to the— it's the bedrock of this podcast, and you— you peddle it away [through laughter] when you say things, use this platform to say things like "Spinach is yummy!"

Sydnee: You could eat other vegetables. Especially— green, leafy vegetables are good for you, and you should eat them, and if you don't want to eat spinach, eat a different one. And that is better for you... I mean, overtly better for you than taking a chlorophyll supplement, or tablet, or liquid, or whatever you want to take. It's— it's— just eat the vegetable. Um, two to three cups of veggies a day. Why not, like— eat more! Eat four cups, eat five cups! Vegetables are good for you.

Um, that is a better way. You get other good stuff that you need, and it might taste a lot better, uh, than taking a supplement that we don't know if it helps you, we don't think but we aren't sure if it can hurt you, and you're paying extra money for when you could just, like, eat a salad, and it would taste good.

Justin: I feel like this— you chose this topic for your ulterior motives.

Sydnee: Obviously since I'm touting the benefits of green, leafy vegetables, it is, I feel like... that we have a lot of medically inclined listeners would point out that if you are taking a medication like Warfarin, which can interact with Vitamin K, which is found in green, leafy vegetables, you should always talk to your doctor, your provider before you—

Justin: Hidden dangers. Is that—

Sydnee: —before you adjust the amount—

Justin: [simultaneously] Is that spinach in your cupboard killing you?

Sydnee: No. No, but you have to know how much you're eating and keep it stable. And people who are on that medication know that and have talked to— you know. But I always feel like if I'm gonna sit here, I'm not gonna say, like, everybody no matter what should eat all the spinach they want all the time. No. There are some people who need to watch the amount of Vitamin K they consume.

Justin: Thank you so much for listening to our podcast. We appreciate you. As always, it's a joy and a treasure.

Sydnee: Yes.

Justin: A pleasure to be here. Not a treasure. That's a weird thing to say.

Sydnee: Thank you all of you who wrote in about chlorophyll. I did not know this was a thing, and it is fascinating that this has become a thing. This is hidden from me on TikTok, I guess. [laughs]

Justin: Yeah.

Sydnee: I've disliked enough of these sorts of videos that maybe they don't get— I don't know. I don't understand the algorithm.

Justin: Find Sydnee on TikTok. She's—

Sydnee: No, don't! [laughs]

Justin: —got a great feed on there. Yes, do! It's classic. You'll love it.

Um, thanks to The Taxpayers for the use of their song, "Medicines," as the intro and outro of our program. And, uh, hey, we got a book! *The Sawbones Book*. It's wherever books are. Go buy it, and that would be— that would be really top notch, so thanks.

And that's gonna do it for us for this week. So until next time, my name is Justin McElroy.

Sydnee: I'm Sydnee McElroy.

Justin: And, as always, don't drill a hole in your head!

[theme music plays]

[chord]

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