Sawbones: Can Black Widow Venom Cure Diabetes?

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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!

["Medicines" by The Taxpayers plays]

Justin: Hello, everybody, and welcome to Sawbones. It's a marital tour of misguided medicine. I'm your co-host, Justin McElroy

Sydnee: And I'm Sydnee McElroy.

Justin: Oh, man, it's such a pleasure to be with you, Syd. We had such a lovely Max Fun Drive, and I want to thank everybody for their support. It really means a lot to us.

Sydnee: Yeah, you all were so supportive. You always show up for us, and we really appreciate it.

Justin: Yeah, so thank you so much if you—if you went over to that URL, maximumfun.org/join. We really appreciate you taking the time to do that. This week, we have a wide variety. You know, I feel like after we ask people to give to us, it's only fair that we give back.

Sydnee: Yes.

Justin: You know what I mean? And by we, I do mean you in this—yeah.

Sydnee: In the form of not medical advice, but answers to your weird medical questions.

Justin: Yes.

Sydnee: But not medical advice.

Justin: As my dad says, it's for fun.

Sydnee: Yes.

Justin: So…

Sydnee: If you—if you are concerned you have a medical condition, please go see your health care provider. Thank you.

Justin: I'm realizing, Syd, I should do a tick check. I need a tick check this weekend.

Sydnee: We both need a tick check. I found two…

Justin: Found two.

Sydnee: On my shoulder. Ripped them off without seeing them, which is not—don't do that.

Justin: Don't do that.

Sydnee: Don't do what I did. But I just, like I felt them, and I knew that's what they were, and I just like, *aah*, I just ripped them off. And then like, I was in the shower, and I just like held them in front of me, like screaming at them, "Aah!"

Justin: *Aah*.

Sydnee: It was just, they're—ticks are upsetting, man. I hate ticks.

Justin: They are. They are. Anywho—

Sydnee: Not as bad as mosquitoes.

Justin: Yeah.

Sydnee: But still bad.

Justin: Mosquitoes are the pits. Listen… Nature's worst killers. Listen—

Sydnee: [titters] We hate mosquitoes here at Sawbones.

Justin: Hate mosquitos.

Sydnee: We are—we are for—right? Aren't we for the eradication of mosquitoes?

Justin: We are for the eradication of mosquitoes. And we talked to bug experts, some of our leading experts—

Sydnee: Entomologists.

Justin: Entomologists.

Sydnee: Mm-hm.

Justin: [titters] Okay…

Sydnee: Well, I think they probably prefer that to "bug experts." I mean, maybe they like "bug experts." I don't know. And that's fine, if you do, but I would assume entomologists is what you would…

Justin: It's like how I call bat experts, experts in these terrifying bugs with wings, with their leathery wings! [chuckles]

Sydnee: Then I would be a… body expert?

Justin: A body—a body and blood and bone expert. A bodyologist.

Sydnee: A bodyo—no… Bodyodyologist. [laughs]

Justin: That's me. An FBI federal body inspector, or a bodyodyologist, if you prefer.

Sydnee: Eh…

Justin: This is a Q&A! So, let's take your questions and pass them on over to Syd, and see what she thinks. Sydnee, "This is one where I feel like I should already know the answer, but it's definitely too late to ask now. If you're upside down and all the blood rushes to your head, could that actually cause lasting damage if you stay that way too long?" What do you say, Syd?

Sydnee: Yes.

Justin: It just says—

Sydnee: [chuckles]

Justin: Whoa, really?

Sydnee: Yes.

Justin: I didn't think you'd say that? I thought you'd say no?

Sydnee: No, the answer—the answer to this question—

Justin: Just like the extreme opposite.

Sydnee: Now I'm going to give you more context, but yes, there is—so, generally speaking, hanging upside down for brief periods of time is not harmful.

Justin: Yes.

Sydnee: Okay?

Justin: Okay.

Sydnee: And what is a brief period of time? I mean, I think that really varies on your specific like physiology, and your underlying medical conditions, and your age and your size, and all kinds of things, right? So like, I can't give you a magic number, but there are routinely people as part

of their like exercise and wellness routines, hang upside down for a couple of minutes.

Justin: Okay.

Sydnee: Are you familiar with that idea?

Justin: Yes, because in like Batman, he slept that way. In some of the Batman movies, Bruce Wayne did.

Sydnee: All night?

Justin: Yeah. I don't think it was probably good for him though, right? Maybe it made him Batman—

Sydnee: No.

Justin: Gave him Batman powers or… I don't know.

Sydnee: I would say that's bad for you to. Like I mean, if we're talking about an eight hour-ish—

Justin: There's no—hey, babe, I don't mean to be all like "um, actually," but like there's no way Bruce Wayne is getting a clean eight hours of sleep at night, ever. He's Batman.

Sydnee: I don't know, he's really rich. And like rich people are able to—they have the privilege that they can afford—

Justin: Right.

Sydnee: The kind of like health and wellness lifestyle that we all aspire to and are told to seek, but then capitalism grinds it out of us.

Justin: Yeah, so—

Sydnee: Bruce Wayne could get it.

Justin: Yeah, that's true. That's fair. Okay. Fair enough.

Sydnee: But he is Batman too. That's fair.

Justin: That's true.

Sydnee: Yeah. So, I don't know. I mean, it depends. And I also will say that if he was sleeping that way all night, even if it's like five or six hours, I still wouldn't recommend it. That would be too long, because he doesn't have like bat physiology.

Justin: True.

Sydnee: He just likes bats, because he got scared of them in a well once, and so now he likes them. Right? Is that the story?

Justin: I'm not going to—

Sydnee: [chuckles]

Justin: Anymore. I'm not going to—I know when I'm being baited, madam, and I won't accept it.

Sydnee: There is, yes, there have been cases of people dying from hanging upside down too long. There are generally circumstances where people have been trapped in some way, where they are hanging upside down, like in a cave. There was an individual who died in a cave, that they were like trapped hanging upside down. There have been people who have become quite ill from roller coasters that have been trapped in upside down posi—so, there's a nightmare for us all. Right? Sorry. Sorry I introduced that idea into our—into our brains. [titters]

Justin: I'm sitting still, so I don't become like an associate to what you're doing right now.

Sydnee: Our—

Justin: What is the—what is this like hor—what is this Final Destination you've queued up for us, Syd?

Sydnee: Our cardiovascular system, everything that pumps blood through your body, is made to be upright, or laying down or sitting, right? But it's not made to work upside down.

Justin: Mm-hm.

Sydnee: So, while we have mechanisms—when you stand up, there is a mechanism that squeezes the blood so that it doesn't pool in your feet, so that it continues to get up to your brain.

Justin: It's wild.

Sydnee: And if—because if it doesn't work, you pass out. It's like a lifesaving mechanism. That's your body's way of saying like, "No, no, no, your brain needs blood! Aah! Fall." Well, there is no mechanism for if you're upside down to keep it from pooling in the top part of your body. It just does.

Justin: Mm-hm.

Sydnee: And so, it's bad for multiple organ systems. Most of the time, the thing we worry most about is the heart. All that blood is pooling in the heart, and overstressing and stretching and overcapacity for what the heart can continue to pump through the body. And you could die of heart failure.

Justin: Mm-hm.

Sydnee: So, that's like the big concern. But the lungs are delicate organs as well. They're on top of everything—underneath them for a reason.

Justin: Mm-hm!

Sydnee: They can get kind of smushed.

Justin: So, the weight of the—

Sydnee: The weight of the other—your other internal organs. The way that your mesentery kind of suspends your intestines, now they're smooshed against your diaphragm, so it's bad for your—it's bad for your gut, it's bad for your lungs, it's bad for your heart. You can have too much congestion of blood in the brain. It's bad for your brain. So, it's bad. It's a—it's a bad—it's, for a short period of time, most likely you're fine. But you should not hang upside down for prolonged periods of time if you can help it.

Justin: There you have it, folks. Straight from Sydnee to you. "Hi, there! Most of my life, I would very rarely get hangnails, maybe once every few months. In the last year, I've consistently been getting them every couple weeks or so. What makes a person more or less likely to get them? Did I make some kind of lifestyle change that unknowingly made them—get them more often?" And that is from Anthony.

Sydnee: Maybe. You might have. So, when I first read this question, I thought, eh, I think they're just kind of random, right? Like you just randomly get a hangnail. It feels like just one of those things that happens.

Justin: And a hangnail, can you define that? Because I used to be confused about what it is.

Sydnee: It's a, well, I mean, it's a piece of either your nail or cuticle that is partially detached.

Justin: Okay. I always used to think it was like if you were trimming your nails, and then you just stopped halfway through. And that's how you had a hangnail, you just like left it—

Sydnee: You could.

Justin: But like, I thought that's what it was. That's what I was envisioning. But it's really a split down the other way.

Sydnee: Yeah, because it could—because, yes, it is a split. You're talking about like running along—

Justin: Yes.

Sydnee: Like parallel to the nail bed.

Justin: Yes.

Sydnee: Or to the direction the nail is growing.

Justin: I'd always imagine—

Sydnee: Perpendicular to the nail bed, yes. Well, you could, but more than likely the nail tore for some reason.

Justin: Mm-hm.

Sydnee: Whether it's because it got caught on something or because you're picking at your cuticles, like I do, that's possible. If you have dry hands, when it's cold, if the skin is dry, if you are not taking good care of your cuticles, if you do pick at your cuticles, there are a number of skin conditions that do make you at higher risk for hangnails. I didn't realize that. I kind of thought it was random.

But if you're not taking proper care of the skin on your hands, specifically if they're getting really dried out, if you're exposing them to harsh chemicals a lot, if you're immersing them in water. So, if you do something where your hands have to be wet, I always imagine like if you're washing dishes all day, or something where you'd be immersing your hands in water a lot. These are all things that can predispose your nails to tearing.

Justin: Hm.

Sydnee: And then you can get hangnails. Yeah, so, taking good care of your hands can help reduce the frequency of hangnails. So, possibly—or sometimes it's just happenstance. Also, don't pick at your cuticles. Do as I say, not as I do.

Justin: Here's one I didn't think I'd be asking you today. "Dear Dr. and Mr. McElroy, can black widow venom cure diabetes? Love the show, Vashti."

Sydnee: Justin, I didn't know this. I learned something. I'm pulling my computer to me so I can tell you exactly what this is. There is something in black widow venom—it does not cure diabetes, so let me make that clear. Let me—let me preface—

Justin: Somebody's like slowly setting the black widow back down.

Sydnee: Yeah, let me preface with this. Please do not intentionally get bitten by a black widow spider.

Justin: Now, this part is this—now, see, I get so confused, Syd. It is this medical advice?

Sydnee: Well, that's just like life advice.

Justin: [chuckles] Because if not—because if it's—yeah, okay, so this is just like regular life advice.

Sydnee: Yeah, life advice. Do not intention—I mean, I… do not intentionally get bitten by something is just standard advi—or like by anything. Right?

Justin: Maybe.

Sydnee: Yeah

Justin: Maybe in some cases. But what about the blood see—like, what about the life saving bite of the leech, perhaps? You can't be universal.

Sydnee: Well, that's not—I mean, generally, it's not life-saving. There are medical—anyway, we're getting lost. This is not—there is no evidence that if you get bitten by a black widow spider and everything else goes well, you'll also have your diabetes cured. That is not—so don't do that.

Justin: Don't do that.

Sydnee: But where does this come from? There's a, it's—I love these things, where there's a grain of truth. Okay, so there is a neurotoxin. We

know that black widows can cause neurological symptoms as part of the whole—

Justin: Right.

Sydnee: Thing that happens when you're exposed to their venom.

Justin: Is there a paralysis of sorts?

Sydnee: It can be—can be lots of different neurological symptoms.

Justin: Okay.

Sydnee: Depending on the dose and, you know, all of that. So, there is a neurotoxin, alpha-Latrotoxin. Okay?

Justin: Okay.

Sydnee: That you can find in black widow spiders. And it is a receptor agonist, which means it will bind with a specific kind of receptor that is already in our bodies.

Justin: Okay.

Sydnee: And there are lots of substances we find that do that. A classic example would be like opium.

Justin: Okay.

Sydnee: We know that—and then all of its derivatives. We have receptors in our body for this substance out in the earth, and this will bind to it. Black widow venom has this substance in it that will bind at those receptors. Do you know what else binds to those receptors?

Justin: What, Syd?

Sydnee: Well, have you heard of GLP-1s, honey?

Justin: Yeah, Sydnee, I have.

Sydnee: Glucagon-like peptide amide, that is also GLP-1, which has been made famous, I think that phrase, because of the GLP-1 class of medications that are used for diabetes, and are now used for weight loss. And so, I think it's become very popular in…

Justin: I think I understand what Sydnee is saying, and so can I just go ahead and wrap up for you here? Sydnee is saying—

Sydnee: Sure.

Justin: That the black widow spider, the bite of the black widow, will prompt you to lose weight.

Sydnee: No. [chuckles]

Justin: And that is stunning.

Sydnee: No.

Justin: And I can't believe that here is where that information is being rolled out.

Sydnee: No.

Justin: Okay.

Sydnee: No, I'm not saying that. I absolutely am not saying that.

Justin: What a tragic misunderstanding.

Sydnee: So, when this binds with that receptor, it could stimulate the secretion of insulin from your pancreatic beta cells. Which is similar to how GLP-1—I mean, that's how GLP-1 medications, and other diabetic medications work, right? Like, the way that we treat diabetes is we either want to make yourselves use insulin more efficiently, or we want to make you make more insulin. So, this is one of the ways we can treat diabetes.

And this has structural homology, meaning they are similar and can bind to these receptors.

Justin: Mm-hm.

Sydnee: Interestingly, there is also a toxin from the Gila monster that is a structural—like, it is the same.

Justin: Okay, folks, you heard it here first. The bite of the Gila monster cures both diabetes and, what, Alzheimer's? What the heck?

Sydnee: No, no, no, no, no, no! So, I think—

Justin: Get me a Gila monster, stat!

Sydnee: I think it's fascinating. And I think what we do with information like this is we look at these substances and think, could we use this as a basis for drug development? We don't say go get bitten by a black widow spider or a Gila monster, because obviously you get all the negative stuff. So, I think we talk about this on the show a lot, that it's not that there aren't cures and treatments that exist somewhat out in nature.

Justin: Mm-hm.

Sydnee: It's that it's not a refined cure or treatment.

Justin: You gotta get something that's a little bit closer to the source, something that's like more refined.

Sydnee: Well, we gotta take what piece of this is working, and let's isolate that, and then make it safe to put in a human body. Black widow spider venom is not safe to put in a human body, even though this one substance might work like a diabetes medication works. So, but I do—I mean, this did, as I was reading it, it felt like the synthesis of like a Black Mirror episode or something.

Justin: Right.

Sydnee: Where people are intentionally getting bitten by black widow spiders and Gila monsters. We do not have evidence that that would in any way help your diabetes or help you lose weight, or do any of those any of those—any of things you may be seeking. Please take medications that have been approved for those. But that is where that comes from, so it is—it is based in some truth.

Justin: Well, there you go, Syd. I'm as surprised as anybody on that one! That did not have the ring of truth to me.

Sydnee: Me too. Me too.

Justin: "A cousin of mine recently had a doctor's appointment that revealed a polyp in her lung and another in her throat. Her doctor said he would order a test on her to determine whether there was cancer anywhere in her body, and then they would let her know the next steps to plan. This news baffled me, but some preliminary searching online by my brother, a nurse, showed us that such a test does exist. How does it work and why have we never heard of it? I'm stunned this technology exists, and assume we don't receive all the tests at our annual physicals due to cost and crappy American medical system. Would love to hear your thoughts, love, Nina."

Sydnee: So, I think this is a really good question, because you'll occasionally see like "full body scans" advertised by health care facilities. The idea being like, just come on in and we'll take a picture of your whole body, and tell you if there's anything to worry about.

Justin: Right.

Sydnee: And it's usually like a cash deal. It's usually not like your insurance is going to cover it, it's just like, "Pay this flat fee, that would be way cheaper."

Justin: It always felt like pay this fee and then walk behind one of those x-ray machines, like on The Simpsons, like Dr. Nick uses.

Sydnee: Perfect.

Justin: [chuckles] Just to take a—see everything in your body.

Sydnee: I don't know exactly what test you were researching. My guess would be a PET scan. And this is a commonly used test. If we find evidence of some sort of cancer in one part of the body, we may at that point want to see if there is evidence that cancer could be anywhere else in the body. And the way we do that is we look for areas in the body of increased metabolic uptake. Cancer grows fast. It eats stuff quickly.

Justin: Mm-hm.

Sydnee: And so, if we see an area on a scan where something's metabolizing things quickly, which we can use with like a radio tracer, and then we look for areas that are brighter than others, is what we're basically looking for, that area could indicate a cancerous growth.

Justin: Mm-hm.

Sydnee: Could. Not 100%.

Justin: Sure, right.

Sydnee: What we know is that this is an area of higher metabolic uptake. And in the setting of someone who we believe already has cancer, that would be very suggestive of a metastasis, right?

Justin: Is that—

Sydnee: We think the cancer's gone somewhere else.

Justin: Is that an indication, though, that you'd need to get more tests? Or is it just sort of like narrowing down the possibility?

Sydnee: Depending on how much information we have at that point. I mean, that's a very individualized question. Have we done a tissue biopsy and we have like, yes, it's this kind of cancer and it originated in this organ, and now we're going to look to see like these are likely metastases in these other places? Or do we really have no idea what's going on here, and we're

using this as a tool to try to refine where are the problem areas, and can we get a piece of tissue from there?

Justin: Right.

Sydnee: So, it's very individualized. But my point is this, to just randomly put somebody in a PET scan would not necessarily tell you anything.

Justin: Mm-hm.

Sydnee: If I don't have some sort of clinical indication, like why am I doing this on you? What did I find that made me think that? So, it's one piece of information, but it is not diagnostic for 100% this is cancer, first of all.

Justin: Okay.

Sydnee: It does not tell us that. And in the setting of no other information, no other testing, it would be maybe a dangerous test to do. In the sense that if I see an area of increased metabolic uptake, am I going to biopsy it because I don't know what it is?

Justin: Maybe.

Sydnee: Maybe. Well, probably, because at this point, I've kind of hemmed myself in. And this is the same if you think about like, "Why don't you just stick me in an MRI? Why don't you just stick me in a CAT scanner? Why don't you just look in my whole body and see if there's anything in there?" We might find a lot of things that are not the like… the standard what we see in a human body every time.

Justin: Right.

Sydnee: But for you, it may be completely normal. We have a term sometimes we use called incidentaloma.

Justin: Incidentaloma?

Sydnee: It's some sort of oma. Oma is sort of the like, the ending that's on a lot of masses that we find. And it was an incidental finding. "We were looking at something else, and incidentally, we found this adenoma," or whatever. So, it's an incidentaloma. Most of the time, it can mean nothing.

Justin: Yeah.

Sydnee: But once we find it, we're going to start doing tests on it.

Justin: You have to, right?

Sydnee: Yes.

Justin: From a—from a liability standpoint, if nothing else.

Sydnee: And these scans may be external, non-invasive, and in a sense, low-risk. Although, for some of these, there's radiation involved, we may be putting dye in you, so there is some risk involved. But even if all of that risk is pretty low, it might lead us to do higher risk procedures.

Justin: Mm-hm.

Sydnee: To try to figure out what's going on. And at that point, you are risking that you went down this whole pathway when you were well and really didn't need any testing.

Justin: Mm-hm.

Sydnee: And now we've done things to you that could cause harm, unnecessarily.

Justin: Yeah.

Sydnee: So, this is why we don't typically—there's no evidence right now to recommend full body scans to look for anything. And we do not have a single test that I can use on you and then immediately say, "Yes, you—I saw this thing on an image, and I know for sure it's cancer." We can highly think like, "Yes, this is very suggestive."

Justin: But.

Sydnee: But until we look at that tissue under a microscope, we don't know for sure. And so, we might—we might be going—barking up the wrong tree, so to speak. So, that's—I think that's the test you're talking about, and I think it's a good reason why we don't do whole body scans all the time.

Justin: Let's take a quick break there. I actually have already prepaid for one of those scans, so I have to get that done, and pay for it. And then I'll be right back, and we'll do the next half.

Sydnee: Then it's good that we're going to the Billing Department. [chuckles]

Justin: Yeah, we'll need it. Let's go!

[theme music plays]

Justin: You know, I sometimes will forget that hunger exists. I'll sometimes forget that I get hungry. I'll forget about all of it until it's too late and then it's like, "*Aah*, I'm freaking out! I gotta eat right now." Luckily, that's where Factor comes in. They have meals that are going to come to you, they'll be ready in about two minutes. And they are going to taste like a delicious, real meal. Not something you smooshed together yourself from whatever like base components you can find.

It's going to be real food, you know, delicious stuff. I wish you could see some of the salmon and sweet potatoes I'm looking at right now. The shrimp, the broccoli, it's real! Real stuff that you could be really be enjoying. And they're built around whatever kind of way you want to be eating. Whatever your nutrition goals are, you know, Factor's got some cool options for you.

And they have different flavor profiles too, they got some Mediterranean, a little bit of Asian in there. Over 100 rotating weekly meals, so you got a lot of choice. Head to factormeals.com/sawbones50off. And use code

"sawbones50off" to get 50% off and free daily greens per box, with new subscription only, while supplies last, until September 27th, 2026.

I'm wearing a pair of shorts right now that I love. And I don't always spend money on clothes for myself. It's always been kind of a low priority for me. Mainly because I hate spending a bunch of money on something that I don't know, you know, that I'm going to wear out in the world. But Quince is a really perfect balance of that for me. And things cost very reasonable prices, but they look great.

Like, for example, if you want to see what I'm talking about, go to Quince, check out some of their spring stuff. Talking 100% European linen shorts and shirts from 34 bucks. Lightweight, breathable, comfortable. Get a couple pieces from 'em! See what you think, okay? I think you're going to be impressed with the quality that's there. They also work directly with ethical factories, and they cut out the middlemen, so you're getting good stuff at a really fair price.

My corduroy shorts are my personal favorites, but I've gotten literally probably 15 things from Quince, and I love them. Refresh your every day with luxury you'll actually use! Head to quince.com/sawbonespod for free shipping on your order and 365-day returns. Now available in Canada, too. That's quince.com/sawbonespod for free shipping, and 365-day returns. Quince.com/sawbonespod.

[break]

Advertisement: Thank you to all the Max Fun Members for supporting us during Max Fun Drive. You're helping us as we try to put more good into the world. And as part of putting more good into the world, we've opened our annual Cost Drive charity sale. Max Fun Members at $10 a month or more can purchase Max Fun Drive keychains, featuring designs for shows across the network.

And all members can buy our charity-exclusive keychain starring Micey, our little microphone buddy from this year's Max Fun Drive. This year, we've decided to send the proceeds of the charity sale to the Center for Constitutional Rights.

They're dedicated to the creative use of law as a positive force for social change, tackling issues like human rights abuses, racial injustice, and sexual and gender-based violence. These folks are fighting to make things better. So to get your keychains, and support the Center for Constitutional Rights, head to maximumfun.org/charitysale.

And if you're not yet a member, you can still get in on this. To support the show you're listening to and get access to bonus content and the charity sale, just click the link in the show notes. The sale is live now, and it ends on Friday, May 15th. That's maximumfun.org/charitysale. And thanks gain.

[break]

J.Keith: Say, what's the trivia show where dreams come true?

Helen: It's got to be Go Fact Yourself!

[applause]

J.Keith [live]: Legend in the house!

J.Keith: We quiz celebrity contestants about topics they love!

Helen: Then bring out surprise experts!

J.Keith: To delight and amaze.

J.Keith [live]: And then finally, tell us why you know and love the lyrics to the song "Knockin' Boots" by Candyman.

Helen [live]: Joining us tonight is a rapper and producer, it's Candyman!

[applause]

Guest 1: Oh, Candyman!

Guest 2: This is among the greatest moments of my life.

[audience laughs and cheers]

Guest 3: This is one of mine too. I love it.

Helen: That's Go Fact Yourself!

J.Keith: Twice a month, every month.

Helen: Here on Maximum Fun!

[break]

Justin: Good news. Practically perfect in every way. Believe it or not, that's what they said.

Sydnee: Mm-hm. Mm-hm.

Justin: "I've been taking omeprazole, O-T-C—" Got that in one because we do say that around the house. [laughs]

Sydnee: Yes, we do.

Justin: [chuckles] "Omeprazole daily for a couple years now to treat my heartburn and acid reflux. It seems to usually be sold in packs of 14, one pill daily, as a two-week treatment. But as soon as I stop taking it, my acid reflux comes back with a vengeance. So, I just keep taking it every day. My mom has also been taking it for years. Recently, she was having blood work done and the phlebotomist said they stopped taking omeprazole because they heard it causes loss of bone density, and can accelerate conditions such as osteoporosis. Is there any truth to this? Thanks. Love the show, Jo."

Sydnee: This is a really great question because I, for one, I know anecdotally that *a lot* of people take omeprazole or medications like it. They're in a class called proton pump inhibitors, or PPIs. I'm going to use that for short, PPIs.

Justin: Yeah, thank you. Because every time we say proton pump, I get excited that it's a Ghostbusters thing and it never is.

Sydnee: It's not. It's definitely not. So, this class of drugs, when it was developed to treat acid reflux, as it is colloquially known, when it was developed, the thought was that it would be a temporary short-term treatment for the majority of patients. Now, there will be some outliers who have maybe some other chronic or genetic conditions that they need it chronically. But the thought was that this would be a four to six-week treatment, usually six weeks, for either acid reflux or peptic ulcer disease, something like that. And then you would stop it. They were not created for chronic use.

Justin: Yeah.

Sydnee: But that is not the way that the American public, at least, has embraced it.

Justin: Mm-hm.

Sydnee: We know that it is probably overprescribed. And then because it is over-the-counter, we probably are using it more than is really necessary.

Justin: Mm-hm.

Sydnee: And so, now we are starting to do these what are called observational studies, meaning, well, we thought that you would take this medication for a few weeks, but now you've taken it for a few years, and I don't really know what that's going to do.

Justin: Right.

Sydnee: So, observational studies have shown association, this is not causation, but association with increased fractures, cardiovascular disease, dementia, chronic kidney disease, some mineral and vitamin deficiencies. So, there's a lot of different things that we have seen. If we—if we look at a study of these people take PPIs and these people don't, we see a higher rate

of this in this population than that. We don't know if that means they're causing it right now.

Justin: But there is a—some sort of correlation.

Sydnee: And we do have some conflicting data. There's some data out there that says like, well, yeah, they might decrease your calcium, but they don't actually cause an increased risk of fracture. We don't have that. So like, right now, we don't know for sure. We see some association. But the problem with these medicines is that if you take them for more than four to six weeks, you'll get rebound acid when you stop them.

Justin: Oh, right, so, it—even if—so it feels…

Sydnee: You're going to feel like you need them forever, whether you do or not. So, it's really hard, if you've taken them for a while—and I am not suggesting right now that I know you need to stop them. I don't have data to say that.

Justin: Mm-hm.

Sydnee: Please talk to your health care provider. But if you are going to consider trying to stop them and seeing if it—if it is good for you—

Justin: Yeah.

Sydnee: You need to know that when you first stop them, you're going to have worse acid reflux than you had to begin with.

Justin: Mm-hm.

Sydnee: And you're going to need to take other things to help cope with that until that sort of flushes out of your system after a few weeks. And then it kind of equalizes and you see where you are.

Justin: A few weeks?

Sydnee: Yeah. Now, that's why it's so hard for people to stop them, is because of that rebound acid reflux. And I totally understand, there was a period in my life where I had to take them a lot. But again, talk to your own health care provider. But that's the problem with PPIs. We didn't intend for them to be forever use, but that is definitely how the American public has embraced them.

Justin: I really—I feel like that's kind of my relationship with ibuprofen too, which I didn't even realize was something that you should do for a short run and then bail on.

Sydnee: Yeah, there are a lot of—that's the problem with over-the-counter meds and like that—I think we have created this block in our brains that if it's over-the-counter, it's safe to take whenever we think we need it. And if it's prescription, then that's when it needs to be regulated. Over-the-counter meds can be dangerous if not used appropriately. And so, if you find yourself having to take over-the-counter meds all the time, it's at least worth a conversation with your health care provider like, "Hey, is this cool? Like, I do this every day. Is this okay?"

Justin: Right. "Is this all right?"

Sydnee: Because there are alternatives. There are other medicines for acid reflux that aren't PPIs, that you may be able to—that may control your symptoms, and you don't need to take a PPI. So, at least ask.

Justin: Just ask! It never hurts. "Hey, Sydnee and Justin, I have a quick query for you two. Why did the Black Plague end? And are there other plagues humanity was able to end pre-vaccine/antibiotics? I've heard that survivors gained immunity to the plague, causing the spread of the illness to slow, but didn't this happen—why didn't this happen with other plagues?" That's from Eric.

Sydnee: Well, it did. I mean, that's—

Justin: Yeah, because we're not still having them, right?

Sydnee: Right. I mean, that's the thing, we do—I mean, some illnesses, epidemics, outbreaks, plagues throughout history are better publicized. Because I think, honestly, the ones that we know the most about are either ones that have very obvious and dramatic physical presentations. So like smallpox springs to mind.

Justin: Right.

Sydnee: And plague is another good example. You could get giant buboes in your armpits, right?

Justin: Sorry, say it again?

Sydnee: Buboes.

Justin: [titters]

Sydnee: Big, black swollen lymph nodes. But the other thing is that they kill a lot of people. Those are the things that stand out. There are plenty of things that maybe don't get as much press, but also had an impact on human history. Before vaccines, we just got 'em. Now, of course there is no vaccine for the plague, we just treat it now.

Justin: Yeah.

Sydnee: So, before vaccines, before antibiotics, we got them. And some of us lived, and some of us died.

Justin: Yes.

Sydnee: And those who lived hopefully developed immunity, depending on what it is.

Justin: Or they had children whose children's children's children's children's made vaccines.

Sydnee: Yes. And those who didn't, that was it. And you know, that's—I think we kind of take it for granted because we don't see this now. Well, yet.

Justin: Yet.

Sydnee: But yeah, that's the thing. No illness that we know of… I feel like I should knock on wood when I say this, kills 100% of people who get it.

Justin: Mm-hm.

Sydnee: There's some that come pretty close.

Justin: Yeah.

Sydnee: But there's going to be survivors. Now, that is not an argument for "so let it—let it burn." Personally, I went into medicine, so I don't know why I would make that argument, but they do. I mean, I think—I think what you're talking about is exactly what happened pre-vaccine, pre-antibiotics.

Justin: Mm-hm.

Sydnee: Some lived and gained immunity, and were able to pass on their genetics to the next generation. And sadly, many, many didn't. And now, we have vaccines, and you should get them.

Justin: "I recently gave birth. And in my discharge instructions, it said to flex my calves six times a day. I thought this might have to do with circulation after being in bed for three days, but then I read it on a pregnancy website that flexing the calf muscles improves bladder function. They called it a biohack. Is this true? If so, how does it work? Thanks, Mary."

Sydnee: You were right, Mary. I don't know what the connection between calf muscles and bladder function would be. I tried to—I tried to find if there was any sort of like—a paper published on this that somebody was investigating or something, and I couldn't find that. It is good advice, regardless. And it is your circulation, so, you were—you were spot on.

Your risk of getting a blood clot, a deep vein thrombosis, a DVT, after pregnancy is increased, specifically in the postpartum period. It is during

pregnancy as well, but in the postpartum period, those first three weeks is a much increased risk. And then six—up to six weeks after delivery, increased risk of blood clot. So, doing things to prevent a blood clot from forming in your legs is a good idea. Getting up and walking around is—

Justin: Good!

Sydnee: One option.

Justin: But it's tough when—if you've just delivered a kid, especially if you had a C-section.

Sydnee: Exactly. So, there may be reasons why you're not up mobile as much as you would be. So, flexing your calves is another way of creating circulation, blood flow, and trying to prevent a DVT. So, that's a really—I think that's a good piece of advice. And also like your body has just been through a traumatic, stressful event, and light exercise that you can tolerate, like flexing your legs while lying down, is a good idea. So, you were right.

Justin: "Okay, so not really a weird medical question, but recently I've heard multiple people go to their clinics and have doctors or PAs ask if they could use AI scribes. What is the security around these and how common are they becoming in the medical field? Because they honestly freak me out, and I have to go past my comfort level to say that, no, I won't allow it." That's from Emily.

Sydnee: I think this is a really timely question. So, I don't use the AI scribes, but I know—I have many colleagues who do. The agreements that are being signed with these AI tools protect you, the patient, from data sharing, right?

Justin: Right.

Sydnee: I mean, that would be the understanding, is that this ambient listening device is going to hear things, generate a note, but will not be creating its own database, I guess?

Justin: Yeah.

Sydnee: Of information about you. And then certainly, we would not as a healthcare organization then be allowed to share that information with all of the people who want data, like Amazon or whatever, right?

Justin: Right.

Sydnee: Like whoever buys data to sell you things better, because that's generally what they're doing. All of those agreements are put in place. That being said, as we increasingly engage with AI in healthcare, I definitely see this as a place where there will be security issues. I mean—

Justin: 100%.

Sydnee: It's hard for me to imagine that we won't see breaches in this process periodically, where people's data is released to third parties, intentionally or unintentionally. Where healthcare offices and doctors are maybe the subject of lawsuits based on this technology.

Justin: Mm-hm.

Sydnee: And I really feel that the real pain point is, right now, AI is being used a lot to generate the note, and there's a lot of arguments for it saves your doctor time, they're more efficient, they're less likely to burn out if they don't have to write the note, if the AI writes it for them. But on the flip side, there's also increasingly technology that would actually diagnose and treat the patient for you.

Justin: Boo.

Sydnee: And in that case, who's on the hook if it's wrong?

Justin: Mm-hm.

Sydnee: Is it—is it—if I am using it as the physician, is it me, because I use the AI technology? Or is it the creator of the AI technology? Is it my healthcare organization that purchased it? Who's on the hook for that?

Justin: I don't know.

Sydnee: I mean, that trial will come, right? Like, that case law will be written, if it's not already in process. So, I would say, right now, the use of AI to generate the note is not—I don't think it's particularly controversial in healthcare. I mean, Justin, don't you think a lot of people are using AI for a similar idea?

Justin: Yeah, I—

Sydnee: Record this conversation and turn it into a document?

Justin: Yeah, and I think that AI is going to mean a lot of different things in a lot of different contexts. I think a lot of the AI that's being advertised to people is going through a lot of the big tech companies, and to their servers. Things like, you know, Gemini and Chat GPT and all those services. You know, it… I understand why they would be, you know, guaranteeing security and safety and stuff.

And guaranteeing that this data wouldn't be used to train the models. But I don't—I don't know that I would buy it, honestly, I just wouldn't believe it. [chuckles] If it was—if it was me, I would say no, I don't—I don't—I would rather you just, you know, I don't know, wrote it down or something. [chuckles]

I don't—I don't necessarily need an AI scribe listening. I don't know. Sorry, just to add, there have been recently like stories in tech companies of AI working in environments that should be more secure, that like took it upon themselves to delete information, release information, *whatever*.

Sydnee: Well, I heard a… or I read one, as I was looking into like the legal issues around it, how are you protected? And one interesting question in this is, if you are in a state that requires consent for recording, your provider has to ask you. If you think about it.

Justin: Yeah.

Sydnee: And so, that's going to have to be written in there, so that you are going to have to have a conversation if you're in a state where that's not allowed. Now, in our state, it would be allowed.

Justin: Yeah.

Sydnee: So I wouldn't have to ask my patient if I was going to use this technology. I could just use it. I still think it would be a smart thing to do. I will not use it, because I think that the more we have used computer generated notes, pre-AI, just the computer-generated note skeletons that we use a lot in EMRs, electronic medical records, I think put so much trash in our notes, so much just ridiculous—

Justin: Cruft.

Sydnee: Yes, stuff, that they make our notes almost unreadable. And since I do chronic care for patients, and I am the main person who needs to read those notes in the future and understand what was past Sydnee doing, what did we decide and what were we doing moving forward? I write all my notes. I free text.

I might use an algorithm to like plug in symptoms, but when it comes to the story and the plan, I free text all of it, because I think my notes are higher quality for future healthcare providers to read and understand the plan for the patient.

So for me, I think I get better quality and my patient gets better quality from free texting my notes, and I will stick to that, and I'll just live with it. But I am also in a privileged position because I have great support from my boss and my healthcare organization, and they do not overload me with patients to a point where I would have to use a tool like that to survive.

And many of my colleagues have to, or else they cannot finish their work, period, like ever. There is not enough time. They could go without sleeping, eating, peeing, and they still would not be able to keep up with the load of work that doctors are being asked to perform these days.

Justin: I'll say, the healthcare system sucks and there is very little about AI that is going to make it less sucky. [chuckles]

Sydnee: Yes.

Justin: I think it'll just allow it to suck more for longer.

Sydnee: They want to churn more work out of each provider, and this is a great way to try to churn more work out of us, and try to convince us that they're helping us.

Justin: "I was wondering about how many living human cells would be shed when you, well, poop. I suspect it would be a small number, but I also suspect it wouldn't be zero." I don't want to talk about this.

Sydnee: Let's talk about poop, Justin. Mark wants to know, how many living human cells are in poop. You got a guess?

Justin: 80.

Sydnee: 10 million.

Justin: Okay.

Sydnee: 10 million colonocytes, like the cells that line your colon.

Justin: Colonocytes.

Sydnee: Epithelial cells that line your colon. They're about 10 million. However—

Justin: We're not doing this one.

Sydnee: There's a hundred billion living bacterial cells in your feces, so—

Justin: Wow.

Sydnee: Your poop is more bacteria than human.

Justin: God, this shows sometimes, man…

Sydnee: We got one more.

Justin: "Hi, Sydnee. I am 24. I have my first cervical screening coming up and my period has come at the most inconvenient time. How important is it to not be on your period for this procedure? I've heard people say it's better to have it in the middle of your cycle, but that seems tricky to attempt to get an appointment with such specific timing. And it made me wonder just how much the phase of your cycle affects the results of a cervical screening and why." That's from Kat, them/them.

Sydnee: So, I think this is a really great question, because the data on this has kind of changed over time. So, initially we did used to counsel patients that prior to their cervical screen, or pap smear you may call it, prior to your pap smear, it was best if you were not actively bleeding, like having your menstrual cycle.

The thought was that the cells, the blood cells would interfere with when we're trying to put those cervical cells on a slide and look to see any evidence of like pre-cancerous changes or cancerous changes, that the blood cells would get in the way and interfere with the sample.

And I think that is theoretically still a possibility. I'm not going to say there couldn't be a sample where you would see it and there would be so many blood cells that you wouldn't get a clear picture. That is theoretically still possible.

Justin: Okay.

Sydnee: That being said, one, we had, I found a study out of 2025 that looked at patients receiving a pap smear while actively bleeding on their menstrual cycle, and those who didn't, and they did not see any difference in sensitivity and specificity of the pap smear in those two patient populations. And this is just from last year. So, maybe we were worrying about nothing.

Justin: Mm-hm.

Sydnee: The other reason that we have pushed back against this through the years is that it is really hard to get a timely appointment to get the screening done. We know that, especially in this country.

Justin: Mm-hm.

Sydnee: And if we don't do it at the moment that you're there, there's a high likelihood we lose you, and you put off your screening for a while, and maybe we lose this opportunity to catch something in an early stage.

Justin: Mm-hm.

Sydnee: And save your life. And by the time we catch it, you're in a later stage, and then something tragic happens. So, the stronger recommendation is, go ahead and get it done. Most of us won't reschedule. Most of us will just say, "Meh, I'll get to it at some time." And you won't. And it's better to get it done. And worst case scenario, even though I've never had this happen, it is theoretically possible that we go, "Eh, it wasn't a great slide. We maybe need to do it again."

Justin: Mm-hm.

Sydnee: I've never had this happen, but I'm not going to say it's impossible. But most likely it will still be a great sample, and a good test, and you'll have your screening done. Could it be uncomfortable? That's the other issue. Yeah.

Justin: Yeah.

Sydnee: I mean, as somebody who menstruates, yeah, I would prefer not to. And I will say, full disclosure, I have put off a pap smear, because of my cycle, because I did—I just didn't want to go through it. But I also am privileged that I have access to my OBGYN. I can text her or call her and say, "Hey, when can I get in to see you to reschedule this?" And I can do that really quickly. If I did not have that access—

Justin: Did you reschedule that already?

Sydnee: Yes, I did. If I did not have that access, I would just get it done. And that would be my advice to most patients. Unless this is—obviously, if you're going to be traumatized, and if it's super uncomfortable—I mean, I'm not—I would never encourage you to force yourself to go through with something. But for most of us, just go through with it. I promise you, as someone who has performed many pelvic exams and many pap smears, I am unbothered.

Your provider will not care, will not notice, will not—it will not even cross their mind that you're still having a period. It will not bother them. You may be uncomfortable, and that's totally valid, but your provider will not care. I promise you. [chuckles] There's nothing we haven't seen or tackled. It's nothing.

Justin: Thank you so much for listening to our podcast. Thank you to everybody that supported us in the Max Fun Drive, really appreciate it. Thanks to The Taxpayers for the use of their song "Medicines" as the intro and outro of our program.

A quick note, just to remind everybody, these Q&A episodes sometimes remind me, Sydnee is S-Y-D-N-E-E. I know that she would never get upset about it or saying anything, but I love her and she makes me really proud. So, that's how you spell it—

Sydnee: Does that bother you?

Justin: S-Y-D-N-E-E, it does, because you're my—you're my favorite, so—

Sydnee: Well, it doesn't.

Justin: It doesn't bother me, but it is an unconventional spelling. And I've been talking a lot about names recently, and I think it's important. S-Y-D-N-E-E.

Sydnee: It's ultimately my parents' fault for spelling my name the way they did, I think.

Justin: And where did they get that one again, Syd?

Sydnee: They got it from a Playboy centerfold named Sydne Rome. Although, to be fair, I bet you anything Sydne Rome, spelled it S-Y-D-N-E-Y.

Justin: Really?

Sydnee: Because I bet it was Sydney, Rome. Like Sydney, Australia and Rome, Italy. I bet you anything it was spelled that way.

Justin: Oh, that's like the pun. Honey?

Sydnee: S-Y-D-N-E?

Justin: One E. [chuckles]

Sydnee: Holy crap. And our birthdays are only 10 days off. I mean, not year, but date.

Justin: There you go. Wow.

Sydnee: S-Y-D-N-E.

Justin: Now, that would have been—okay, now, straight up, what would you—I mean, what would you prefer? [chuckles] With the one E, no one would ever get that, right? You'd probably have to stop everybody for that. But yeah, I thought it was S-Y-D-N-E-E this whole time. I've been telling people that you've been named after this person your entire life.

Sydnee: Wow. Her name is often misspelled S-Y-D-N-E-Y or S-I-D-N-E.

Justin: Even on—even in tribute names—[laughs] it sometimes it's spelled S-Y-D-N-E-E.

Sydnee: Isn't it wild? This is the first time I've ever googled her. I have never googled her until this moment.

Justin: What an episode. What an episode, what a moment.

Sydnee: This was fascinating—

Justin: Thank you so much for listening. [chuckles] That's going to do it for us this week on Sawbones. Until next time, my name is Justin McElroy.

Sydnee: And I'm Sydnee McElroy.

Justin: As always, don't drill a hole in your head.

["Medicines" by The Taxpayers plays]