Sawbones 469: Blood Glucose Tolerance Test

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

[theme music plays]

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

Sydnee: And I'm Sydnee McElroy.

Justin: Ugh...

Sydnee: You okay there, Justin?

Justin: Ah, you know, Syd, jet lag. I'm jet lagged, I was out on the west coast.

Sydnee: [sarcastically] Jet lag, it's so tough.

Justin: Yeah, thank you.

Sydnee: [sarcastically] Flying back and forth across the country doing shows.

Justin: There is nothing more exhausting than jet lag, except maybe watching our children without me around. [laughs]

Sydnee: Mm-hmm. Yeah. Solo parenting, running the household, going to work, taking care of a sick kid... She's okay now, by the way.

Justin: Thank you. Where were you all when she was sick, though? That's my question.

Sydnee: [laughs] Where were you when I needed amoxicillin for an ear infection? Not me, but our child. Anyway, all is well. Um, Justin, we're not talking about Burning Man this week. That is not what we're talking about.

Justin: That will be the first time since I've been back that you have not been talking about Burning Man, so imagine my surprise.

Sydnee: I do want to say, I feel like for posterity, I want to get this on the record that I feel like there's probably a future episode that may come. If you're not following what's going on out at Burning Man, which is this— I don't even know. It's a big art festival, music, art, whatever. Live your truth festival out in the desert.

Justin: Yeah.

Sydnee: I don't know. I've never been. But I've watched documentaries about it. Uh, but anyway, it rained and they're on these— They're in this, like, ancient dried up lake bed that's made of, like, alkaline dust.

Justin: Yeah.

Sydnee: And then it rained, which I guess it, like, never does there. And so now it's this sort of mud that no one can move in. You can't walk in it, you can't drive cars in it, you can't ride bikes in it. So everybody's just kind of—

There's, like, 70 thousand people stuck there. Although, I guess a lot of people have, by now, hiked out the five or six miles out in the mud to the road to hitchhike back to, like, towns.

Justin: Every few minutes, Sydnee will just be in another room and I'll hear, "Well, another truck got stuck!"

Sydnee: It's wild to see. The reason it interests me from Sawbones, and this is why I think maybe there's a future episode here. So, I'm put— Again, I'm going on the record. It— So this stuff isn't like regular mud. It's like a salt flat. It's really alkaline, it's the opposite of acidic, right?

It's really basic. And it, like, the PH is nine or ten or something. So anyway, if you get it on your bare skin for long enough, it can cause kind of, like, chemical burns almost.

Justin: Okay.

Sydnee: Like, it draws all the moisture out of your skin and you can get big cracks, like...

Justin: [disgusted noise]

Sydnee: ...opening— Right? Because your skin gets super dried out and a bunch of people were walking around barefoot. And what I started looking up is what kind of bacteria specifically thrive in alkaline environments, because there are bacteria— Like, we used to think, like, most— And most bacteria like neutral environments, you know.

Justin: Mm-hmm.

Sydnee: Like the PH in the middle. Some like really acidic, some like really alkaline. The ones who like really alkaline that might survive out in the salt flats, now there's all these cracked, open feet wandering around... There may be a really unfortunate, but interesting episode of Sawbones.

Justin: Oh, gosh.

Sydnee: Pending.

Justin: This is grody, I got to be honest.

Sydnee: My— I— No one at Burning Man can hear me because they're stuck there but, like, please don't walk around barefoot. Please don't. [laughs] Moisturize a lot when you get home.

So anyway, I just want to go on the record and that, uh, because several people were, like, have already actually emailed to say, "Is this a topic?" And I'm not sure yet. But I'm digging in to it. There may be. There may— I'm watching the...

Justin: Trust me. If the amount of time Sydnee is spending following the proceedings at Burning Man is any indication, she will find a topic.

Sydnee: I just thought it was regular desert. I didn't know it was a salt flat. That's a whole other— I just didn't know that. I missed that detail. Anyway, um, we're monitoring the situation closely here at Sawbones.

Justin: [laughs] Here at the HQ, we got the news desk is all over it.

Sydnee: Yeah. Um, I hope everyone's okay. I do not wish anyone ill will. I am sorry that I'm fascinated by it, because that makes it seem like I'm detached and inhuman. I do hope everyone is okay.

Justin: Yeah, uh, you would hope that goes without saying, but now you've said it, so... [crosstalk]

Sydnee: Yeah, I do not want anyone to suffer, but I am watching to see what will happen. Um, we're not talking about that. There was another issue, there was a lot of discourse on Tiktok about this past week and, Justin, probably not on yours. I get a lot of, like, medical Tiktok. Some of it is because I've, um, I've messed up my algorithm permanently for all of you.

Justin: [laughs]

Sydnee: Um, some of it is, like, fake medicine, Tiktok stuff, and then other is, like, people calling out fake medicine stuff.

Justin: Mm-hmm.

Sydnee: I get a lot of that. Which is always interesting, because then it kind of alerts me to something new and weird that's out there and there has been this discourse about the oral glucose tolerance test.

Justin: Yes. I remember that.

Sydnee: Lately— Yes. Um, the idea being that— And if you've ever been pregnant or if you're familiar with this test from a healthcare perspective or because you know somebody who's been pregnant, basically it's a— And I'm gonna walk you through it, but it's a test we do to look to see if somebody has or is at risk for gestational diabetes, meaning...

Justin: Right.

Sydnee: ... developing diabetes while pregnant.

Justin: I remember this test because you thought it was really gross.

Sydnee: Yes.

Justin: The stuff that you had to drink, it yucked you out.

Sydnee: Yes. And right now, the discourse is calling into question both the need for the test and then the method that we use to perform it, specifically how we go about it and if it's really necessary. Um...

Justin: [yawning] Okay.

Sydnee: Just to walk you through it real quick before I tell you why it is necessary and why we do it the way we do it, um, because that's my thesis statement. [laughs]

Justin: Right. [laughs] Not to spoil it.

Sydnee: Yes. Let me just say that at the beginning. Um, if, uh... Okay. So if you have certain risk factors, this can be a little different. Like, we screen you, first of all, based on history. Like, when do you need to have this test done and will you have one or two tests and all this stuff.

And then the other part is what your result is from the test, whether or not you have another one done. Um, just to kind of give you an example, um, our first child was really big. [laughs]

Justin: I mean, there it is. There's no nice way of saying it, it was a big baby.

Sydnee: Yes, she was a big baby. So big that, uh, it— We ended up with a C-section, um, and so my second pregnancy, my doctor decided to go ahead and screen me earlier for gestational diabetes based on the idea that, even though my tester and my—

I got all my screening in my first pregnancy, I followed all the rules, but, uh, it said I didn't have it. But then, he was kind of, like, "I don't know. Did we miss it? Your baby was really big, maybe we should check... Put you in a higher risk category, basically, and stratify you a little differently based on that." And I still tested negative, so I still didn't have it. I still did have another very large child, so I just have large children.

Justin: She was— Cooper wasn't, uh— I guess she was pretty big.

Sydnee: They were both over nine pounds, honey. Those are big babies.

Justin: Yeah, big babies.

Sydnee: Big babies. Anyway, so when you're having the test done, the regular one hour glucose tolerance test, this is what everybody is gonna have done if you, if— I mean, if your doctor orders it, you should have it done between 24 and 28 weeks of pregnancy.

Uh, basically the morning of the test, you go to the lab. You drink a glucola solution, so it's specifically a solution made of 50 grams of glucose. There

are different kinds of sugar, right? There's fructose and sucrose and there's all kinds of sugars. Glucose is what you drink in this test.

Justin: Yes.

Sydnee: Okay? Um, yes, it is— The one that I...

Justin: Ose are the sugars, right? Ose? Oses?

Sydnee: Ose, right. Yep. The one that I drank was orange, um, I think there are other flavors. I did not enjoy it. I don't— I've never heard anybody say, like, "loved that glucola!" I mean, it just— It's an incredibly sweet— It's just sugar, it's just pure sugar...

Justin: Kids would probably like it.

Sydnee: Orange sugar— Oh, our kids would love it. Um, I found it difficult because I also was a little nauseous that morning and so, you know, it's unpleasant. But anyway, after 60 minutes, they check your blood glucose level.

They have, like, an expectation that your body should be able to tolerate that glucose load, like, get it out of your bloodstream and into cells where it can be used for energy. Um, and so if that level is under 140, and this cut off, by the way, can vary a little from doctor to doctor. Like, if you go to a different medical institution, you might find them say 135.

There's a little bit of variability there. But generally speaking, if the level's under 140, then your body handled glucose the way we expect it to. If it's over that, then you may have gestational diabetes and we may need to do further testing.

Um, and then further testing is the three hour glucose tolerance test, which is very similar, except for you drink the— First, they bring you in. They check your fasting blood sugar, meaning no food. Then you drink the stuff and then they check it at one hour, two hours, and three hours. And they

have cut offs for all of those, what should a fasting blood sugar be, what should a one hour, a two hour, and a three hour.

Justin: Got it.

Sydnee: Right? Okay. Same idea, except for that one was 100 grams of glucose. But same idea. All of this along with, you know, an appropriate history and physical exam and everything, can help your doctor decide if you have gestational diabetes and then can help you manage it if you do, right?

Um, we've talked about diabetes before and I'm not gonna get into, like— Because we have a whole episode on diabetes and how we've known about diabetes since ancient times. We have described things that we now call diabetes mellitus.

Justin: It's an old one.

Sydnee: Yes. Um, gestational diabetes is a little more recent and I think it's important to talk about how we figured it out because it helps us answer the question— Let's say that you listen to some of these people on Tiktok who are urging you either not to get the glucose tolerance test or to do it your own way.

That's what I'm starting to see are people who are saying, like, one, you just shouldn't do it. It's unnecessary. Um, and this is, like, a nuanced topic. They're accusing doctors of medicalizing birth unnecessarily. We're intervening with something that is a natural process and we should leave it be.

And to some degree, I understand that concern, having gone through two pregnancies. There are a lot of times where you just feel like, "Oh, my gosh, why are we, like, why do I— The birthing process, why do I have to be strapped to a bed on monitors on my back if things are progressing as expected and there are no complications?"

And so there are lots of, like, ways we could debate different aspects of the way we manage pregnancy and birth and why its different all over the world.

And outcomes are different in different countries and we don't always necessarily do things the best way here. Sure. There's lots of room for that conversation.

Justin: Yeah.

Sydnee: When it comes to the glucose tolerance test and diagnosing diabetes, um, the reason we do that is that prior to our ability to diagnose and treat gestational diabetes, a lot of people died. It's just that simple. The outcomes before were really bad.

Once we were able to appropriately restratify, diagnose, and treat people, the outcomes improved. This really isn't one of those areas. There is a lot of debate as to the exact threshold and when to test and who to test at what week. Like, we could get into all that, but the idea that is important to diagnose and treat this is not debatable.

Justin: Right.

Sydnee: And, uh, trying to replace that glucola because it tastes so bad with, like, I've seen, like, fruit drinks and Cokes and smoothies...

Justin: It doesn't make sense because it has to be a certain amount of sugar for a test to work, right? It can't just be, like, something sugary. It has to be an exact amount of sugar, right?

Sydnee: Yes. And it also is proposing that there is something inherently dangerous about the sugar glucose.

Justin: Yes.

Sydnee: Which is—

Justin: Which there's not.

Sydnee: Not. And then of course, the other, like, thing they'll throw in there is, "And it's got a food dye in it," which, like, mine was orange, so...

Justin: Fair.

Sydnee: I am assuming.

Justin: Yes.

Sydnee: Yes. Uh, there was a food dye in it. Um, but it's playing on this idea that food dyes are inherently bad and we've done a whole episode before about how, like, we don't have proof that artificial food dyes are inherently bad.

Justin: [coughing] Yeah.

Sydnee: Generally speaking. Like, we have talked about specific issues. Generally speaking, they're not. Um, so, when did we first figure out gestational diabetes? I mean, because you got to imagine, like, there've always been big babies.

Justin: [snorts]

Sydnee: There've always been babies that were larger...

Justin: I'm proof of that, no matter how far back you go.

Sydnee: Yes. It's weird, then, when you think about the fact that not only would there have always been larger babies, but if, like, in my case. My doc was very clear with us that our first born was not coming out...

Justin: Not coming out.

Sydnee: ...in a vaginal delivery. This was not gonna happen.

Justin: I remember, "if you had been, uh, alive in the 17- or 1800s, this baby would just end up macerated inside of you." [laughs] You remember when he said that to us?

Sydnee: "And then you would become septic and die." That is what he told us.

Justin: [laughs] Best interests, Sydnee.

Sydnee: By the way, I will say, like, I know that sounds like a really shocking thing...

Justin: He's, like, the dude. This guy's the GOAT.

Sydnee: He delivered me.

Justin: Yeah. I mean, he knows what he's talking about.

Sydnee: He's been— Yeah, he was an incredible doctor and part of why he was talking to me that way is because I'm also a physician. He knows me very well. He not only delivered me and was my doctor and delivered our oldest, he also, um, trained me in medical school.

Justin: Yeah, he doesn't— No sugarcoating.

Sydnee: No. And he knew that I understood and I was being resistant because I had a certain idea of how I wanted everything to go and, of course, the best laid plans. But anyway.

Justin: Yeah.

Sydnee: Anyway. It was all for the best. Everyone came out fine.

Justin: Yeah, all good.

Sydnee: Uh, so... And this is— That's true. And I'm sure that happened and it's weird that— 1824 is when we get, like, the first report...

Justin: Yeah.

Sydnee: ... of a large baby. And that kind of started to clue people in, like, maybe we could look at certain things that predispose pregnant people to giving birth to these very large children that pose, like, especially in our prior to anesthesia and a sterile OR and all that kind of stuff. Prior to our ability to safely do a C-section, if you can't get the baby out vaginally... That's catastrophic, I mean...

Justin: So you're saying—

Sydnee: ... that's what we were looking at, was a catastrophic, fatal event for patient and child.

Justin: Catastrophically— These are catastrophically chunky babies.

Sydnee: Yes.

Justin: As a catastrophically chunky baby myself, clocking in at a vivacious 11 pounds. At birth, I understand the threat that we pose and I know that we cannot go unstopped. You can't let us big babies run around unchecked.

Sydnee: [laughs] Doctor Heinrich Gottlieb Bennewitz...

Justin: Don't start me on that guy. We all talk about him over at the big baby meetings.

Sydnee: At the university of Berlin. He wrote up a case report... And this was when, like, we see, again, I'm sure there were big babies...

Justin: [laughs] There have always been, since the beginning of time immemorial, big babies!

Sydnee: We're linking it to... He wrote up a case of a 22-year old woman, Frederica Pape, who, um, during her pregnancy, this was her fifth pregnancy, she had gone to her doctor complaining of— She was thirsty all the time. She could not stop drinking fluids, she was constantly thirsty. And

we've talked about the idea of, like, studying urine on this show many times. We've talked about the urine color and flavor wheel. Remember that?

Justin: Yes.

Sydnee: You can go and...

Justin: Yeah.

Sydnee: You can diagnose lots of things by the smell, color, and taste.

Justin: Yeah. Flavor—taste of the urine.

Sydnee: Of urine. Uh, and specifically, she had cloudy, stale-smelling urine throughout her pregnancy and then, when it came time to give birth, she had a... What was described as "herculean..."

Justin: Yeah.

Sydnee: ... twelve pound baby.

Justin: Yeah.

Sydnee: That's even bigger than you, Justin.

Justin: Uh—

Sydnee: Even bigger than you.

Justin: I— It's not about that. It's just about being a big baby, honey. It's not about comparing specific carriages.

Sydnee: And this is when you first start to see this, like, this connection between— "Okay, there's some symptoms and some things things that are happening during pregnancy and we can see, like, the patient is reporting

stuff to ask that they're observing and then the urine is a signal there's something else there."

Justin: Okay.

Sydnee: And then we have this big baby, which of course, poses a problem for us.

Justin: Uh, listen. We've been very clear about that, where we stand on big babies.

Sydnee: And this was really, like— And this was just one and there were several case reports that he wrote up, but this really laid the groundwork for, throughout the 1800s us beginning to understand and establish, like, there is some sort of diabetic state that happens during pregnancy and we're not sure who's gonna get it, but we probably need to figure out how. And so I'm gonna talk to you about the development of that test, but first we got to go to the billing department.

Justin: Let's go!

[theme music plays]

[ad break]

Justin: Is it weird that I really want to try some of that goop now?

Sydnee: It's so gross.

Justin: Yeah?

Sydnee: So—it's sickeningly sweet.

Justin: Yeah.

Sydnee: Like—

Justin: Could they put it in a snow cone for you?

Sydnee: You just have to eat it really fast.

Justin: I guess so, yeah. And it would dilute it, wouldn't it?

Sydnee: Mm-hmm. You're supposed to just get it down all at once. Like, it's about how your body tolerates the load.

Justin: Right. I gotcha. So, where were we, Syd?

Sydnee: Okay. So we're in the late 1800s, um, and based on these early observations and the fact that, like, we were able, at least, to take these urine samples that we knew smelled a certain way and, again, like, we're not too far removed from the time when people would, like, tip a pinky and... [laughs] taste a drop.

Justin: Yeah.

Sydnee: Because that used to happen. And say, "This urine is sweet." It's sweet. There's sugar in it.

Justin: Mm-hmm. Sorry.

Sydnee: There's sugar coming out of this human, into their pee.

Justin: You got a big baby brewing.

Sydnee: And we already knew that sugar in your urine was connected with diabetes. Because we already knew about diabetes at this point, right?

Justin: Right.

Sydnee: Like, this was an entity and now we're saying, okay. We have this person who before becoming pregnant, pee was normal. During pregnancy...

Justin: Sweet pee.

Sydnee: Sweet pee. [laughs] And so you get all of these sort of, like, a special unit was established in, uh, Scotland by James Matthews Duncan who started, like, to study these specific patients with these symptoms and monitor, like, what happens with these various diabetic patients. What is the outcome in their pregnancy?

Um, and what he was seeing is that from all of these, like, he wrote up all of these observations and this sort of underlines why we do this today. He saw that, specifically, if you had this constellation of really thirsty pregnant people...

Justin: Mm-hmm.

Sydnee: ... with this cloudy urine and they have sugar in their urine, they figured out they get these big babies and the mortality rates were, like, 60% for the pregnant people and 47% for the babies.

Justin: Wow.

Sydnee: So very, very high. Um, and all of this was published in journals in the late 1800s to kind of underline we need to figure out a screening test. But at that point, part of the reason there wasn't this big rush to figure out, like, okay, how can we tease out the people who have gestational diabetes from those who don't is because we still didn't have a great treatment for diabetes yet.

Justin: So it's, like, highlighting it didn't make much sense.

Sydnee: Yeah, like, what are we gonna— Other than knowing this could be catastrophic, like, I don't know— You know, like, you look at a pregnant person and say, "Okay, I can tell you from this constellation of things that you are very likely to have a giant baby that your pelvis cannot deliver." We are just at the point that we can maybe do C-sections. Maybe.

Justin: Maybe.

Sydnee: But even then, like, not everyone has access to it, not everybody can do it. So, I mean, what's the point?

Justin: So we got a— We found some ways of finding the big babies before disaster struck, but didn't have a lot of great ways of getting the big babies out.

Sydnee: Yes. And, well, we also didn't have a great way of managing gestational diabetes.

Justin: Oh, right. And the safety of the parent.

Sydnee: Because that can prevent, uh, having a giant baby. And there are other complications, I'm focusing on the size of the baby because you like to talk about that. But there are other—

Like, part of what can happen in babies that are born to people with gestational diabetes that isn't controlled is that immediately after they're born, their bodies will, because they've been processing all this extra sugar from the pregnant, you know, parent. Their bodies will be producing all this insulin, but all that extra sugar isn't coming in anymore because now they're outside.

Justin: Right, right.

Sydnee: And they become severely hypoglycemic, meaning low blood sugar.

Justin: Oh, the inverse.

Sydnee: Yes. So it is very common, and this is another thing that people get upset about, when a baby is born to somebody who's diabetic...

Justin: Give it a Bomb Pop.

Sydnee: ... that they monitor their glucose levels after birth.

Justin: You don't give it a Bomb Pop.
Sydnee: No, you don't give them a Bomb Pop. And also just large babies, if you remember ours were, all babies get their sugar checked. Large babies, babies born to diabetic parents, that you might have more monitoring, closer monitoring.

Justin: Mm-hmm, right.

Sydnee: Do you remember ours? Do you remember this happening?

Justin: Um...

Sydnee: Our second.

Justin: Yeah?

Sydnee: She had her... Her sugar was a little low.

Justin: Oh, yeah.

Sydnee: Remember?

Justin: Yeah.

Sydnee: And I would have to, like, feed and they would check again and make sure it was okay and... Yeah.

Justin: Yeah, yeah, yeah, that was wild.

Sydnee: This is why. We're avoiding catastrophe that used to happen. Um... And then we discovered insulin. And, again, we've talked about this extensively in our diabetes episode. In 1921, in Toronto, Banting and Best figured out how to get insulin from a dog's pancreas.

And... this was the beginning of our ability to manage diabetes and save lots of lives, right? Like, this wasn't just about gestational diabetes. Like, everybody with diabetes suddenly had a good way of managing it, where you give them the insulin that their body didn't have and save lives. I mean, because before that, it— Really, it was—

The mortality rate from diabetes in general was very high. So we still need to figure out who's going to develop it. Okay. Now we have insulin. We can use it in gestational diabetes.

Justin: Great.

Sydnee: How can we predict who's going to develop it so that we're not playing catch up, right?

Justin: Sweet pee.

Sydnee: And... So, it started with Dr. Priscilla White in 1949, she was working at the Joslin Clinic in Boston. And she came up with a system called White's Classification and this was used for a really long time. And basically, it was, like, an alphabetic list and it was really, uh, patient history based.

Justin: Okay.

Sydnee: So they were looking, it would be based on an interview. There wasn't necessarily any tests to do or anything like that, it was just, "I'm gonna ask you some questions," and based on past pregnancies, based on, um, your medical history, like, do you have high blood pressure, obviously, have you been diagnosed with diabetes before? Family history, like, just stuff in the patient's history that would give you a classification.

Justin: Mm-hmm.

Sydnee: That would risk stratify you as to, like, do we think you might develop diabetes.

Justin: But Dr. House says everybody lies. That's— I saw that your show.

Sydnee: Well, that's true. But, uh, patient history-based is— I mean, it's good. Like, patient history-based screening is obviously critical in a lot of the decision making we make in medicine. Um, but the problem too is that gestational diabetes could affect people that you didn't necessarily predict.

Justin: Mm-hmm.

Sydnee: So there needed to be a nice, standardized way to check, at some point in pregnancy, to just see if, like, are you developing this and there was no way we could have known?

Justin: I have an idea.

Sydnee: What's that?

Justin: What if I make them a super sweet goop and make them drink it?

Sydnee: Well, that's exactly what happened in 1964.

Justin: I should mention, though, it's not science. I just like making pregnant people drink super sweet goop. It's kind of my thing. Um, but if it helps science too, that's, like, an added perk.

Sydnee: I have to imagine the first people who tried this, like, were ready to throw it back in the researcher's face, like, "You know I'm pregnant and I feel like crap and you want me to drink this?" [laughs]

Justin: Well, maybe it was better then. Maybe they were using, like, Sprite syrup from the machine, you know?

Sydnee: It probably wasn't dyed, like...

Justin: No.

Sydnee: ... it probably wasn't.

Justin: It probably doesn't need to be dyed. We could probably meet you halfway on that.

Sydnee: No, probably doesn't. I don't— I always wondered, you know, that— I don't know that point, um, do you think, like, it looks more like a drink that I have had in my life. If it was just a clear glucose substance?

Justin: Oh, it's like drinking Karo syrup or something like that.

Sydnee: Yeah. It's not fizzy or anything.

Justin: Yeah, yeah.

Sydnee: You know what I mean?

Justin: Yeah.

Sydnee: It's like Kool-aid.

Justin: Just getting thirstier and thirstier, we got to move on.

Sydnee: [laughs] So, John O'Sullivan and Claire Mahon invented, um, originally the two-step oral glucose tolerance test. Um, and basically... And this is— When I say two-step, I mean, like, a one hour and a three hour. Those are the two steps.

Justin: Got it.

Sydnee: So. Uh, they were the ones who first standardized and came up with, "We'll give you 50 grams of glucose, um, and then we will check your blood glucose in an hour." And then, of course, in the second step, we check your sugar, 100 grams of glucose, every hour for three hours.

Justin: Right.

Sydnee: Um, and the reason that we still use those amounts and those hour cut offs and all that same criteria is because that's how they did the study. Um, any kind of, like, screening tests we're using, any— Not just screening tests, diagnostic tests. In order to come up with what's a positive answer and a negative answer...

Justin: Mm-hmm.

Sydnee: ...unless we're just looking for something. Like, I guess if you're checking someone's blood for bacteria, you don't really need a cut off, right? It's either there or it's not.

Justin: Right.

Sydnee: But for a lot of other tests we do, we're using...

Justin: It's more of a gray area.

Sydnee: Yeah, we're using a cut off range. So to know what a normal hemoglobin level is, they went out and sampled hundreds of thousands of people in the population. They just took their blood and looked at what their hemoglobin was. And this fell into a bell curve, right? Are you familiar with that, Justin? A bell curve?

Justin: Yeah. Yeah, Syd.

Sydnee: And then they took the middle chunk of the bell curve and said, "This is normal." And then...

Justin: Anything better or worse than this, you're done.

Sydnee: Isn't. Right? And so, like, that's where we get these ranges. And so when any test that you're coming up against, if you're wondering, like, "Well, why do we do it this specific way?" It's because it was the way we did it when we first came up with the test. It's the way the test was standardized. And it's the only way that the test continues to work. If you do the test—

Justin: Because you can't have the data— The data is depending on this response, right?

Sydnee: Yes.

Justin: So you can't compare it to other people's responses because the input isn't standardized.

Sydnee: If we gave someone who didn't have diabetes, we gave them a 50 gram glucose load, and then we check their blood sugar in an hour. And then we did that over and over and over and over and over again, and we came up with what that cut off number is.

Justin: Right.

Sydnee: If you give somebody a Pink Drink from Starbucks, I don't know what their glucose level will predictably be in an hour. I could give you some basic ideas based on we kind of know how the body handles sugar load and how a diabetic versus non-diabetic person would handle that. We kind of have those ideas.

But as far as, like, a perfect cut off, of course I couldn't give you that. Because I never did a study where I gave a bunch of pregnant people Pink Drinks and then...

Justin: Not that you wrote down, I mean, you've done your own informal work.

Sydnee: I tried the Pink Drink actually after pregnancy because there was a rumor that it would help with breast milk production. I don't really know that that is true, but I did like the Pink Drink, so. You know, there was that. Um, I—

Justin: You must not have loved the Pink Drink, though. I've never seen you order one ever again.

Sydnee: No. I prefer coffee. Uh, anyway. So that is why we continue to do the test that way is because back in 1964, when O'Sullivan first sort of wrote the cut-off diagno— You know, values and everything that was diagnostic, this is how they did the test. There are different kinds of sugar in different beverages and foods and everything, right?

Justin: Yes.

Sydnee: There are lots of forms of sugar. And they will raise your blood glucose in slightly different ways...

Justin: Okay.

Sydnee: ... to different levels and at different rates and so— And, plus, I don't know if you just say, like, "I drank some Coke..." How much? And that's a different kind of sugar. And exactly how many minutes have elapsed? I can't use that diagnostically. So people who are advocating for you to go against your doctor's orders and do the test sort of in your own way, you're not doing the test anymore.

Justin: Yes. You're just drinking something.

Sydnee: Yes. And so the data that your doctor gets to try to interpret will not mean anything. And the risk of that is that you may be diagnosed with gestational diabetes when you don't have it or you may not be diagnosed with gestational diabetes when you do have it. Um, and that's bad.

Justin: Yeah.

Sydnee: For all the reasons we already talked about! Because the mortality rate of gestational diabetes was very high for both the pregnant person and the baby prior to our ability to test for it, diagnose it, and then treat it with insulin. Um, so anybody urging you not to do that—

And now, a lot of people point out, there's been a lot of discourse through the years. We've had multiple, like, giant international, uh, workshops where

they get experts— Because, basically, we take all this data and then we get all of the experts together in a giant conference...

Justin: And what they make of it.

Sydnee: ...and make guidelines based on the data, right? Um, the data doesn't always...

Justin: [crosstalk] ...some wild parties at that Just How Chunky Can a Baby Be conferences.

Sydnee: I bet, you know, and that'd be interesting to know, like, how wild did different medical conferences, based on the specialty get.

Justin: Yeah.

Sydnee: These are OBGYN conferences. I don't know. I'm a family doctor.

Justin: yeah.

Sydnee: Our conferences, like, everybody just assumes we, like, all wear Birks and have sing-alongs by the fire and...

Justin: I bet dermatologists get the wildest.

Sydnee: You think? Dermatologists?

Justin: Everybody with perfect, touchabley soft, creamy skin. The light reflecting off of it in just so. Everybody taking care of their look, everybody looks great, everybody looks phenomenal. It looks like, uh, friggin' Hunger Games, the rich people up there with their perfect skin, incredible...

Sydnee: [laughs]

Justin: ... bunch of golds up there.

Sydnee: Alright, I definitely think compared to a familiar doctor, when ours would be at a campsite, it would not be fancy.

Justin: Yeah.

Sydnee: 'Cause we're all, um, we don't make that kind of money.

Justin: Orthopedists would be wild too, because they get drunk and they'd be like, "I wanna fix any bones."

Sydnee: I don't think they would get drunk. They take way too good care of themselves for that.

Justin: Oh, okay.

Sydnee: They wouldn't drink. They'd be very well hydrated, they'd all go—

Justin: [overlapping] They would get— They would get high on—

Sydnee: They'd all go jog together and then they'd lift.

Justin: They get high on lactic acid and then...

Sydnee: [laughs] Yes,

Justin: ... just start fixing bones.

Sydnee: Yes. They're healthier than we are. Uh, anyway, so...

Justin: Not healthier than me! I review video games!

Sydnee: So they've held all these...

Justin: [quietly] Peak condition.

Sydnee: ... workshops through the years. I think this is important to bring up because, again, all of this stuff is nuanced and you can't just acknowledge one side or the other. We have reevaluated many times through the years, from 1979 up to 2005 and then again as of 2020, we have reevaluated all of these guidelines over and over and over again.

And different countries do manage this differently. A lot of what I'm telling you is the way the United States has decided, you know, our medical organizations have standardized our care. There are other countries where they don't necessarily screen everybody based on the same criteria or at the same number of weeks. They look for different things.

And the idea is there is a thought, like, do you screen too much in the US? But there are other countries where we would argue you don't screen enough because you're missing people and you're not managing their diabetes.

Um, so there's definitely room for people who are well-intentioned and understand the data who are experts in this field to sit and discuss and debate what is the best way to take this screening tool and apply it appropriately so that we save as many lives as possible? That's, like, a conversation that we have about everything in medicine.

Um, but currently, our best advice is do the test when your medical provider recommends you do the test. And do it in the way— Certainly, if you're gonna do it...

Justin: Do it right!

Sydnee: Do it the way that they tell you to because otherwise, like, you've drunk some stuff, you got your blood drawn, maybe you paid for it because it's the United States and we make you pay for medical care here.

And if you did it wrong, it's meaningless and you've wasted your time and you got stuck with a needle for no reason. Like, what's the point? If you're gonna do it, do it right, and let me tell you, just do it.

Justin: Just do it.

Sydnee: Do the test. It's good to know. We can manage—

Justin: Maybe they'll have banana. You never know. Maybe they'll have banana.

Sydnee: I don't know. I don't know what flavors they have. Mine was orange. But before we had this amazing medical advance, the glucose tolerance test, and insulin to manage diabetes, before that a lot of people died unnecessarily. So that's why we do it. I think that's probably the best reason to do something in medicine.

Justin: I agree.

Sydnee: Because it prevents death.

Justin: Um... [laughs] That's actually, the first day, they're like, "Why do we do all of this, you may be asking? Well... To prevent death." Uh, thank you—

Sydnee: As long as we possibly can.

Justin: Thank you so—good job, Syd. Thank you so much for listening to our podcast. We hope you've enjoyed yourself. We hope that you'll have a wonderful rest of your week. Thanks to the Taxpayers for the use of their song Medicines as the intro and outro of our program and thanks to you for listening. That's gonna do it for us this week on Sawbones. 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]

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