

Sawbones 271: Cavities

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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 co-host, Justin McElroy!

Sydnee: And I'm Sydnee McElroy!

Justin: [imitating a trumpet] Everyone, please join me in welcoming, the hero of the day, bravest gal I know, Dr. Sydnee McElroy. Hooray for Sydnee! [imitating a crowd cheering]

Sydnee: Thank you, Justin. Thank you—

Justin: Hold on, I think I have an applause button. Wait, hold on. I think I have an applause button. Wait, hold on. I—I got—

[rimshot]

It's—it's around here somewhere, hold on. I think I got an applause button. Hold on.

[rimshot]

Is that—

[rimshot]

That's a rimshot.

Soundboard: Get that—get that money. [cash register sound effect]

Justin: Nope. That's—

[sad trombone]

Justin: No, that's a trombone.

[laugh track]

[theme music plays for a single beat]

No, that's the music. Hold on, I got—I—

Soundboard: Toronto!

Justin: That's Paul Stanley, sorry.

[crickets]

[Seinfeld bass riff]

[laugh track continues]

That's not—okay, I don't have it on here anymore, but like, imagine there's applause.

[crickets continue]

Sydnee: Thank you, Justin. Yes, the—

Justin: Sorry, the crickets are still goin'.

[crickets continue]

Justin: You just gotta let 'em tire themselves out. There we go!

Sydnee: At long last, I finally went to the dentist.

Justin: Yes. Sydnee did, after... How long's it been?

Sydnee: I don't wanna talk about it.

Justin: Okay.

Sydnee: The important thing is, I've gone.

Justin: It's over a decade.

Sydnee: Yes. I mentioned on the show—

Justin: It's over a decade.

Sydnee: I mentioned on the show a while ago that it'd been a long time since I'd been to the dentist—

Justin: Over a decade.

Sydnee: —and I—I got some emails, uh, from some of our dear listeners, who were very concerned about me. They were emails of concern. "You should go to the dentist," is what they were all saying.

Justin: I tried to make it a Max Fun Drive stretch goal, that if we hit 25,000 new and upgrading donors, Sydnee would go to the dentist.

Sydnee: But I had already made an appointment at that point.

Justin: That's right.

Sydnee: Yes. 'Cause I realized that was true, uh, and I needed to take care of my teeth, so I went to the dentist. It wasn't as bad as I thought it was gonna be. I mean, the experience was not bad at all, but like, my—my dental situation was not as bad.

Justin: Sydnee's a fastidious brusher.

Sydnee: I am.

Justin: She's like a DIY, you know, survivalist approach to tooth care, that she's gonna do it all on her own.

Sydnee: It's because I—I never wanted to have to go to the dentist, and to be fair, I will note... And this is not a unique problem, but I think it is worth mentioning that a lot of people neglect their oral health, in terms of going to the dentist regularly, because they don't have dental insurance, and that was the beginning of—of the problem for me.

After I was off of my parents' insurance, I didn't have dental insurance, so I didn't go, 'cause I couldn't afford it, for a long time. Now, obviously we've had dental insurance longer than I have...

Justin: By a few years.

Sydnee: Yes. Than I have gone. So, I—I didn't have a good excuse for a while. But, uh—but many people in this country suffer from the fact that they don't have dental insurance and it's very expensive sometimes, depending on what work you need.

Justin: But not you. I mean, that wasn't your excuse.

Sydnee: No, that wasn't my excuse recently. Uh, so I want to talk about cavities, or dental caries, if you prefer.

Justin: I don't.

Sydnee: Same thing.

Justin: Everybody says cavities.

Sydnee: Uh, because I had a few, and I've had some filled. I will return next month to finish the job. Man, I wish they could just numb my whole mouth and do it all at once. Just get it over with.

Justin: Friends, I did go with Sydnee to the dentist's office to provide moral support. She was very strong and brave for the entire experience. I was very proud.

Sydnee: It's, uh—it's—I do not like not knowing everything in these situ—I'm used to—I go to the doctor and I kinda already know what's going on and I know the deal. It was very uncomfortable.

Justin: Yeah.

Sydnee: To not know, so I empathize with all of my patients now. Better. I'm better at it.

Justin: Anybody suggest this topic, Syd?

Sydnee: Yes, thank you Jenny and Jillian and Joe—

Justin: I like that!

Sydnee: —for suggesting this topic.

Justin: That triplet!

Sydnee: I know!

Justin: Yeah, I love that.

Sydnee: And Justin, for making me go to the dentist.

Justin: Justin. Another J name.

Sydnee: Uh—

Justin: Jesus, for creating dentistry.

Sydnee: No. Nope. No, not—

Justin: And Judy Woodruff, your dentist! [laughs]

Sydnee: Our—[laughing] my dentist. Thank you, Dr. Judy.

Justin: Thank you, Judy.

Sydnee: Uh, the history of tooth decay goes back a very long time, but it is probably not—

Justin: Well, yes. [laughs] One would assume.

Sydnee: Well, probably not necessarily as—as long as you would think, because it looks like, as we go back into like, our pre-homo sapiens ancestors and some of early humans, that teeth actually did pretty well for a long time.

Justin: Hmm.

Sydnee: We don't find lots of old skulls with lots of dental decay, as you would think, right?

Justin: Right.

Sydnee: 'Cause there was no dentistry happening. But there weren't a lot of cavities. It seems like in the neolithic period is when this changed. That was about—around 10,000 years ago. We start to see this huge uptick in the number of cavities we find, dental decay and cavities we find in these old skulls.

And so, a lot of people have tried to figure out, like, why? Why, all of the sudden, did everybody's teeth get so bad?

Justin: They invented Nerds.

Sydnee: That's—

Justin: And everybody was just wild for 'em.

Sydnee: [laughs quietly] Uh, there have been a lot of suggestions that farming could be the reason that we see—this is about the same time that farming started to occur, so you see these kind of hunter gatherer societies settling down and growing grains and carbs and... It's the—a lot of people have tried to link it to that. Like, is it the carbohydrate rich diet of the farming communities that led to a lot more dental decay?

And there's some support for that, 'cause there's a bacteria, for instance, streptococcus mutans, which mainly eats carbohydrates, sugars, and will turn it into this—they leave behind this acid after they eat the sugar. They leave behind an acid that can eat away at your enamel, so if you're eating a lot more grains, this bacteria's gonna thrive in your mouth. You're gonna eat away at your enamel. You're gonna get more cavities.

But that doesn't always work. They've looked at different societies around the globe, and other farming communities... This wasn't necessarily a one to one relationship. So, partially it's the diet. There's been some other suggestions. If you look at, uh, the difference in dental decay between, like, male skeletons and female skeletons, they find that female dental health was way worse.

Justin: I wonder if people who adhere very strictly to a paleo diet would have less problems, or fewer problems.

Sydnee: I don't know. It'd be interesting to see, but they—but they've also suggested that it might have something to do with people who could become pregnant.

Justin: Hmm.

Sydnee: Uh, pregnancy creates hormonal changes that can make you more likely to have issues with dental decay and cavities and that kind of thing, so they've suggested that when communities settled down into little farming places and stayed in one place for a long time, we see that fertility increased. People had more babies, because they were staying in one place. And these, uh, people who became pregnant, may have had more cavities, because they were becoming pregnant more, and more of these hormone—so, is that why?

Anyway, one way or another, about 10,000 years ago our teeth got bad, and they've been bad ever since. [snorts]

Justin: Sorry, teeth! [laughs]

Sydnee: Uh, for a lot of human history we thought that worms were the reason.

Justin: And... they were!

Sydnee: No.

Justin: Thanks, everybody, for joining us this week on Sawbones. [laughs quietly]

Sydnee: No, and I—I think it's funny, because I was thinking like, "Oh, this'll be a gross thing that everybody will freak out about. We used to think worms lived in

our teeth." I've read, there are actually—this is actually still a common question you see on, like, question and answer forums online.

Justin: Just say Yahoo Answers, Sydnee, it's okay.

Sydnee: [laughs] "How do I get rid of the worms in my teeth?" Tooth worms do not cause cavities, but we have thought that since ancient times.

Justin: What d—well, what do tooth worms cause?

Sydnee: There aren't tooth worms.

Justin: Oh. Well, see, the—it was a very misleading phrasing. [laughs] "Tooth worms are your friend."

Sydnee: They—ev—the—

Justin: "They repair cavities with their viscous mucous."

Sydnee: No, there are no tooth worms. It's weird, though, because you see this concept of tooth worms spanning different cultures. Like, it has arisen spontaneously all over the globe throughout history, and everybody has a different kind of idea of like, exactly what the worm looks like or what it does, but the worm is pretty prevalent in our idea of why our teeth had holes. Which, I mean, sorta just makes sense. Like, it's a little teeny hole. It looks like something burrowed it. Maybe a worm!

Justin: [high pitched voice] "Maybe it was a worm? I don't know!"

Sydnee: Uh, some of the oldest evidence of this comes from a Babylonian tablet, a cuneiform tablet, which was what is called "The Legend of the Worm" on it.

Justin: The Legend of the Worm. My favorite Kid Rock album.

Sydnee: Uh, and—and it—basically, there's this—the marsh created the worm and the worm went weeping and said, "What am I gonna eat?"

I'm paraphrasing. I'm not gonna read this whole thing. Uh, and the worm said, "Lift me up, and among the teeth and the gums cause me to dwell. The blood of the tooth I will suck, and of the gum I will gnaw its roots."

Justin: Ugh...

Sydnee: The ancient legend of the worm. I don't know that I'm gonna set that to music anytime soon.

Justin: Yeah.

Sydnee: Uh, the reason, in part, is the little hole, I think. It looks sort of like a little wormhole. The other reason, we think—

Justin: Whoa, amazing! Interstellar travel is possible!

Sydnee: In your mouth!

Justin: In your mouth!

Sydnee: The—it's probably also because if you remove whole diseased parts of teeth, like, big chunks of decay, it can kinda look like worms. Kinda look wormy.

Justin: Mm-hmm.

Sydnee: Squirmy wormy.

Justin: I don't like this. I've recently realized, I don't like talking about this very much.

Sydnee: Yeah. I mean, it's unpleasant.

Justin: One time I was eating a granola bar and a piece of my tooth broke off in it, and I was just like, chewing on a piece of my tooth, and I still think about that a lot.

Sydnee: [pauses] I'm really sorry.

Justin: Yeah, it was hard. It was on a plane, too, so I couldn't just like, stand up and be like, "I quit life! Everyone! It's too hard! I've decided—I've been through a lot of things, but this is too far! I cannot handle life!"

Sydnee: The last tooth that I lost, uh, it came out when I was eating one of those Oreo cookie bars, you know, those cereal bar things.

Justin: Yeah, yeah.

Sydnee: The last one I lost, in the bar.

Justin: I uh—I have told Sydnee this many times, but I live in legitimate dread of the day when our children start losing their teeth. I—that was the gnarliest process for me, and I have like, a lot of issues with it, and I cannot think about it. Ugh! Ack!

Sydnee: Luckily, it does not bother me, so I will handle that.

Justin: That's good.

Sydnee: I will handle that part of—of child rearing.

Justin: Are you gonna be a—can I ask you this? Are you gonna be like, a yank it out of their head type? Are you gonna be like—do the floss on the... I'm wondering. We have not dipped into this since, like—it has not been an issue for us as parents yet.

I'm wondering if some of the gnarly stuff our parents were into is one of those things were you like, look back on it now, and everybody's like, "No, don't do this! Don't tie the floss to the tooth and then slam the doorknob and—"

Sydnee: My parents didn't do anything like that. They just said, like, "It'll come out when it comes out. Try not to swallow it."

Justin: My parents would do it with a washcloth. [loudly] I hate this! I want to talk about anything else!

Sydnee: Okay, let's not—well—

Justin: [groans] I'm sorry—

Sydnee: This isn't the show! You—

Justin: —if you are like me. Sorry.

Sydnee: This isn't the show. You took us in a different direction.

Justin: I'm pu—

Sydnee: I'm talking about—

Justin: I'm putting us back on the road.

Sydnee: —the tooth worm! The fictional tooth worm.

Justin: Yeah—why are you doing air quotes when you say "fictional," Sydnee? I don't understand.

Sydnee: [laughs quietly] I'm not.

Justin: You folks can't see this, but—

Sydnee: I'm not, I'm not, I'm not. So, part—

Justin: This is like the penis bone all over again!

Sydnee: —it was the—part of it was the hole that it left, and then the other part is that maybe it kinda looked like worms. Maybe the part that was left behind after they would remove a tooth sorta looked like worms. One way or another, people thought—

Justin: You already said this and it was the worst, and it killed me, and you're saying it again!

Sydnee: —people thought that there was a tooth worm. Uh, they thought that a toothache was when the worm wriggled around.

Justin: [snorts] Sure, why not.

Sydnee: That's what you were feeling. And, like I said, in different places it looked different ways. In, uh, British folklore, it looks like an eel. Germans thought it was like a maggot, and it was red, blue, and gray.

Justin: [shudders]

Sydnee: Either way—

Justin: Uh-huh.

Sydnee: Uh, we finally figured out in the 18th century, Pierre Fauchard, who is known as the father of modern dentistry—

Justin: I fought him hard for that, but congratulations, Pierre.

Sydnee: [laughing] He was the one who said, "I think the decay of our teeth has something to do with sugar," and this idea was built upon until we figured out that it has to do with bacteria in the mouth that live on sugar, and that kind of thing, that causes tooth decay, and it has nothing to do with a tooth worm.

But it really—you will find this all the way up into the 20th century. People who are still arguing for the existence of a tooth worm, and then today, I think there is still... People hear these whispers and think, like, "Is this something I missed? Was I just never taught this?" Um, but there are no tooth worms. Do not worry.

Justin: All right.

Sydnee: There were these, uh, electron photograph—microscopic electron microscope pictures that they took of the tooth once, within the last, like, decade or so. Where they looked at the tooth really closely and they saw these teeny little worm-like structures in there and everybody freaked out and went, "Were we wrong? Was it really a worm?" It was not, in fact, a worm. It's some sort of... They're not sure. Like, some sort of... Yeast, maybe—

Justin: They're not sure, Sydnee. If—

Sydnee: Anyway, it's not a worm.

Justin: —"We're not sure," says science—

Sydnee: The point is, it's not a worm. But it—there was a— [laughs]

Justin: [loudly] "It's not worms. We don't know what it is. Hey, it's me, science. We don't know what it is, but it's probably not worms."

Sydnee: Nope. Everybody joked about it, 'cause it was like, "Oh, we were wrong, there is a tooth worm!" It's not. It's not a tooth worm, but you will find this study. It's scien—

Justin: But—so what is it?

Sydnee: —scientists found it very funny.

Justin: Mm-hmm.

Sydnee: We're still not 100% sure. But the scientists—

Justin: Uh-huh. But it's not worms.

Sydnee: —thought it was very funny. Dentists got a big joke—got a big kick out of it. Uh, so as soon as we started getting cavities, we started trying to fix them. We have found evidence that we attempted to drill out, or—well, initially not drill out, but scrape out, I should say, cavities. Uh, 14,000 years ago.

Justin: Wow!

Sydnee: We found—we found a skull with a decaying tooth, and there was, uh, some marks on it. There were some marks on the tooth, on the biting surface of the tooth, that looked deliberate. They looked like they had been kind of, you know, scraped away it. And it looks like something called a microlith, which was like, a little flint blade that would have been used for different things, that may have been used to make these marks on this teeth.

I found a—as I was reading about this, I found this note that there was a research team at the University of Bologna who tried—they experimented with modern teeth and similar sorts of microliths to confirm that they could have made such marks. Which—I like the passive way that is worded.

Justin: Yeah, right.

Sydnee: "They experimented with modern teeth."

Justin: Hmm... wink!

Sydnee: Hmm...

Justin: Probably in a skull, though.

Sydnee: I'm assuming. I just like the idea that somebody volunteered.

Justin: Yeah. "Yeah, ju—"

Sydnee: "You can scrape my teeth with that ancient microlith!"

Justin: "With that old rock! Go for it!"

Sydnee: You know—you know what, though?

Justin: "I am nasty!"

Sydnee: You know what the sad thing is? That's the state of—of, like, dental care in the United States. That's the state—not, not on the dentists, but on our insurance, on our crappy insurance system, where people don't have insurance. You know somebody would be like, "I got a cavity and I can't afford to go get it filled. Will you microlith my tooth?"

Justin: Yeah.

Sydnee: Uh, anyway. So they tried, and they thought, "This is probably it." The dental drill is super old.

Justin: Yeah, I was—I was shocked when you mentioned this to me as you were researching.

Sydnee: Yes. The dental drill is somewhere between 9,000 and 7,500 years old.

Justin: Phew. Wild.

Sydnee: Can you believe that?

Justin: It's older than pants.

Sydnee: Yeah.

Justin: Pants are 3,000 years old, I heard in a really old thing. 3,000 years old.

Sydnee: Well, there you go. So, older than pants. The dental drill.

Justin: Older than pants!

Sydnee: Now, of course the drill that they would have used 9,000 years ago is not anything like the drill, I hope, that they used on me this week. I hope.

Justin: I don't know. You look at their tools back there, and they still look pretty... pretty haggard.

Sydnee: They found, in a neolithic graveyard, uh, in what is now Pakistan, they found all of these different skulls with these molars that had very precise holes in them, and they looked like they had been drilled.

They did not look like something that could have been scraped. It looked like something that would have been done with some sort of drilling tool. They think it was probably something called a bow drill.

Justin: Mm-hmm.

Sydnee: This is like, some sticks and a sharp stone and a cord, and you think about it looking like a bow—like an archer's bow, you know. And then you're gonna wrap it around the stick and hold it perpendicular. Do you kinda get what I'm saying?

Justin: Yeah, yeah-yeah.

Sydnee: And so it'll twist in there, and then it will provide—

Justin: Sure.

Sydnee: —more, I guess, like—

Justin: Torque.

Sydnee: —torque. Yes.

Justin: Yeah.

Sydnee: Uh, and you would rotate that, and that would—that would cause the drill to work. And then you've got the stone on the end of it, of the stick, for the cutting part. Um, again, they tried this and they found that it did make holes that look like the holes in these teeth, so.

Justin: Wow! Okay.

Sydnee: So the dental drill may be, like, 9,000—

Justin: That's wild.

Sydnee: —years old. Uh, of course people are still—we can't confirm that for sure. Some people are like, "Ah, I don't know. This could have just been hammering. Maybe like, something pointed and a—and a hammer, and just like, kind of pound it in there."

Justin: So after we got these all drilled out, what'd we—what were we jamming in there?

Sydnee: Well, I'm gonna tell you that Justin, but first, let's go to the billing department.

Justin: Let's go!

[theme music plays]

Justin: Folks, our first sponsor this week is ZipRecruiter. You know, it's tough to find the right people for your business. As a small business owner myself, I can tell you that finding the right people? It's a challenge.

But, there is one place where you can go where hiring is fast, simple, and smart, and that place is...

Sydnee: ZipRecruiter!

Justin: Yeah, Syd. Yeah. How did you know about ZipRecruiter?

Sydnee: That's the—we're doing the—

Justin: It's the most well-kept secret in the industry! I'm letting people in on the real stuff, the inside track to hiring the best people. Because they're gonna send your job to over 100 of the web's leading job boards, but they don't stop there. Syd, how many times have you been hired for a new job in the last year?

Sydnee: I... have—I haven't.

Justin: How many people have you hired in the last year?

Sydnee: I—have—none.

Justin: And how long have you had your ZipRecruiter account?

Sydnee: I... haven't.

Justin: There it is, folks!

Sydnee: Ah!

Justin: 100% proof!

Sydnee: I understand now!

Justin: With their powerful matching technology, ZipRecruiter scans thousands of resumes to find people with the right experience and invite them to apply to your job.

ZipRecruiter is so effective that four out of five employers who post on ZipRecruiter get a quality candidate through the site within the first day. So folks, don't be like Sydnee: unemployed, and unemployeeing—

Sydnee: In Greenland!

Justin: [loudly] Unemployed in Greenland! [laughs] Uh, right now our listeners can try ZipRecruiter for free, at this exclusive, secret web address. Keep it secret, keep it safe. Ziprecruiter.com/sawbones. That's—psst, shh... [whispering] Turn your headphones down. Ziprecruiter.com/sawbones. ZipRecruiter: it's the smartest way to hire.

Let's say you find the perfect employee, Josh. And Josh is such a great employee that you wanna make a website about—

Sydnee: Celebrating Josh.

Justin: —celebrating Josh.

Sydnee: That's good!

Justin: But how are you gonna do that, Syd? You don't know anything about making a website. Not you, personally. The—the general you doesn't know. And—but you do—

Sydnee: Well, I also don't, so that's—that's fair.

Justin: That's fine, but if you wanted to celebrate Josh, there's one place that's gonna help you turn that dream into reality, and it's Squarespace. They're gonna help you turn a cool idea, like celebrating Josh, into a new Josh-centric website. Public or p—publish all your Josh content! Sell Josh related proje—

Sydnee: [laughs quietly]

Justin: —products or services of all kinds, and more! They've got beautiful, customizable templates that are gonna frame all the great pictures of Josh that you have. They're created by world class designers, some of which are assumedly named Josh. Everything optimized for mobile. Josh is gonna look great on phones, too. And, uh, they got a new way to buy domains, and choose from over 200 extensions. Let me check on josh.josh.

[keyboard clicking]

That's not a real website. But, uh, what is a real website is Squarespace. It's a real big help to anybody that wants to, uh, build the website of their, and Josh's, dreams.

Head to squarespace.com/sawbones for a free trial when you're ready to launch. Use the offer code "sawbones" to save 10% off your first purchase of a website or domain. Squarespace: build it Josh!

Sydnee: Disclaimer: please don't do this to Josh.

Justin: Josh is so embarrassed. Josh is actually looking for other work. [snorts] That's Josh's thing. Josh is on ZipRecruiter still. [laughs quietly] Cruising.

Sydnee: All right, so Justin, you want to know about fillings.

Justin: Yeah, that's me!

Sydnee: So, since we started making holes in teeth, we figured we should put something in there. That's a—that's an old idea, too. So, the first—

Justin: Made this hole— [wheezes] gotta fill it with something!

Sydnee: We made this hole, what are we gonna do now?

Justin: That—I like to imagine we figured out the hole part and then we were like, "Oh, dunk! The hole! Crap! Okay, look around."

Sydnee: There—there was a—we found a human jaw that is 6,500 years old, uh, in what is now Slovenia. And as they were doing—they were testing some new 3D imaging out on it.

Justin: Mm-hmm.

Sydnee: You can test—test new imaging modalities out on these old skulls and bones and things. And, uh, they were checking it out, and they found that there was something stuffed in one of the teeth, that was unusual—

Justin: It was a map. It was a map to Oak Island.

Sydnee: [laughs quietly]

Justin: Tiny map.

Sydnee: It was the Templars, all along.

Justin: It was the Templars, hiding in there.

Sydnee: No, it was—it was a cap of beeswax, and it looked like it had been put in a little hole to fill the hole.

Justin: An impermanent but elegant solution to the problem.

Sydnee: Well, it—it makes—it's probably a good choice for the time.

Justin: Sure, yeah.

Sydnee: Beeswax. It's pliable and soft, and if you get it warm—well, I mean, it's pliable and soft when you get it warm, but then once you put it in there at body temperature, it would actually harden, so it would be pretty—now, I—I mean, it's—

Justin: You gotta get replaced frequently, I would guess?

Sydnee: It—I mean, it's hung out in there for 6,500 years.

Justin: Fair point, fair point!

Sydnee: Uh, now, granted, I don't think he was chewing much for [laughing] a majority of that time.

Justin: Yeah, right.

Sydnee: Uh, it also may have been somewhat anti-bacterial, not that they necessarily would have known that, but still. Not a bad choice. So that's probably the oldest filling. I wanted to make a note. A lot of that information that I've just given you—I usually don't—

Justin: Was made up.

Sydnee: No. I found this great BBC article by Colin Barris, and I just wanted to make a note. A lot—he—man, it was a great article. It's so rare that when I'm doing an episode of Sawbones, I find one article that like, really hits a lot of major points, so I wanted to mention it.

Um, the ancient Egyptians tried filling teeth, too. Uh, the Edwin Smith Papyrus mentions all kinds of treatments for dental problems, as does the Ebers Papyrus. Uh—

Justin: [incredulously] Was there an ancient Egyptian dude called Edwin Smith?

Sydnee: No, that's who found it.

Justin: Oh. Darn.

Sydnee: We've talked about this.

Justin: I know, I know.

Sydnee: [laughs quietly] Uh, some of them are remedies for loose teeth. Some of them are how to either fill the tooth or to like, hold it in place. So, you could use—like, a tooth filling for a hole would have also doubled as something if like, a tooth is loose, you would just kind of pack this in there and try to keep it.

Justin: Great.

Sydnee: Because it was—you didn't—you tried not to have your teeth pulled, or tried not to lose your teeth.

Justin: Sure, that would be... a death sentence. [snorts] Not quite, but, could be!

Sydnee: So, they talk about things like a filling agent, like ground barley, and you could mix it with some honey and some yellow ochre, and you could either splint the tooth to keep it there or just stick that in a hole that may be in your tooth.

Um, they found that there have been—there were some cavities that were filled with linen, and you might have dipped them first in something like cedar oil or fig juice, something like that, and then just stuff it in the... stuff it in the hole, there.

Uh, we have found evidence, uh... Rhazes, a Persian physician, who would have been alive in the late 800's, had also been drilling and filling teeth. He used alum and mastic, which is like a gum resin. It's like a resin filling. I have.

Justin: Oh, yeah.

Sydnee: Not that, not—

Justin: Not that specifically.

Sydnee: —not that kind of resin, but a different composite resin, which we'll get into. Uh, we also started using—by the Middle Ages, we were adding things like ground sheep bone.

Justin: Mmm! Charming!

Sydnee: Something—something to add in there. Which, I mean, isn't... Again, this isn't a wild idea, considering that like, the resins now might have little glass—

Justin: We were getting—

Sydnee: —particles in there.

Justin: This almost seems like it borders more on engineering, which I think we got good at a lot earlier than we got good at medicine.

Sydnee: Uh—well, that's very true, 'cause you didn't... We're trying to fill a hole.

Justin: Right. We can do that. [laughs]

Sydnee: We can—

Justin: We figured that out.

Sydnee: We figured out how to make a hole—

Justin: Yes.

Sydnee: —and then, a few hundred years later, we figured out how to fill a hole.

Justin: Yeah, so that's huge.

Sydnee: And—and really, in the mark of human medical history, that is—that's incred—that's lightning-speed progress.

Justin: Sure, right.

Sydnee: Uh, so they also found that gold leaf made a good filling a long time ago, and as you may know, gold has been used to fill teeth—I mean, up to this day you can get gold fillings.

Justin: Sure.

Sydnee: So that's not—we figured that out a long time ago. Um, a lot of the other treatments in addition to filling a tooth throughout the medieval period, uh, would have been based on the idea that there were tooth worms. We still believed in tooth worms, so a lot of the other treatments would have been aimed at trying to get rid of the tooth worm.

Uh, they didn't like to do a lot of invasive stuff in this period in history. You wouldn't want somebody digging around in your mouth, drilling holes and filling cavities. You tried really hard not to get 'em pulled.

Justin: It was the nastiest period in medical history, as far as I'm concerned. It was the—the worst, uh, confluence of understanding and stupidity, I think, where it's just like... I just wouldn't wanna be sick in the middle ages. It's rough back then.

Sydnee: No, I wouldn't wanna be sick at any point in human history, but definitely, like, the closer to now is better.

Justin: Well, sure. Of course, yeah.

Sydnee: So, they, uh—they would do things like, non—I would say non-invasive procedures, like a charm. Or—

Justin: Ah, yes.

Sydnee: —you know, a spell, or a prayer, or something like that. Uh, sometimes just bloodletting. You could, uh, pray to Saint Apollonia on her feast day, and that will cure your toothache.

Justin: When's that?

Sydnee: February 9th, so you gotta wait 'til February 9th.

Justin: Aw, what if you got on February 10th? Ugh. The worst.

Sydnee: You gotta wait a whole year. Uh, there was a charm that involved drawing vertical lines on parchment while touching the painful tooth with one's finger. Um, you could try the beak of a magpie hung from your neck.

Justin: [snorts] Sure, yeah, why not.

Sydnee: Uh, you should prick a many-footed worm which rolls up in a ball when you touch it with a needle. So a roly-poly bug, I'm assuming.

Justin: I'm assuming—in the technical, zoological... name.

Sydnee: [laughs quietly] [serious voice] "The roly-poly bug."

Justin: [serious voice] "The roly-poly bug."

Sydnee: Or potato bug? That one?

Justin: Sure. Pill bug.

Sydnee: Pill bug.

Justin: Pill bug is what I always called 'em.

Sydnee: I called 'em roly-poly bugs. [laughs quietly]

Justin: All right.

Sydnee: That's why I'm—

Justin: Again, not a vet, folks!

Sydnee: —I just take care of humans.

Justin: Not a vet.

Sydnee: I just take care of humans. Uh, and then actually you would touch the—so after you touched the worm, the roly-poly bug, you would touch your tooth with that same needle, and it—that was in that transference. Remember

we've talked about that idea that you could... It was the same idea as why you would strap a chicken to your plague bubo.

Justin: Sure.

Sydnee: To your big, infected, plague lymph node.

Justin: It would absorb it. It would—

Sydnee: The chicken would get the illness.

Justin: —'osmose' the illness.

Sydnee: So if you touch the—what you were trying to do was kill the tooth worm.

Justin: Hmm!

Sydnee: You were transferring the pain from the tooth worm to the other worm.

Justin: Nice. Smart.

Sydnee: And then the tooth worm would be still.

Justin: Smart.

Sydnee: And stop hurting you. There was no tooth worm. Again, I'm gonna keep saying that. There is no tooth worm.

Uh, the treatment of the tooth worm would vary. Sometimes you would try to smoke the worm out—

Justin: [laughing] Nice.

Sydnee: —by—

Justin: Hey, worm! What's up, worm! We're gonna smoke you out!

Sydnee: [laughs quietly] You would heat some beeswax and henbane on a piece of iron, and then just try to direct that to the cavity. That'd be hard to do.

Uh, and then you could fill the hole with—um, henbane is actually a mild narcotic, so this probably did help somewhat with the pain. Um, there were other things you could take. There was a candle of sheep suet was a popular treatment, and you would try to burn it near the tooth, and then the thought was that—and then hold some water under it, and you'll watch the worm drop out—

Justin: Ugh.

Sydnee: —into the water. I can't—you would think the first time that didn't work, that would be the end.

Justin: You would think that about ear candling, too, yet here we are.

Sydnee: It never is. Um, and then if everything else failed—we've talked—we did a whole show on tooth extraction, so I didn't want to belabor that too much. There's a—if you haven't listened to it, I would rec—it's a wild history of our, uh—we would not just take teeth out. If you haven't listened to it, let me mention.

You would go to someone, and they probably had no sort of credentialing. I mean, there were dentists and things who were—who knew how to take care of teeth, but a lot of the people who would extract teeth were just, like—

Justin: Folks.

Sydnee: Yeah.

Justin: Just folks, like you and me.

Sydnee: Just people, and they would do it, a lot of times, in public, and you would pay to come watch—

Justin: Oh, yeah, yeah-yeah-yeah.

Sydnee: Yeah, someone extract teeth. And they would do it to like, carnival music, and they would—it would be quite showy, and they would rip your teeth out. And they often would do a lot of damage, 'cause they didn't know how to do it, and they were doing it for show.

Justin: Sure.

Sydnee: Um, I always thought—I do think it's an interesting point. After they pull your teeth out, you would have to buy them back if you wanted to keep 'em.

Justin: Oh, fun!

Sydnee: Yeah. They would keep your teeth unless you bought them, and the reason you might—'cause you're thinking, like, "Why would I buy my tooth back?" Well, one, you might wanna try to hold it in place. They would do, like, a makeshift bridge at the time. Some doctors and dentists would, to try to like, keep the tooth in place.

The other thing is, there was a belief that if you died without all your teeth that you would have to spend resurrection day gathering them back up.

Justin: And that's a hassle.

Sydnee: So you wanted to keep—you wanted to die with all your teeth at your side, at least, if they weren't in your mouth.

Uh, the big breakthrough in filling teeth was dental amalgam. Um, because for a long time we were using gold, and that's kind of pricey, right?

Justin: Yeah.

Sydnee: Uh, so dental amalgam was first used probably as far back as like, 700 CE.

Justin: Wow.

Sydnee: It's a long time ago. Uh, by Chinese doctors, who first mentioned using some sort of... An amalgam is mercury mixed with a metal alloy.

Justin: Hmm.

Sydnee: That's—that's basically what it is. Uh, so anything like that. And there's mention of the use of some sort of silver mercury amalgam, a very long time ago. Um, the modern use probably started in France, and there was—again, it was a silver paste sort of material that was being used. Some sort of, again, amalgam.

And this was brought over to the United States by the Crawcours brothers in 1833. Uh, when they first started doing this, they were actually making it by mixing, like, shaved French silver coins, um, with mercury, to make the amalgam.

The problem is, the Crawcours brothers brought this to American dentistry. Uh, they called it the Royal Mineral... Succedaneum... 'Scadanium'... Anyway. It was the introduction of, of amalgam to the United States, and a lot of dentists thought this seemed like a good idea, because you could put this in there, it would harden, it was very durable, it lasted... I mean, a very long time, and it was easier to work with and easier to find than gold. So, this seemed to make a lot of sense to people, this use of amalgam.

The problem is, the Crawcours brothers were not dentists. They had no idea how to fix teeth. They got this idea from France. They brought it to the US. They were good at marketing it, good at selling it, but they weren't actually good at doing the dental procedure.

Justin: Excellent.

Sydnee: So, because they weren't properly preparing the tooth by removing all the decayed material, and they weren't putting it in the right way, they were causing people a lot of problems. It led to a lot of pain, a lot of gum disease, all these issues from it. It actually gave amalgam a really bad name.

Justin: Oh, right. That makes sense.

Sydnee: Even though it was probably... They actually also weren't brothers. They're always called brothers. It was like, a... a nephew. It was like, a guy and his nephew.

Justin: Wow, okay.

Sydnee: And uncle and nephew. I don't know. They're always called brothers.

Justin: Like LMFAO?

Sydnee: Um, anyway, so because of them, amalgam got this really bad name, and it led to what was known as the amalgam wars.

Justin: Wow.

Sydnee: There were, like, a faction of dentists who were using this amalgam and saying, "Look, if you use it properly, it actually works really well." But then there was the overwhelming majority of like, the dental society, who said, "No, no, no, no, no. This is malpractice. You can't use amalgam. It's bad."

Um, and it took a long time to overcome the bad reputation of these two guys who brought it to the US, to see that no-no-no, it's not the amalgam's fault. It was being used improperly. The amalgam is actually a good idea.

So in 1877, there was a big organized movement where dentists were coming forward and saying, "No, this is actually a good idea. I'm doing all these tests, I'm studying it, I'm showing ways to make it that are easier and better," and all this kind of stuff.

And it eventually was in the later half of the 1800's into the early 1900's that a lot of the other dentists started getting on board. And this would actually lead to the formation of the American Dental Association.

Justin: Oh, wow.

Sydnee: Of the dentists who came together and said, "This is a good thing! We just have to use it appropriately."

Um, if you're curious, to make a dental, um, like, amalgam in the office, there's actually like... There's a powder that contains the silver, tin, and the other metals, and there's some liquid mercury, and they buy theses capsules.

Justin: Oh, wow.

Sydnee: The dentists do, and they contain the powder and the liquid, but they're separated. So, in the office, they have to like, puncture the cap—they have to puncture the membrane and like—

Justin: Mix 'em all up.

Sydnee: —mix 'em.

Justin: Wow, that's cool.

Sydnee: Which is kind of cool. Um, which means that for dentists, they have to be really careful how to handle these, because they have mercury in them.

Justin: Sure, yeah.

Sydnee: Now, once the mercury gets mixed and it becomes the amalgam, it's no longer toxic.

Justin: Oh, okay.

Sydnee: So once it's mixed together it's okay, but since they are handling the—

Justin: The raw—the raw stuff.

Sydnee: Yeah, the liquid mercury, they have to be careful. Um, I bring all this up because there is a modern concern now about dental amalgams because, as I just told you, they include mercury. And, as you know, ingesting a large amount of mercury can be poisonous.

Now, we are all exposed to mercury in our food and water on a regular basis. Um, actually, more so than you would be from a dental filling. But because of this, and I think also because of this kind of leftover concern about amalgams from their early introduction, there's a lot of skepticism and concern about like, "Now, this is mercury and metal. Should you really be putting this in your mouth?"

So, in 2009 the FDA did a huge review of amalgam fillings, mercury fillings, and looked over all the evidence and all the cases and all the studies, and everything that showed, is there—you know, is there any danger from these fillings or not? And in 2009 the FDA issued a white paper and said, "No. We have no evidence that this is dangerous. We have no evidence that you should be avoiding these. They appear to be perfectly safe."

The amount of mercury vapor—'cause that's what you're concerned about, is that over time these fillings would release mercury vapor, and enough to become toxic. What they found is that they release so little, it's not enough to actually do anything to you, and again, you're actually getting more from food and water sources and other things. Other things out in the environment, you're getting more mercury exposure than you're ever gonna get from your mercury fillings.

So they've said that they're safe for—everybody over the age of 6 can get an amalgam filling. Um, even pregnant people, 'cause that was a big concern. Mercury and pregnancy is always a big concern.

They said, "Generally, we recommend that unless you really have to get some dental work done you just wait until after the pregnancy's over," that's generally recommended, but if you gotta get one, it's still probably fine.

Justin: Probably fine? Or definitely—

Sydnee: It's still fine—

Justin: It's fine.

Sydnee: I should say. It's still fine. Uh, we—we have no evidence that these fillings are dangerous to you. There have been about 100 reported cases, total—

Justin: Ever.

Sydnee: —of allergies to mercury, of people who've gotten fillings and had allergic reactions. So if you have a known allergy to this, you probably shouldn't get it, um, but other than that, there's really no reason why you shouldn't get an amalgam filling.

You'll find a lot of questionable medical sources on the internet, and dental sources that will tell you that your fillings, if you have them, are the source of every medical problem you have.

Justin: Of course.

Sydnee: That all your aches and pains and your—uh, if you have mental illness or if you have any sort of inflammatory, auto-immune—anything like that, they will tell you it is because of the secret mercury poisoning from your fillings, and you should go have them removed.

There is no evidence to back that claim, and dentists would tell you, there is no reason to have your fillings removed unless like, they're broken or they need replaced, and the dentists has told you they need replaced. Uh, there's no reason to get your silver fillings out and put in the newer ones.

Which, uh, there is that option now. They have the composite resin fillings, which is—like I alluded to, that is what I got. I didn't ask for that. They just—

Justin: Did it.

Sydnee: Did 'em. They just put 'em in there. They said they thought I'd want a better cosmetic [snorts] result. I'm really fine. I don't... They're teeth. It's fine. Like—

Justin: It's okay.

Sydnee: As long as I'm healthy, I don't care. But, uh, they do look... The newer composite resins do look like teeth. Like, they're white, so some people prefer 'em for that reason. There's been some question if they're quite as durable as the amalgam fillings. The amalgam fillings may last a little longer.

The composite fillings can still do well, but it may be that if you want something that will last as long as possible, you'd wanna go with the amalgam filling. It is silver, if that bothers you. I don't know.

Justin: I think it looks cool. I got a mouth full of it, baby.

Sydnee: Um, you can still get gold, if you want those.

Justin: Heck yeah!

Sydnee: I do think it's cool—do you know—so, when they were putting in my fillings, they shined that blue light in my mouth. Do you remember that?

Justin: Yeah, she said it was light-cured.

Sydnee: It's how they set the resin, is with—a certain wavelength of blue light sets the resin, because of the—

Justin: It was wild. It was just like—it looked like a blue—like they were just shining a blue flashlight in your mouth.

Sydnee: Mm-hmm. It's not—they used UV light initially. Now they don't use UV, it's just a certain wavelength of blue light.

Justin: [whispers] Wild...

Sydnee: And it—and it interacts with the—they're these glass ions, and... Anyway, it interacts with the composite resin filling to set it.

Justin: That's cool.

Sydnee: Um, yeah, it's really cool the way they do it. Uh, but you can get those—but the point is, there is no reason to fear amalgam. It works fine, unless you have a known allergy. It's cheaper, and maybe more durable. Um, I can imagine if it was right on like, the front of my tooth or something, I might want it to be the composite resin.

Justin: Sure, sure. Yeah.

Sydnee: But if you hear people on the internet telling you to go get your fillings removed...

Justin: It's a lie!

Sydnee: Don't—[sighs] don't listen to them, please.

Justin: Don't listen to 'em.

Sydnee: They're—that is not the problem. If you are having medical issues, go see a doctor and get evaluated.

Justin: See a doctor and get rid of it.

Sydnee: It is not your fillings. It is not your fillings.

Justin: Uh, folks, that is gonna do it for us this week. Thank you so much for listening to our program. We hope you have enjoyed yourselves. I want to thank The Taxpayers for the use of our song Medicines as the intro and outro of our program. Thanks to Max Fun Network for having us as a part of their extended podcasting family, and thanks to you, for listening to our show! We hope you have enjoyed yourself. If you could take a moment to subscribe to the show and, uh, rate it on iTunes. Uh, that would really be helpful for us.

Sydnee: And thank you for encouraging me to go to the dentist.

Justin: Yes.

Sydnee: Thank you, everybody who emailed me and tweeted at me and Facebook messaged me, and Justin, thank you. I'm glad I went. Everyone should go. Go for your regular dental checkups. Your oral health is just as important as the rest of... your health. All of your health.

Justin: All of your health.

Sydnee: So take care of your teeth. Go see your dentist.

Justin: And, uh, come see us next week, as we record another episode of Sawbones. 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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