

## Sawbones 183: Fluoride

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**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 Tyler McElroy.

[audience cheers]

**Sydnee:** And I'm Sydnee Smirl McElroy.

[audience cheers louder]

**Sydnee:** [cackles]

**Justin:** That's some—

**Sydnee:** Thank you, thank you, thank you.

**Justin:** That's some cold stuff, Columbus. Dang.

**Sydnee:** You know why. I was wearing my official badge and you weren't.

**Justin:** Yeah, her official staff badge.

**Sydnee:** I wanted to make sure that people knew I—

**Justin:** No one harangued you.

**Sydnee:** That I wasn't, like, just wandering around back there eating peanut butter and drinking beer with no reason.

**Justin:** Hey.

[beat of silence— audience laughs]

**Justin:** Hi— Uh, what's you guys' favorite part of COSI? Is it the time tunnel? 'Cause I think it's the time travel thing. That's my favorite.

[audience clamors]

**Justin:** It— Yeah. I'm hearing a lot of people just saying random things and—

[audience laughs]

**Justin:** I completely agree with all of you.

**Sydnee:** I love COSI, it's a magical wonderland that I got to go to very rarely when I was a child in Huntington, West Virginia. They would take us here, to Columbus, to see COSI...

**Justin:** To see COSI.

**Sydnee:** ...and it was beautiful and amazing and I love COSI. We're *here* and I feel like we have to go to COSI tomorrow because, I mean, we're here.

[audience claps]

**Justin:** They would bring us to COSI and they would say, "Children, this building is where the first Wendy's was."

**Sydnee:** [laughs]

[audience laughs]

**Justin:** "Can you even imagine? Click, click, click. That's where it was, right there."

**Sydnee:** [though laughter] "Here's a unicycle that you ride on a wire."

**Justin:** Amazing. Uh, so, we love Columbus. We come to Columbus a lot for— to go to COSI. Um, but—

**Sydnee:** And also, growing up in Huntington, for like concerts.

**Justin:** Yeah.

**Sydnee:** And stuff. Like, this was the cool place where cool stuff was happening, it was Columbus.

[audience claps]

**Justin:** But Columbus is so much more than COSI which so many people forget, from Huntington.

**Sydnee:** [laughs]

**Justin:** Did you know, for example, that Columbus was the destination of the very first ever cargo flight?

**Sydnee:** [laughs]

**Justin:** It's true! They were transporting silk.

**Sydnee:** If you're saying you knew that, you were lying.

**Justin:** Yeah, you— Nah, I think they probably knew. They were transporting silk. Which, if you imagine planes back then, that makes a lot of sense. Like, "Hey, I wanna do the first cargo flight."

"What do you wanna bring?"

"Something light."

[audience laughs]

**Justin:** "Planes are bad. None of us trust them. Silk? Perfect."

**Sydnee:** What other facts do you know about Columbus?

**Justin:** Columbus is the home of, uh, America's first water filtration system. Columbus.

[audience cheers a little]

**Sydnee:** That's important!

**Justin:** Yeah.

**Sydnee:** Clean water!

**Justin:** Clean water, so cool.

**Sydnee:** Yeah, no bacteria, no parasites. That's great.

**Justin:** Yeah.

**Sydnee:** Do you like clean water? [laughs]

**Justin:** Yeah, I do, actually.

[audience laughs]

**Justin:** I never really thought about it, Squid, but you're right. I do like my water clean.

**Sydnee:** You know what doesn't clean water, but is always something we add to water that makes water better?

**Justin:** Soap.

[audience laughs]

**Sydnee:** Well. Yes. But—

**Justin:** Oh, wait. No, I know this. I know this. I know this. Crystal Lite.

[audience and Sydnee laugh]

**Justin:** Or Propel? Is Propel the thing now?

**Sydnee:** You might know it by the name H2Flow.

**Justin:** Right. Fluoride.

**Sydnee:** Fluoride.

**Justin:** Fluoride.

**Sydnee:** That's right. Fluoride is something else we add to water, if you like that segue. Fluoride is something else we add to water that's really important.

**Justin:** There we go. Uh... what's fluoride?

**Sydnee:** [laughs]

**Justin:** Here's what I know about fluoride.

**Sydnee:** Okay.

**Justin:** Um. I used to put, uh— Did you all do this? Have the foam thing that they would put the goop in at the dentist and you would bite it for like, 20 minutes?

[audience clamors]

**Sydnee:** Who did the—

**Justin:** [through laughter] I'm so relieved to hear that you all did that too, because if not? Like, I need to talk to my dentist emergently.

[audience laughs]

**Justin:** There needs to be a cold case investigation reopened into Dr. Judith Woodruff and her practice of just, like, pumping juicy foam into kids' mouths.

**Sydnee:** But who did the school-based fluoride programs? Where you had to like— They would bring, like, the tray, like, "Here are your shots of fluoride, children." And you would like, do your little shot and swish it around and I always felt like, "This is great! This is a special day! This sucks. But it's a special day, because it's different, I guess? I don't know!" You never did that?

**Justin:** Yeah, it's very *One Flew Over the Cuckoo's Nest*, I think.

**Sydnee:** So, fluoride is a naturally occurring mineral. It's in rocks, but it can get into air and soil and water, which is why it's important. And the reason we talk about it is that when you have acid from bacteria— So you got sugar in your mouth because you eat it. We all eat sugar, right? We're all eating sugar. Even if you don't know you're eating sugar, you're eating sugar.

**Justin:** Only on Saturdays.

**Sydnee:** There's sugars everywhere. You're eating sugars even in your beans.

**Justin:** Only on Saturday— Oh!

**Sydnee:** Even in your beans, there are sugars.

**Justin:** There's some bean sugar, I'll admit. But it's very slow, it's a slow-carb, Sydnee, you understand.

**Sydnee:** So, bacteria eat the sugar and we get acids in our mouth and those acids eat away at the enamel on our teeth. And fluoride helps to build that back up, so that's where fluoride comes into play in dental health. Now, we didn't know that for a really long time.

**Justin:** How long?

**Sydnee:** Uh, until the early 1900s.

**Justin:** Wow.

**Sydnee:** Which is like, really recent. Especially for our podcast. We're usually talking about, like, ancient Greeks and Romans and right now we're talking about early 1900s is when we figured this out. But the first time we connected fluoride to teeth was actually in a really unhealthy way.

The first connection between fluoride and teeth was a very bad one.

**Justin:** [dramatically] Go on!

[audience laughs]

**Sydnee:** So, it's 1901.

**Justin:** It's not.

[audience laughs]

**Sydnee:** No. Well.

**Justin:** Nice try! Try to gaslight me.

[audience laughs]

**Sydnee:** Drink some more. It's 1901. [makes flashback sound effects] And a dental student named Frederick McKay has— He's finished dental school and he's decided he's going head west, young man, he's going to go out there and seek his fortune and his future in dentistry and he's going to Colorado Springs to start his first dental practice.

And he gets there and he thinks, "I made a great choice because everybody here seems to have brown teeth. And that seems like a great place to start a dental practice."

**Justin:** Yeah, for sure.

**Sydnee:** 'Cause there are a lot of jacked up grills in Colorado Springs at this point in history. I mean lots of brown teeth. *Brown* teeth.

**Justin:** Okay.

**Sydnee:** Okay. You got that?

**Justin:** Yeah, brown teeth, I'm with you.

**Sydnee:** Yeah, so many people have brown stains on their teeth, so much that some people look like their entire teeth were coated in chocolate, as he writes.

**Justin:** Eugh! Syd!

**Sydnee:** Especially kids. Especially the children in the town of Colorado Springs in 1901 look like their teeth are coated in chocolate, twenty-four sev. All the time.

**Justin:** Ugh.

**Sydnee:** So if you're a dentist, you're like, "Jackpot! I've picked the right place."

**Justin:** Maybe, except like, I wouldn't say your values necessarily align with this populace. Like, the first guy that gets his teeth cleaned in the town where everybody's teeth are brown, is like, "Wow, you really ruined it for everybody, I guess, Todd. I guess we all got to get our teeth cleaned now. Thanks, Todd. Real cool man. Thanks."

**Sydnee:** But here's the thing, he started seeing these people and it didn't just come off with a brush. And he started reading in his dental books. Now I



have none of these and I don't know anything about teeth. There's my— I read about this, but I'm a doctor. We don't know about teeth. I've said this before on the podcast.

**Justin:** Sure.

**Sydnee:** But it's the— God's honest truth. In medical school, I feel like it's a monopoly that dentists have, where they're like, "Don't teach doctors about teeth. We don't want them messing in teeth. That's our area. Don't—"

So I mean, he had dental books. I don't. He read them. I haven't. He still didn't find anything about brown teeth, so he still didn't know why, even though I scrub and scrub and scrub, and brush and brush and brush, all of these people in Colorado Springs have brown teeth.

So, he still couldn't figure it out. Even some of the local livestock, like cows and sheep and horses had brown teeth. They called it copper teeth in the livestock. It had nothing to do with copper, I have no idea why old timey people name things old timey things.

But [laughs] there you go. It had nothing to do with copper, but even some of the livestock had brown teeth. And if you asked the locals, like, "Hey, you, why do you think everybody has brown teeth?" They would say things like, "Well—"

**Justin:** Magic.

[Sydnee and the audience laugh]

**Justin:** It's 1901. Probably, like, somebody ran over somebody everybody thought was a witch with their carriage or something.

**Sydnee:** No, they would say things like, some of the common thoughts were, "You know, it's the water. There's a lot of calcium in it. Uh, we eat a lot of pork out here. It's probably the milk, 'cause it's kind of low quality." Et cetera, et cetera.

**Justin:** Mm-hmm.

**Sydnee:** That's it. And nobody had any good idea about it and there had been reports other places at this point in history, so there were places in like, Durango, Mexico where people were getting brown teeth and they said, "Well, it's probably something in the water." In Naples, Italy, so that far away, the locals said, "Well, we have brown teeth, but it's probably just all the volcanic ash and dust."

**Justin:** They probably make it look good, too. That's irritating.

[audience laughs]

**Sydnee:** You know they do.

**Justin:** You know they do.

**Sydnee:** You know they do.

**Justin:** So continental.

**Sydnee:** They're so cool with their brown teeth, and they're like, "It's just volcanic ash."

**Justin:** And the little scooter— Like, they can sell those scooters. Like, I think— They can make a Vespa look cool, like, I think they can sell brown teeth.

**Sydnee:** And we're like, "What's wrong with your teeth?" And they're like, "Ugh. Stupid Americans."

**Justin:** [French accent] "Americans. Nothing is wrong with them!" That's a French guy, but like...

**Sydnee:** Yeah, that's not—

[audience laughs]

**Justin:** There's no way for me to do an Italian that's not gonna sound like Mario.

**Sydnee:** Whenever you go into your "stupid American" accent, it's a French one, so that's okay.

**Justin:** Yeah. [French accent] "Stupid Americans."

**Sydnee:** So, he read these reports and he thought, Dr. McKay, and he thought, "Well, none of this really makes any sense. It still doesn't explain why all my patients have brown teeth." So he decided this was a whole new clinical entity that had never been discovered before and he named it, of course, the very clever Colorado Brown Stain.

[Sydnee and the audience laugh]

**Justin:** [deep voice] "Hey everybody, my name is Colorado Brown Stain and we're gonna play some saxophone music for you tonight. Everybody get real comfortable, here's my first song—" [laughs uncontrollably, smacking the table] "Colorado Brown Stain. I'm gonna lay it down for you, real smooth, here we go." [imitates saxophone]

**Sydnee:** [through laughter] The other name that he tried for it later was Rocky Mountain Mottled Teeth, but it never caught on the way that Colorado Brown Stain persisted, as you can imagine. And he tried to get national attention for this, but everybody was like, "Listen—"

**Justin:** "That's a bad name."

**Sydnee:** "If there was a disease, like if everybody's teeth were turning brown we'd know about it all over the U.S., so this is not something that's real. It's like in a few people." And so he said. "Well, you know what? I'm gonna do a study with local dentists to try to prove that this is a problem around here."

So he started this kind of just like, survey with local dentists, like what is the scope of this illness? And at the end of it he found that 90% of the kids born in Colorado Springs had brown teeth.

**Justin:** Okay.

**Sydnee:** Like, that's a lot of kids with brown teeth. And so he published these results, like, "Listen, maybe not all the adults have brown teeth, but we've been studying and now all these kids who are brown in Colorado Springs are growing up, they get rid of their baby teeth, they grow their permanent teeth and they're brown, in 90% of them, and what's going on?"

And he used this statistic to lure a luminary of the dentistry world to Colorado Springs. Of course you know I'm talking about Greene Vardiman Black, G.V. Black. Obviously.

**Justin:** Wait, what?

**Sydnee:** Everybody's heard...

**Justin:** Sorry, one more time?

**Sydnee:** ... of G.V. Black.

**Justin:** What's the name?

**Sydnee:** Greene Vardiman Black.

**Justin:** Okay. That's good.

**Sydnee:** That is his given name.

**Justin:** That's the bad guy from those *Series of Unfortunate Events* books, right?

[audience laughs]

**Sydnee:** He was— You're not a dentist. If you were—

**Justin:** Guilty.

**Sydnee:** If you were, you would know this name because he is just a giant in the dentistry world. He invented one of the first drills, I mean he was really one of the fathers of modern dentistry. This guy devoted his entire life and career to dentistry. So, for Dr. McKay to get Dr. Black, Dr. G.V. Black...

**Justin:** It's a big get.

**Sydnee:** ... to come out to Colorado Springs and look at these kids with brown teeth was a huge deal. Trust me.

**Justin:** I'm gonna take your word for it.

**Sydnee:** I'm not a dentist but I know that this was a big deal, because he was a big deal dentist and researcher. He comes out and initially, like, he had invited him before. This wasn't the first invitation, but he was like, "I'm not coming to Colorado Springs. I'm kind of a big deal. I don't know if you've heard of me. I'm G.V. Black. Someday Sydnee's gonna say I'm a big deal and Justin's gonna be like, 'whatever,' but it's true."

[Justin and the audience laugh]

**Sydnee:** But finally, he came out because he was like, "90% of kids have brown teeth? Well, okay. I could do something with this." So, he came out and they started studying the problem together and they had a lot of trouble trying to figure out why. I mean, they figured that this was a problem, a lot of people in Colorado Springs have brown teeth, mostly children, and they had zero clue as to why.

And they studied that until Black's death in 1915, which didn't give them an answer, but they did come up with a couple really important observations during this time period. So, number one. The first was that it mainly seemed to happen to young children, people who were born there who had not yet developed their permanent teeth.

So if you were— If you moved to the area, you were much less likely to develop it, but if you grew up In Colorado Springs, it seemed to be something so in-born or something like that. Something with your

developmental process. The second thing they noticed is that whatever made these teeth brown also seemed to make them resistant to decay.

**Justin:** Okay.

**Sydnee:** So they looked bad—

**Justin:** It's like armor.

**Sydnee:** Right. So they looked bad, but they—

**Justin:** They felt great.

[Sydnee and the audience laugh]

**Sydnee:** They were actually super healthy teeth and they kept noticing that, like these kids would have teeth that were really jacked up, but they would, you know, examine them and go, "Well, you've got no cavities."

**Justin:** Amazing.

**Sydnee:** So, whatever is making their teeth so brown seems to be making them healthier.

**Justin:** Kind of a deal with the devil, though, if you think about it. Like, no cavities, *but* there's this one thing.

**Sydnee:** It looks like you just Willy Wonka'd it out, all over your teeth, all over—

**Justin:** Yeah, Augustus Gloop Teeth

**Sydnee:** [laughing] It's called the Augustus Gloop Disorder. All over your teeth, all the time. So, McKay had some theories as to what could be causing it, but nothing concrete. In 1923, there was a case in Oakley, Idaho that really helped him break through.

So, the town contacted him because they knew the studies he had already done in Colorado Springs and they said, "Listen, we have kids that have started developing these same brown stains as the kids in Colorado Springs had and we don't know why."

And so, he went there, to Oakley, Idaho, and he started studying and—

**Justin:** You know he was like, "Oh, you mean Colorado Brown Stain?"

"I'm not actually gonna say it out loud, but yes. But I'm not gonna...."

"Just say it once."

"I'm actually not gonna say it."

**Sydnee:** So, he went to Idaho and he studied the kids and he couldn't find anything, but then they said, "You know, when this all started is when we built a new communal water pipe. We needed clean water into the community and so we built this big pipe system from one of the local hot springs and it pumped water into the community and ever since we did that, the kids born in the community have developed these stains."

And he said, "Well, listen. I tested your water." With the means he had at hand. He couldn't find anything wrong with the water, but he went, "You know what? You should probably stop using this water. I don't know what it is, but this is the source."

And they said, "Okay, fine." So, they stopped using this pipe, they went back to old methods of water. Over time—"

**Justin:** Their teeth fell out.

[audience laughs]

**Sydnee:** No— [laughs]

**Justin:** All their teeth fell out.

**Sydnee:** No more kids are born with Colorado Brown Stain.

**Justin:** Okay.

**Sydnee:** So, this is the first clue where whatever the problem is, it's in the water. So now we know this. He had suspected it, but now he knows for sure it's in the water. And at the same time, as you see with like these kinds of research studies, like, this research is being done in the U.S., everybody's really excited about it, everybody's really interested, and at the same time you could echo, like, studies are being done in the U.K., studies are being done in Italy that kind of show the same results.

Like, "There's something in the water. We don't know what it is." And we finally figured it out when it happened again in a place called Bauxite, Arkansas.

[audience laughs]

**Justin:** That's a whole lot of name.

**Sydnee:** Bauxite.

**Justin:** Bauxite.

**Sydnee:** Bauxite, Arkansas is a town that was essentially owned by the Aluminum Company of America.

**Justin:** Oh, my God, I thought you were gonna say "illuminati," I was so excited!

[audience laughs]

**Justin:** Dang it!

**Sydnee:** No, I'm sorry.

**Justin:** I just had one sec, I was like, "Oh, is she gonna...? Are we gonna go...? Oh. Aluminum. Fun."

**Sydnee:** Not that exciting.



**Justin:** And there's one person who's in the Illuminati in the crowd tonight who was about to be like, "That's my boys!"

[audience laughs]

**Justin:** You all— I'm on to you, by the way. I saw you with a fist raised, I got your number.

**Sydnee:** The Illuminati do play a role in this story, but not yet.

**Justin:** [yelling] Are you kidding me!? Go faster!

[audience laughing]

**Justin:** These people got to get home and I got to hear about the Illuminati!

**Sydnee:** [laughs]

[theme song plays]

[ad break]

**Sydnee:** So, Bauxite, Arkansas. It's this tiny, little town. It's mainly owned by this aluminum company. It's where they produce and, whatever, process aluminum in their giant factories and they had recently been under a lot of scrutiny for suspected problems in the water and the soil from aluminum. There had been a lot of questions in the media recently from what does having this giant aluminum factory do to the health of the townsfolk?

So, now in this same town where we have all these concerns about aluminum, all of a sudden, we have these brown stains on kids' teeth. So as you can imagine, there was a lot of attention, a lot of doctors and public health service officers and media attention focused on this town. Is it the aluminum? That was the big question.

So, first of all, Dr. McKay shows up, a health public health service officer named Grover Kemp, go and they investigate. They analyze the water and you see their tools, they again, they can't find the source. But they're not

using the best ways of analyzing water at the time. They're looking for very obvious bacterial infections or, you know, toxins. But they don't have all the ways that we do now analyzing water.

Well, guess who does? The Aluminum Company of America. They have the—

**Justin:** [yells] Man! You got me again!

[audience laughs]

**Justin:** I thought for sure that time!

**Sydnee:** No, not the Illuminati.

**Justin:** "You know who *does* have water testing that would put all that to shame?"

**Sydnee:** So they do this purely to cover their butts. They say, "I don't know what's going on, but I sure hope it's not aluminum. We got to test this water and figure out if it's our fault so that we can do some damage control." And they start testing the water and what they find with their more sophisticated equipment is that the water in Bauxite has incredibly high levels of fluoride.

**Justin:** Mm-hmm, there he is.

**Sydnee:** Not aluminum.

**Justin:** Only took us 25 minutes and we got that culprit.

**Sydnee:** At the time, they thought, "Well, this doesn't make any sense, fluoride means nothing, this can't have anything to do with it." So they get new samples, they reanalyze it, and again— And these are chemists. Yes, they work for the aluminum company, but they're chemists. They're scientists.

[audience laughs]

**Sydnee:** You know. I'm a scientist. Like, we're nerdy. We just wanna know the truth. We wanna figure it out. And like, they're like, "Well, this is fascinating. Fluoride in the water? What could this mean?" And so, they do it again and they're like, "More fluoride! This is fascinating!" And so—

**Justin:** You can't see this if you're listening to the podcast later, but Sydnee is hilariously tweaking her glasses.

[Sydnee and the audience laugh]

**Justin:** And it's adorable, but—

**Sydnee:** This is what scientists do when they're excited, straighten their glasses. So, they find all this fluoride and the chief chemist at the Aluminum Company of America writes a letter to Dr. McKay and says, "Listen, I don't know what this means, I don't know why it would have any effect, but here's the deal. You're worried about these brown teeth, we analyzed the water, this is what we found and if you want to get water samples from the other communities that have brown teeth, we will analyze it in our lab and look for the same thing we found here."

And he says, "Yes, I want to do that." They send samples from Colorado Springs, they send samples from Oakley, Idaho. They're our other communities where we've had these brown teeth, they send all these samples to the lab and they find high levels of fluoride.

**Justin:** Mm-hmm.

**Sydnee:** So there you go. Fluoride is named as the cause of all these brown teeth. Now, this could be the end of the story because—

**Justin:** This is raising some obvious questions for me, but go on.

[audience laughs]

**Sydnee:** So, and this takes us all the way to 1930. We're in 1930 now and the National Institute of Health has gotten wind of all these results and they're fascinated by this, and they go, "Oh, my gosh. Well, fluoride in water

can do all these things to tooth enamel, cause mottled tooth enamel that can absorb brown stains more easily and this is very interesting.

But you know what also was really interesting is that it also seemed like all these people with the brown teeth didn't get tooth decay at the right of all of our other citizens. It was a huge problem at the time, people with tooth decay.

**Justin:** Mm-hmm.

**Sydnee:** Everybody's teeth were rotting out of their heads. And so, they said, "You know what? This is really interesting because, I don't know, this fluoride in the water, while it turned their teeth brown, they also seemed to be really healthy brown teeth. So let's start doing some studies to see how much fluoride in water will turn your teeth brown."

So the National Institute of Health did a lot of studies and they found that at one part per million, your teeth are good. They're not gonna turn brown, for the most part. Over that, you might get brown teeth, under that you're gonna be safe. So then they start saying, "So if we know we can put up to one part per million fluoride in water and your teeth won't turn brown, for the most part, what will it do positively for teeth?"

So Dr. H. Trendley Dean, who was working at the National Institute of Health, said, "You know what? Let's start studying what this might do for tooth decay." So he started putting all these different amounts of fluoride in water to see, like, could this maybe... possibly impact tooth decay? And this wasn't, like, a brand new idea.

Like, since the 1800s, there had been theories that like, fluoride pills have something to do with bones. We don't know what teeth are, but they seem like bones.

**Justin:** [laughs]

**Sydnee:** Maybe that might help them in some way? So, you know, maybe if we put fluoride in water this might help people's teeth. So they did a hard sell on a lot of different communities and they finally got the community of

Grand Rapids, Michigan to agree to be guinea pigs and put fluoride in their water for the first time in 1945.

So that was the first time that fluoride was added to the water of an entire city. 1945, Grand Rapids, Michigan.

**Justin:** God, if that had been Columbus, that would have been a great payoff.

[audience laughs]

**Justin:** Dang. Okay, go on.

**Sydnee:** No, sorry. I know, it was Michigan, too. I'm sorry.

**Justin:** Congrats, Grand Rapids. You did it again.

**Sydnee:** I know, I'm really sorry about that.

**Justin:** [simultaneously] Sorry. Sorry.

**Sydnee:** [whispering] Everybody here hates Michigan.

**Justin:** I know.

**Sydnee:** Okay.

**Justin:** I told *you* that.

**Sydnee:** I know.

[audience laughs]

**Sydnee:** You seemed to forget, I was reminding you.

**Justin:** Okay.

**Sydnee:** They were guinea pigs though.

**Justin:** [sarcastic laughter] Take that, Michigan.

[audience laughs]

**Sydnee:** [louder] It could have gone horribly wrong!

**Justin:** [simultaneously] It could have killed them!

**Sydnee:** But it didn't. Over 15 years—

**Justin:** But it could have!

**Sydnee:** Over 15—

**Justin:** If you guys are laughing at that, you sicken me. [laughs]

[audience laughs]

**Justin:** It's just football, guys, calm down, okay? Yikes. We're talking about human life in the balance. That's really disturbing. Go on.

**Sydnee:** I mean, human *teeth*.

**Justin:** Well, human teeth, but it could have killed them.

**Sydnee:** So—

**Justin:** Maybe! You didn't know!

**Sydnee:** I mean, well—

**Justin:** They looked around at a bunch of people with baked bean teeth and they're like, "Well, I don't know. Put some, uh, dirt on— Fluoride? I don't know. Guessing."

**Sydnee:** [laughs] So, over 15 years, they studied the population of Grand Rapids and they found that the 30,000 schoolchildren that they followed had a rate of tooth decay 60% less than the previous generation.

**Justin:** This is still with the one part per million.

**Sydnee:** Mm-hmm. One part per million of fluoride. This is a huge drop. So, 60% drop in the rate of tooth decay. And this is meaningful. I mean I know, like, it sucks to have cavities. It sucks to lose teeth.

But it also sucks to have cavities that you can't have the tooth pulled because you can't afford to have the tooth pulled or that get infected and you get horrible infections from these dental infections, so there are more serious consequences to, you know, bad teeth.

So it's not so big a deal as like, "Well, whatever, we improved kids' smiles. That's great, whatever. So everybody in Michigan's smiling." No, I mean, like, this was a huge deal in terms of preventive health. Like, we did this one thing and now we have a 60% decrease in dental decay. And so the result of that is every community in America went wild. And now we have—

**Justin:** They go bananas for this good stuff!

**Sydnee:** Well, everybody wanted good teeth! Everybody wanted their teeth to stop falling out. So, now, 200 million Americans have fluoride in their drinking water. You probably have fluoride in your drinking water.

**Justin:** Well, that's not all, is it? Why is it not all? Shouldn't everybody have that? It seems good.

**Sydnee:** It just had to be adopted, community by community.

**Justin:** Okay.

**Sydnee:** But no, but no—

**Justin:** We've got it, though, right? We're cool.

**Sydnee:** Yeah, we got it, you guys got it. Most major cities have it. I always ask the question when I'm seeing patients, like, do you have city water or well water? Because city water generally has fluoride, well water doesn't always, but you can add it to well water. I mean like, you can have people come out and add it.

But, uh, 13 million schoolkids still have school-based programs where you get the fluoride rinses, which I still remember from school. Like, the fun day where it was like, "Something new! But it's fluoride! This sucks! Why is this a thing?"

Um, and in addition, the big shift, other than water and these school programs, is that, like, toothpaste, right?

**Justin:** Yeah.

**Sydnee:** Like, fluoride's in toothpaste.

**Justin:** Yeah.

**Sydnee:** So, that was the biggest deal, is that we said, "You know what? If fluoride's so great, why don't we put it in the thing that we put directly on our teeth."

**Justin:** Let's rub it on our teeth, yeah. For sure.

**Sydnee:** That seems like it would make sense. There are other countries who have opted to add it to other things, like for instance, there are some countries where they're like, "Most of our water is used for, like, washing stuff and toilets and so we don't want to put it in the water because that seems like a waste."

So they add it to the salt. So you can get fluoridated salt in some countries. Um, that's really effective when they add it to all salt. When they just add it to some, it's not as effective. Um, and you can also find places where it's added to milk.

**Justin:** Hmm.



**Sydnee:** It's advised by the World Health Organization, water first, salt second, if you can't add it to water. And it costs you, on average, to add fluoride to your water, about a dollar per year. In some communities it's a little more, in some it's a little less. But on average, it costs us all about a dollar a year to decrease the rate of dental decay by about 60%.

**Justin:** Good job, science.

**Sydnee:** Those are pretty good.

**Justin:** I'm proud of you!

[audience cheers]

**Sydnee:** That's a pretty good—

**Justin:** And the end of this story is, everybody thought it was great forever. And they thought, "This is awesome and we love our teeth and it's very cheap. Science is great. Hooray for us."

**Sydnee:** No.

**Justin:** "Let's all ride off into the sunset and enjoy our great teeth."

**Sydnee:** It would be great if that were the end of the story, because it was considered one of the 10 great public health achievements of the 20th century, adding fluoride to water.

And if that were the end of it, that would be great. But the truth is, there's huge controversy and if any of you have scanned the internet about fluoride, you already know this.

[small laugh] Fluoride is named as one of the great big conspiracy theories, probably, of our time. Um, now in some places they haven't added fluoride to their water, not because of these conspiracy theorists, but because—

**Justin:** [dryly] Because they love freedom.

**Sydnee:** No, because—

[audience laughs]

**Sydnee:** They've already added it to toothpaste or salt or whatever and their rate of decay is so low that now that they're considering it, they just don't decide it. So there are some major developed nations that haven't added fluoride to their water because they've already kind of stemmed this problem, so they don't really need it at this point in time.

There are places who have voted, like, "We don't want to add fluoride to our water, 'cause we're independent thinkers."

**Justin:** [snorts]

**Sydnee:** "And we love when our teeth rot out of our head and we'll go to our dentists and whatever."

**Justin:** "We're independent thinkers that hate hard candy."

[audience laughs]

**Sydnee:** And then the bigger thing is that there's a safety fear, there are a lot of people that say, "Well, what is all of this fluoride doing to us?" Well, there have been exhaustive studies by the NIH and by the CDC and by the FDA to try to figure out is there any negative impact on putting fluoride in our water and over and over again, they say, "No. No."

**Justin:** "It's *fine*."

**Sydnee:** There *is* fluorosis which is the condition we talked about at the beginning of the show, which is when your teeth turn brown. This is from excess fluoride in your water. Now at one part per million, there is a very small fraction of the population that could get some very mild degree of fluorosis.

It is a cosmetic problem, solely. It doesn't cause pain, it doesn't cause decay, it doesn't cause any problems with your functioning of your teeth. They still chew on pizza rolls just fine.

[audience laughs]

**Sydnee:** So, it doesn't do anything other than they can get some streaks on them. And even that is incredibly rare. For most of us, fluoride in our water protects us from dental decay, period. Now, that hasn't stopped people from accusing fluoride in our water of all kinds of crazy things.

If you go on the internet you will find that fluoride is the cause of cancer, bone disease, Alzheimer's, kidney disease, effects on enzymes, metabolism, thyroid issues, early puberty, increased allergies, hypersensitivity, fertility issues, genetic disorders, neuro disorders, Down's syndrome, lead poisoning, coronary artery disease...

[audience laughs]

**Sydnee:** ... AIDS, arthritis, ADHD, SIDS, IBS, emphysema, fatigue, flatulence, and... wait for it. Tooth decay.

[audience laughs]

**Sydnee:** None of these have ever been found to be true, in fact you can find the American Dental Association has a 71-page document, PDF file on the internet you can download for free to read how they refute every single one of these claims, one by one, with evidence, with studies, with research to tell you why, no, I'm sorry, fluoride is not the reason you're farting so much.

[audience laughs]

**Justin:** It's hard for me to pick, but I think my favorite is lead poisoning?

[audience laughs and claps]

**Justin:** [through laughter] Like, *absolutely* not, for sure. Like, by definition, not that.

**Sydnee:** In addition...

**Justin:** [laughing]

**Sydnee:** People have said that this is—

**Justin:** "Hey, hey, hey. It's fine. This is me, fluoride. This is my friend, lead. He's with me. Come on in, lead. It's fine. Let as much of him in as he wants, it's fine. You don't need to process him, kidney." Liver? Liver.

**Sydnee:** [laughs]

**Justin:** Right? Liver?

**Sydnee:** [completely confused] What?

**Justin:** What processes toxins?

**Sydnee:** Both.

**Justin:** [explosion sound effect]

[audience laughs]

**Justin:** What's up, Slim Goodbody? I guess I know all the parts in the body now. Student has become the master. Also, blood... is in there. For sure.

**Sydnee:** In addition, you will find whole books written about how fluoride is either a Nazi plot to take over the U.S. or a communist plot to take over the U.S. or maybe a new world order plot? Or perhaps [pause for effect] an Illuminati plot.

**Justin:** There they are!

[audience clamoring]

**Sydnee:** Based on the idea that fluoride in our water makes us, quote, "stupid and docile" and that fluoridation causes slight damage to specific parts of the brain, making it more difficult for the person affected to "defend his freedom" and causing the individual to become more docile towards authority.

**Justin:** I—

**Sydnee:** There are books written on this about fluoride!

**Justin:** Okay. I know this— I mean I know... *something's* going on, right? Like, I know it's probably not fluoride. Something's going on, though. It might be fluoride— Something. I think they've got a point about *something's* going on, for sure. It might just not be fluoride is what I'm saying, maybe.

**Sydnee:** Listen, I'm not saying everything's okay in the U.S. right now. that's not what I'm saying.

**Justin:** Something's going on for sure.

[audience laughs]

**Justin:** It may be fluoride. I don't remember before fluoride. But I've met a lot of people *since* fluoride.

**Sydnee:** I'm not saying everything's okay, I'm just saying—

**Justin:** Our teeth are dope, though, for sure. That you cannot take away.

**Sydnee:** Yeah, exactly.

**Justin:** [laughing] Our teeth are fresh!

**Sydnee:** Whatever's going on in the United States right now, it ain't fluoride, okay?

**Justin:** Yeah. Our teeth are on point.

**Sydnee:** That's not the problem, it's keeping your teeth from decay. It's probably not turning them brown, for the most part. [laughs] There are a few people who are gonna get fluorosis, and I'm sorry in advance, but your teeth are gonna be so healthy.

**Justin:** Yeah, that's super hard, like steel.

**Sydnee:** Even brown. Brown— And with teeth, brown is the new white. It's okay. So...

**Justin:** Yeah.

**Sydnee:** It's totally cool.

**Justin:** So, uh, and it's all thanks to Columbus, if you think about it.

[audience cheers]

**Sydnee:** [cackles]

**Justin:** 'Cause the first—think about it, nobody even thought of filtering water before you guys. That's amazing.

**Sydnee:** Definitely not Michigan.

**Justin:** Before we, uh, leave, I wanna say a huge thank you to William and everybody from the Columbus Podcast Festival for getting us out here.

**Sydnee:** Thank you, guys!

[audience cheers]

**Justin:** I wanna thank Dave Thomas for opening the first Wendy's. I wanna thank, uh, Columbus for having us in the city. For having us.

**Sydnee:** For in— You tell me that in 2013, they were named the most intelligent city.

**Justin:** Yeah, did y'all know that? OH, right?

[audience clamoring]

**Justin:** There it is!

**Sydnee:** You guys—

**Justin:** That's my intelligent, intelligent folks!

**Sydnee:** I know, you were like, "What? I've been drinking a lot that sounds great. Woo!"

**Justin:** [simultaneously] Yeah, for sure, you know how to spell Ohio, do not even trip. Oh, I know. "Oh, what's he— What's that chubby guy saying? OH? I know them."

**Sydnee:** [laughs]

**Justin:** Shoot. That's a little intoxicating. Anyway, um. Uh... thank you to—

[an audience member yells, "OH!"]

**Justin:** No, you can't do it. Only I can.

[audience laughs]

**Justin:** Stay in your lane! You live here all the time! [laughing] I want to thank The Taxpayers for the use of their song *Medicines* as the intro and outro of our program. And thank you to the Maximum Fun network for having us as a part of their family. They have a lot of great other podcasts, like, uh, *Judge John Hodgman*, *My Brother*, *My Brother and Me*, *The Adventure Zone*, and many others. And thank you to *Still Buffering*, *Court Appointed*, for doing such great shows!

[audience cheers]

**Justin:** And uh, folks that's gonna do it for us. My name is Justin Tyler McElroy.

[audience cheers a little, grows into a big cheer]

**Justin:** Stop. You don't know. It'll really mess me up for the entire thing. I'll be impossible to live with.

**Sydnee:** I'm—

[audience laughs]

**Sydnee:** I'm Sydnee Smirl McElroy.

[audience cheers raucously]

**Justin:** Whatever. Whatever! And as always, don't drill a hole in your head! I quit!

[theme music plays]

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