Sawbones 420: Hand Sanitizer

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

[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: I'm surrepti— I keep checking my mustache.

Sydnee: Why do you keep checking your mustache?

Justin: For— cause you—

Sydnee: To make sure it's there?

Justin: To make— you made fun of me 'cause I got a little bit of cream in there. You made fun of me 'cause I got a little—

Sydnee: You just made yourself this little fancy coffee drink, just in the middle of the day!

Justin: It's just an iced coffee.

Sydnee: Well, you made an iced coffee, but then you put a nice little swirl of whipped cream, a fanciful swirl of whipped cream right on the top. [pause] I love that! I love injecting some whimsy into your day.

Justin: Sydnee, I have, uh... uh, a suggestion for you.

Sydnee: Yes.

Justin: Once a day... give yourself a present. Just give yourself a— don't plan for it. Don't wait for it. Just give yourself a present. Today, my little present to me? A little dollop of whipped cream on top of my coffee drink. But now I'm worried it's stuck in my mustache, so I'm having to wipe it off.

Sydnee: It's not.

Justin: My hands— I've made my hands all sticky with, uh— with whipped cream that I've scraped out of there, and I don't know how to get 'em clean. Ugh.

Sydnee: This is my husband. His hands are sticky with whipped cream.

Justin: My hands are sticky with whipped cream, like some sort of bear in a campground!

Sydnee: He is an adult.

Justin: Like a bear that got into the marshmallows!

Sydnee: But his hands are sticky with whipped cream.

Justin: My hands aren't sticky, Smirl! I've opened the door for you. It's a segue, alright? Sheesh! I was trying to make it—

Sydnee: Was that the present you got me? A Segway?

Justin: I wish. I wish we had Segway money. Keep hitting those sponsors, Maximumfun.org/join, and just [wheezes] get that money rolling in so I can finally get my— my wife the one thing she's ever wanted: a Segway.

Sydnee: [laughs] That's not true, by the way. I don't actually— I would definitely fall off. I don't want a Segway. Uh, well, Justin, if your hands are sticky... you might— you might need some hand sanitizer.

Justin: Yeah, that would—

Sydnee: That's actually not the best solution. Washing your hands would be better, but this episode is about hand sanitizer and not washing your hands, so... I see where you set me up there but, like, think about it. When your hands are sticky, if you squirt hand sanitizer on 'em, does that always, like, do the whole job for you?

Justin: No. It— sometimes you might just end up with, uh, alcohol-strewn sticky hands, and that's not good.

Sydnee: Now you have disinfected sticky hands.

Justin: Yeah.

Sydnee: Uh, we've talked about hand washing.

Justin: Yes.

Sydnee: That's done. We did that.

Justin: Old Dr. Semmelweis invented cleanliness.

Sydnee: It's true. We did that one early in the pandemic, uh, because it was relevant, because people suddenly became aware of hand washing. [laughs]

Justin: So glad we're over that, by the way. Ugh! Gross. You know how much I was spending on soap?

Sydnee: No, we are not over that, and we still should be washing our hands. But we didn't talk about hand sanitizer, and we should, because, uh, not so much now but throughout the pandemic it's been a hot item. Uh, a hot ticket item.

Justin: Remember earlier [wheezes] when— when everyone who could make hand sanitizer was? Like, I think Tito's, the vodka people, they were like, "We're using our extra capacity to make hand sanitizer."

Sydnee: A lot of— a lot of alcohol companies converted that, and there were a lot of DIY. We'll get into that. But, uh, hand sanitizer became a hot commodity, and it was hard to get. People were stockpiling it.

Justin: Oh yeah. Like everything else.

Sydnee: Oh yeah. Oh yeah. That and toilet paper. But, you know, it's interesting to think about. Did we always, like, love hand sanitizer so much? Where did it come from? Who came up with it? And was it always the hot commodity that it is today?

Um, so we figured out hand washing. We talked about that.

Justin: We loved it.

Sydnee: And we all got excited about it. But there was an obvious limitation. In order to wash your hands with soap and water...

Justin: You need hands.

Sydnee: Yes, this is one. But you also—

Justin: You need soap.

Sydnee: You have to have soap and water.

Justin: Yeah

Sydnee: And soap was maybe less of a limitation in the sense that, like, well, you could make soap pretty cheaply and easily eventually, a variety of forms, and you could get that out to people. It's shelf stable. You know? So—

Justin: You can rend... an animal. Right?

Sydnee: Yeah.

Justin: Isn't that what you do? You rend an animal to it's—

Sydnee: There's fat involved. [laughs]

Justin: There's fat involved. It's not pretty. [laughs quietly] but it is—

Sydnee: No, I don't wanna get in— we've all—

Justin: It is available.

Sydnee: We've all seen *Fight Club*.

Justin: [laughs]

Sydnee: Um, however, it does require water. And without water, you don't have a great option— well, prior to this— to clean your hands, right? 'Cause you've got soap, but what, you're just gonna rub the dry soap all over your hands?

Justin: Come on. Get real!

Sydnee: Who— also, I don't know if this is, like, a healthcare worker problem or if other line of work you have this common thing where in a room, in an exam room, it is not uncommon to have a hand sanitizer dispenser and a soap dispenser that look identical, except if you read where they say either hand sanitizer or soap.

And sometimes there's a slight color difference in, like, what you can— so, like, a visual. I have, so many times, put soap on my hands, and then stood there talking to a patient while I just continually rub soap all over my hands and thought, "This is not hand sanitizer. This is not hand sanitizer."

Justin: Well, now this is my day.

Sydnee: But now this patient isn't gonna take me seriously if I say, "Excuse me, I've just put soap on my hands."

Justin: [laughs] "I'm a real doctor."

Sydnee: "I wasn't pretending." But even when you have access to water and soap, it also takes time. And that was another problem they found pretty quickly in, you know, maybe if you're prepping for a surgical scrub you've got the time to do a full, you know, real deal— 'cause that's a big time hand washing ordeal that you go through before a surgery. But if you're in, like, a busy ER—

Justin: "They're crash— they're crashing!"

Sydnee: Yeah.

Justin: "Get in here!"

Sydnee: It's just like that."

Justin: "But I— my hands are dirty!"
"It doesn't matter! They don't care!"

Sydnee: No, it does. So—

Justin: "There's no time!"

Sydnee: —we needed a way to clean your hands without soap and water, and we needed a way to do it fast. Um, the idea of alcohol being sort of vehicle for that is an older one. And, like, if you think about on this show, stuff we've talked about throughout medical history that we've used to clean wounds, we've been using alcohol on wounds for a long time, without really knowing why, right?

Justin: Well, it's nice, because it burns when you drink it. And it's one of those rare times where, like, it feels like what it's do— like, you could intuit that. Like, "This is burning my throat. I bet it would burn the germs away."

Sydnee: Well, and we didn't even know about germs.

Justin: I know.

Sydnee: But it's similar. You know, we used to cauterize wounds. We used to literally burn wounds, so why not dump some wine or brandy or whatever on them? Um, and maybe that was doing something. And maybe it was, if there was enough alcohol content it would've been doing something, even though we didn't understand that yet.

Um, in the same period of time where we were kind of understanding sanitation, we're talking about after Semmelweis told us to wash our hands, we're in the

Lister and Pasteur era where all of a sudden we're starting to understand germs and how to kill germs, and the concept of antisepsis, and why that would matter, and why that would keep you from getting sick.

Justin: What's antisepsis?

Sydnee: Like, um, of having a work surface or area, or OR, or hands, or something that is free of germ cause— disease-causing bacteria, or viruses, or germs. Right? That whole concept was coming to light. Um, this is the same period of time where Dr. Leonid Bucholz discovered that a form—

Justin: Sorry, could you say that one more time, just 'cause it was very cute?

Sydnee: Bu— Bucholz?

Justin: Okay.

Sydnee: Bucholz? Bucholz?

Justin: Okay, you're getting there. [laughs quietly]

Sydnee: Uh, discovered that a form of alcohol, specifically ethanol, was a useful antiseptic. It killed stuff.

Justin: E2OH, right?

Sydnee: Yeah. Eth— hey, very good!

Justin: Oh, thank you.

Sydnee: Now, he figured that out, and everybody was like, "Oh, that's kind of cool. We don't quite know what to do with that information yet." Like, that's nice. We know that now.

Um, we need to know, like, how do you apply it to things? Like, what? Just, like, dump it? And then also what concentration of alcohol, right? You know? I mean, we understand that, like, beer versus wine versus vodka, those are all different

concentrations of alcohol. Similarly, how much alcohol do we need in this liquid to do something?

Um, so you see all these studies, especially late 1800's, early 1900's, where they're kind of comparing different amounts of ethanol and, like, dumping them on germs and saying, like, "Did it kill the bacteria? Did it kill the virus? Like, what did it do?"

And what they kind of found is that it seems like somewhere between 50 and 70% was the sweet spot. There was a thought for a while that if you went much higher it would actually have a negative effect, which wasn't necessarily true. I don't know how that... but anyway, at least they knew this is where we need to hit, especially that 70%. We need to hit that in order to kill germs effectively.

Um, now... a lot of times in medicine, when we find that something works for one thing we kind of try to do it for everything.

Justin: You get very excited, yeah.

Sydnee: Right, exactly. And so when we figured out alcohol, ethanol, could kill some microorganisms, we decided, like, well, then it must kill all of them. And this actually set it back for a while, because they found that it wasn't very good for fungus.

Justin: Oh.

Sydnee: And so there was this thought, like, well, it's not— if it can't even kill fungus... why are—

Justin: Not that— that cool.

Sydnee: Why are we chasing this down? Like, why are we continuing to investigate it as this possible antiseptic if it doesn't even kill fungus? Who cares?

It took a while. Research persisted, but it wasn't until 1936 where you see the next breakthrough, where we switch from ethanol to isopropyl alcohol as a better way, as a more effective form of alcohol to kill germs. But at this point, again, it

still— like, we're still just dumping liquids on stuff, right? I mean, like, how else are you going to apply these alcohols?

Justin: And I know it's not that expensive, but there is some waste there, when you're dumping alcohol. It's great alcohol that someone could've used. And you're just sloshing a lot of it down the sink.

Sydnee: Yes. And, like, if you think about, like, if you just dump a big bottle of isopropyl alcohol on your hands, it will dry on its own but, like, if you're in a hurry, you still gotta dry it. So this wasn't— this wasn't gonna catch on. And especially at that point, hand washing had really— like, the idea of the proper surgical scrub— so, before a surgeon and everyone else involved in the OR, not just the surgeon but everyone else who's going to assist, performs a surgery, they do a full scrub. Do you know what the difference is between that and, like, hand washing?

Justin: Um... ye— ye— well, it'd be you scrub... in... and you are clean. But you can't touch things afterwards.

Sydnee: Yes.

Justin: You have to keep your hands free, and then I'll just see 'em walk around with their hands in the air.

Sydnee: Do you remember in the NICU they had that sink with the little sponges set up that you had to wash your hands at when you came in and out?

Justin: Yeah.

Sydnee: It's similar, but more so. Um, there are specialized— like, if you into an OR now, a modern OR, you're gonna have, like, a big sink. And you've got these little scrubs, these little sponges with a sponge on one side and, like, a bristled brush on the other.

Justin: So you can get underneath your nails.

Sydnee: So you can really, like— you're gonna wash all the way up to both elbows, thoroughly wash, like, every square inch of hands, all the way up to the

elbows. You have the brush with bristles that you can use, but you also get this little, like, pick thing to clean out from under each nail as you go.

So you do all of that, and rinse everything, and then that's a full surgical scrub. That concept had already been introduced by now. So we kind of have this gold standard that we're up against of, like, "This is how to become clean."

Justin: [laughs quietly]

Sydnee: [laughs quietly]

Justin: "Prayer."

Sydnee: Now, the story of how we get from— we understand alcohol can do this. We are still washing our hands, but we need something better— or not better, but something... that would work in a pinch. Um, the story of how we get from there to hand sanitizer is— it's funny.

I found this, like, mentioned several places on the internet, and then at the same time that I found this, like, "Where did hand sanitizer come from?" Where I found this answer, I found immediately people saying, "We don't think this is true."

Justin: [laughs]

Sydnee: So this story is probably apocryphal. Um, I say "probably" because there's always a chance we'll find something out. Um, but the story that you may have seen, 'cause I think it was, like, tweeted around earlier in the pandemic— like, "If you're wondering who to thank for hand sanitizer, here's a tweet thread that tells you who to thank."

And this probably wasn't so. Um, but the story was that in 1966 there was a nursing student in Bakersville, California named Lupe Hernandez who came up with the idea that if we took alcohol, which we knew could disinfect, and we take some sort of gel, and combine them, then that would be, like, the perfect thing to quickly cleanse your hands, you know, in busy hospital settings.

Justin: What's the gel doing? What's the gel's role?

Sydnee: It's the vehicle for it. It's just— it's better— I mean, it's better than a liquid you gotta dump on your hands, right? And it could also be easily dispensed to people if it was in a gel. You know, at this point we had gels. We had things like squirt bottles and things that, you know, you could see where that... if we could use that as a vehicle for something that cleaned your hands, wouldn't that be convenient?

Um, the story goes that Lupe contacted, like, a pat— like, called some sort of number, inventions hotline, to try to get this thing patented. Nobody really ever knows what ever came of that. And then I think, like, what we would assume is the industry stole it. The— the big—

Justin: Someone—

Sydnee: The big cats.

Justin: [amused] The big cats. Of the... sanitization game.

Sydnee: Stole this idea.

Justin: "Did you guys hear anybody this? There's some lady [wheezes] who didn't get a patent on something and we heard about it! From a friend of a friend."

Sydnee: We actually don't know the gender of this nursing student.

Justin: Okay.

Sydnee: Man or woman is still part of the question.

Justin: Should not have— should not have assumed.

Sydnee: Well, the original story said it was a woman, but then there were other evidence that said maybe it was a man, and then there's other evidence. And that's part of the problem with this story, is that, um— 'cause it was reported in The Guardian in 2012.

And I'm not sure— I was reading this— like, there's a historian named Joyce Betty who works for the Smithsonian who tried to chase down, like, where did The Guardian get this story. And where is— like, can we find this human? Can we go through, like, the records of the hospital where they supposedly worked and find any patients registered to this nurse? Can we call— like, and they were in contact with a historian in Bakersville who was like, "I've been trying to figure this out, too! I saw the same tweet thread!" Like, where did this come from?

Um, and all of this got revitalized interest in 2020 because of the pandemic. And so all of these people were trying to track down the origins of this. Is this true? Where is this person? Did they really get deprived of credit for their invention, you know? Is this really something that happened?

And we've never been able to find any proof that this person existed, and that this really is where we came up with hand sanitizer.

Justin: I'd love to be— where do I sign up to be the kind of reporter that just looks at the stories that other people did and they're like, "Ah ah ah, not so fast! I got you!"

Sydnee: [laughs] I—

Justin: I wanna be that one! Who's, like, right behind your shoulder. Like, "Ooh, well, interesting! Is that true or did you make it up?"

Sydnee: You gotta feel kind of bad for this reporter who, like, in 2012 wrote this story that sounds very compelling. And certainly they must've—

Justin: [simultaneously] "No one'll ever check up on this." [wheezes]

Sydnee: —gotten it somewhere. I don't know where it came from originally, but certainly they got it somewhere, and they, like—

Justin: Nobody's making this stuff from whole cloth but, like, sometimes in the journalism industry you hear a story that's really good and you're like, "Man, I— I've heard this from a couple sources now. Let's— let's go with it."

Sydnee: And I will tell you, as a researcher, it is hard. I have had— and, I mean, we've talked about it on the show— various times where I found a story, I found it other places, I felt like I corroborated it, I felt like I found enough, like, initial primary research that proved, like, this is real, and then only to have a listener say, "Actually... that's not true."

And then I've had to dig deeper and find that there was, like, a root, like, falsehood, where all of these branches of false information came from, and I didn't realize it because I found so many corroborating false branches. It's hard. It's hard to do. Um, and I mean, maybe there is some grain of truth in this. But as it stands, you'll find this story out there on the internet if you google "where did hand sanitizer come from? Who invented it?"

And as of yet, we don't know that that's actually— I don't have any evidence that it's true. I'm not saying— it sounds plausible. It sounds certainly possible. Can't prove it. Um, but I can tell you about all the people who did come up with what we know today as hand sanitizer.

Justin: Okay.

Sydnee: But first, I gotta take you to the billing department.

Justin: Let's go!

[ad break]

[music plays]

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[music and ad end]

Justin: Sydnee, you were about to introduce me to the heroes of sanitization.

Sydnee: So, a lot of patents have been filed since the early 1900's for things that were sort of like hand sanitizer. I don't really have evidence that they made anything. I guess you can just file a patent and then not make it, right?

Justin: Yeah, if you got free time. [laughs] Sure!

Sydnee: [laughs quietly] I don't know.

Justin: "I don't wanna do this, but I do want credit for it if anybody does do it!" [laughs]

Sydnee: There's a— in 1908, a Hans Kuzel files a patent for alcogels.

Justin: A better name.

Sydnee: Which sounds like what you would expect that should be the initial hand sanitizer. Um—

Justin: Or just a way— a very convenient way of getting drunk on the go. [laughs quietly]

Sydnee: [laughs quietly] Alcogel!

Justin: Who has time for these clumsy glass bottles? There's always shattering! Why not reach for a packet of alcogel? It's the drunk of the future! Whee!

Sydnee: In, uh— in 1936, William Moore sort of built on that and registered a patent for a disinfectant that could be used on skin and was based on this alcogel kind of idea. Like, referenced this old patent. Like, we know that alcogels exist 'cause there was a patent.

Justin: Everybody loves alcogel.

Sydnee: I don't know that the alcogels did exist. But, um, in 1941 there's another one for germicide filed. Which, again, similar ideas. Um, without, like— there is no, like, product history I have here. There is no substance that came from this that was sold widely, or given to hospitals or whatever, or however it would've been used.

Justin: It's like somebody had the idea, but not necessarily into mass... what's the word I'm looking for? Production.

Sydnee: Yes, exactly. Um, in the 1940's the first thing we see that's similar is when a couple named Goldie and Jerry Lippman have the idea for this hand cleanser, a waterless hand cleanser. Now, this is different, because— and they start mixing this stuff, by the way, in a washing machine in Goldie's parents' basement in Akron, Ohio.

Justin: Wow.

Sydnee: So they start making big batches of mineral oil, petroleum jelly, and 5% alcohol. So not enough...

Justin: No, not enough to get the job done.

Sydnee: No, not enough to be disinfecting, but enough to... like, if you talk about hands that look visibly dirty, this would work very well to clean them. Like, they would look visibly cleaner. Um, and this wasn't aimed at disinfecting as much as people who worked in, like, rubber plants.

People who had hands that were covered in grease and oil, um, that needed a good waterless cleanser to get that off. That is really what they were aiming to do. They weren't trying to kill germs. They were trying to get all that grease and dirt off. 'Cause a lot of people who worked in those kinds of lines of work would use toxic, like, caustic substances to try to get all this stuff off their hands. And the idea was, this is safe.

You can put this all over your hands, you can put it on your skin. It's not gonna harm your skin, and it will remove all that visible grease and dirt. Um, and they called it Gojo.

Justin: Gojo?

Sydnee: Yeah, Goldie and Jerry.

Justin: Ohh, okay.

Sydnee: Gojo. So they made this stuff, they called it Gojo. I believe it's still sold today? I believe it's still out there.

Justin: Really?

Sydnee: Yeah. And the Gojo company definitely continues, you'll see. But, um, they called it Gojo, and they sold it out of the trunk of their car. They would mix up these giant batches of it in the washing machine, and then put it in pickle jars, and sell it in pickle jars to anybody who worked in, like, an industry where their hands would get dirty like that.

Justin: Yeah, Gojo. It's still a thing.

Sydnee: I was kind of surprised you hadn't heard of it.

Justin: Why?

Sydnee: Well, you work with your hands now.

Justin: [wheeze-laughs]

Sydnee: You got into that.

Justin: Yeah, that's true. I just use— I have— I— I just have dirty hands. I don't— I just kind of roll with it.

Sydnee: You just don't care.

Justin: I don't leave the house a lot, so yeah. I have a special 3M paint cleaning soap that I use, but other than that I just kind of roll with it.

Sydnee: Yeah. Well, and you can see where this gets us on the right direction. Like, this is close. This isn't it. This isn't gonna do what our modern hand sanitizers do, 'cause there's not enough alcohol in it. But we're getting there. We have something that's waterless that cleans your hands quickly and effectively.

Um, there are some patents filed in the 50's and 60's for some— again, some concepts of hand sanitizers that would be very cool, although I don't know that they ever actually existed. Um, they're not substances as much as, like, the delivery method. 'Cause those are the two things you need, right? Like, what is gonna clean your hands, and what is the delivery method of this?

Um, there's one for a rapid hand sanitizer, which— and these are fun. So, there's, like, a box with holes in it. And you would just stick your hands in the holes.

Justin: That, I love. That's convenience.

Sydnee: And you can see where, like— these are filed in the 50's and 60's, so if you start thinking about, like, the futuristic kind of obsession...

Justin: You would just have one of these outside of a— a cafeteria, or— or, you know, whatever.

Sydnee: And on your way out you'd just stick your hands in. And the idea for this one is an electrically-operated fine spray device, and a hot air blower dryer, which would clean your hands in just a few seconds. And the compound would have lanolin, pure grain alcohol, perfume, and maybe some sort of disinfectant. So obviously they didn't know what was gonna be in it. But, like, you stick your hands in a box, they're sprayed with something and then dried very quickly, and you take 'em out and they're clean.

Justin: Perfect.

Sydnee: Which sounds very Jetsons.

Justin: It'd be great!

Sydnee: You can see where this was, like— this was a very Jetsons thing.

Justin: It'd be great. We could probably get there. If we would spend a little bit more focus on it.

Sydnee: There was another one, same idea for a hand sanitizer. Again, a box with an opening where you could stick your hands in. Now, this was a sanitizing fluid where you would just immerse your hand in this sanitizing fluid in a box and you would— like, there'd be a ding or something. [laughs quietly]

Justin: [laughs]

Sydnee: Some sort of time that said, like, "You're done!" And then you take your hands out and they're clean. Um, but this still doesn't give us, like, what's in there! What is the substance? We need the thing that cleans your hands. These are cool boxes. Which, by the way, so you can just patent, like, a box with holes in it?

Justin: I guess, yeah. You don't actually have to make anything. You can just patent it and wait for the money to start rolling in.

Sydnee: [laughs quietly] For a box with holes in it?

Justin: Yeah, why not? It's a box with holes in it. Anything you put in that box, you owe me five cents.

Sydnee: One time in fifth grade my friend and I drew an invention, which was a computer that you could type in whatever you wanted and then it would give it to you. And that's not an invention.

Justin: That's genius!

Sydnee: [through laughter] That's not an invention!

Justin: You— you should be a multibillionaire! It's amazing!

Sydnee: It feels like this, though. It feels like this.

Justin: It's amazing. Anything you want, or...?

Sydnee: Yeah. In our—

Justin: Whoa!

Sydnee: —in our example it was a pizza, is what we presented to the class. You'd type in pizza, and then it would spit out a pizza. Please remember, when I was in fifth grade, computers were very new. [laughs]

Justin: Yeah. But I will say this, that it's basically 3D printing.

Sydnee: It was. It was—

Justin: You basically invented 3D printing.

Sydnee: I invented 3D printing. I should've—

Justin: If you have 3D printed anything, email my wife a quarter, please.

Sydnee: [laughs]

Justin: You owe her.

Sydnee: I wish I had patented it!

Justin: Of course you should have!

Sydnee: I mean, it's 50—

Justin: A computer that can print anything?! Why didn't you patent that?!

Sydnee: It's a 50/50 split with my friend Stacy. She gets the other 50.

Justin: Alright.

Sydnee: Okay.

Justin: Okay, fine.

Sydnee: [laughs]

Justin: So send Stacy 12 and a half cents, then send Sydnee 12 and a half cents. Any time you 3D print something.

Sydnee: I don't know. We used my fifth grade teacher's class and materials, so maybe Ms. Waddell gets a cut, too. I don't know. [laughs]

Justin: [crosstalk] So it's like an incubator. I love that. I love that grift. Yeah, it's a classroom and kind of an incubator. Like, that's a loft space, which means I make the kids sleep under their desks while they invent things for me. And I get 5% of the bad ones and 10% of the good ones.

Sydnee: Okay. So, this still— we're not at a compound yet. Now, in 1965 in Hamburg, Germany, there is Peter Kalmar, who works in a hospital and creates something called Sterilium, which is a much—

Justin: Bad name! That's a bad name.

Sydnee: It's a rough name. Alcohol based, no water needed. You rub it into your hands. Here we go. Now we're in business. Now we've created hand sanitizer. It's called Sterilium. Um, the pictures I saw of it look like it was just in, like, a big bottle. Um, so, like, the thing that meanwhile that Gojo had done, the inventors of Gojo, is they had patented that, like— the dispense mechanism. The idea of, like, a single serving dispenser for their product. And that was huge. Because you can see the convenience factor—

Justin: And the first thing they said is "We have to make this smaller. Why did we make it huge? This is so inconvenient."

Sydnee: And so— but, like, again, no major manufacturers are doing anything with this. Like, nobody is doing— this is not widespread. A lot of these things that they are making are just being used maybe in a hospital, or in a lab somewhere, or something like that. But you're not— nobody is selling this stuff to the public. Because I think at this point you would also wonder, like, does anybody wanna...

Justin: We've made it this far, yeah.

Sydnee: ... buy this? You know, is there a market for it? Do people worry enough about cleaning their hands to want to buy something like this?

Justin: No, but maybe we should make them worry more.

Sydnee: Well, that— that's always the key, right? You gotta make 'em afraid. Um, so— and in 1988, Gojo actually did go ahead and make a 70% ethyl alcohol based hand cleaning gel. So they did make it, like, that early. There was no— they didn't bring it to the market. There were probably people using it, but it was not being marketed at all. That existed, though, as far back as '88. You don't see it enter the market until '97, so that's how— that's really how recent, which is weird if you think about it.

Justin: It's very recent. I remember— I have pretty clear memories of, like, starting to see hand sanitizer. Like, it seemed like a... an overreach at first, I

think. That, like, you'd start to see people, like, "Wow, you must be a real—" the connotation was always, "You're, like, a germophobe."

Sydnee: Yes.

Justin: Like, certainly when it came out it's like, "Oh, you're somebody who's, like, super, super worried about germs all the time."

Sydnee: Absolutely.

Justin: It was almost like the— the pocket protector of its— of its day. [laughs quietly]

Sydnee: It was. It was definitely not something that you would commonly carry with you, or that you would've seen in all the ways that you do today with, like— I always think of places like Disney where they have all the fun character little holders for bottles of hand sanitizer. You certainly wouldn't see that kind of thing back then.

So, in '97, Gojo launched their version of hand sanitizer. You may know it. It's called Purell. And it was a viscous, isopropyl alcohol based hand sanitizer. Um, it's got antimicrobials and chemicals that will make it gentle. It's fine for your skin. 'Cause that was always part of it too. You need a cleanser that's safe for your skin.

Um, so this was released in '97. And you know what came out that same year was Germ-X.

Justin: Wow.

Sydnee: So, like, the two major players in the hand sanitizer industry—

Justin: The big ones, the heavy hitters.

Sydnee: Yeah, Purell and Germ-X, come out. Which I think even to this day are, like, number one and two. Um, come out in that same year. But they're still not being sold that much yet. Like, they're released in '97. Like you said, there were definitely people who started to use them. And you could see a shift pretty quickly, because a couple things happened.

First of all, in 2002 the CDC— that's when they first released their official statement that they had enough research to say alcohol based hand sanitizers are a reasonable alternative to hand washing. That was kind of, like, what they— you know, in a situation where you don't have access to soap and water readily, this'll work. This is fine. You can do this. It's safe, it's effective, the CDC endorses it. And this was huge, because it allowed it to be promoted in certain settings where something cost cutting and time saving like this would be especially useful.

So, like, you saw the US military immediately adopt the use of hand sanitizer. Hospitals very quickly adopted the use of hand sanitizer. And I feel like I can remember seeing the, like, shift in hospitals from soap dispensers next to sinks to those ubiquitous hand sanitizer dispensers everywhere, right?

Justin: I hate those things. I can't tell you how many times I've— they're motion sensing at the hospital. I can't tell you how many times I've been in a patient room and I just, like, lean back on a wall, and it's the hand sanitizer wall, and I just totally goosh my back.

Sydnee: You do. You do. And a lot of 'em are like a foam, so then you're— you're just gooshed with foam.

Justin: [simultaneously] Just gooshed my back with foam!

Sydnee: Um, and they found— they did studies at the time that found things like an ICU nurse could save an hour out of their shift by using hand sanitizer instead of washing their hands in between patients.

Justin: That's wild.

Sydnee: And so you can see where in a setting where time is money, you would immediately want to switch to this. So that was a big moment. In 2002, the CDC said "Yes, we can use that." And so you started to see it in, like, these institutional settings. And then the other big thing that happened in 2009— well, first of all, the World Health Organization echoed the CDC in 2009 and said 'Yeah, we agree about hand sanitizer."

There's another thing that happened in 2009.

Justin: What?

Sydnee: Well, it— it may be hard to remember, but there were other pandemics. [laughs quietly]

Justin: Is that swine flu?

Sydnee: H1N1.

Justin: Oh, okay.

Sydnee: Yeah, swine flu.

Justin: I couldn't remember. It was either swine flu or bird flu. Those were the ones.

Sydnee: And you saw with H1N1, you saw sales of hand sanitizer just shoot through the roof. Because all the sudden, people became aware that they should be washing their hands more, but they can't if they're on the go. There are all kinds of settings where washing your hands aren't convenient, and so hand sanitizer jumped in to fill that void.

Um, and that is really where we see— it's only been since 2009 that it has been so common to see hand sanitizer everywhere you go, plus people carrying it as, like, a— like a normal, common thing for people to do and not, as you said, as it would've been seen previously, as kind of like a germophobe type, you know, thing.

Um, since then, Purell has got into trouble periodically. Um, if you can picture some of their packaging, you probably— like, they say they're 99.9% effective at killing disease-causing germs. They've made claims about things like Ebola before. And you gotta be careful when you make claims like that, if you haven't actually done a study to see if it kills Ebola.

Justin: Oh yeah? I would assume that's a big— that's an issue.

Sydnee: So they've periodically gotten in trouble with the FDA for making claims that they can't completely... I mean, it's hard because we have, like, decades and decades and decades of research on alcohol and germs, but that doesn't always mean that, as we've talked about on the show before, just because alcohol in a petri dish kills germs doesn't mean that the way a person might interact with a hand sanitizer dispenser to clean their hands with hand sanitizer would decrease the germ burden enough to prevent infection with that germ. You have to do that study to see. 'Cause you also have, like, real life use.

One of the big things with hand sanitizer is you've got to let it dry. How many people, before COVID, would just sort of rub it on their hands and move on touching things before letting it dry?

Justin: How many people put their hands underneath the dispenser, and you can't really hear it or see it, but you *think* some came out? And then walk away.

Sydnee: You just sort of rub your hands together.

Justin: And you're just rubbing your dirty hands together for no reason? Yeah.

Sydnee: Uh, but the pandemic really solidified, like, the presence of these things in our life. I mean, like, I don't think it will ever go away now. I think since 2009 they were more popular. I think because of COVID, you see them everywhere, and certainly an explosion of, like, do-it-yourself.

There were a lot of, um, early on in the pandemic a lot of, like, TikToks and YouTubes about how to make your own hand sanitizer. A lot of small business based products. Um, a lot of people argue that this is a market that's really ripe for disruption, but I don't know... I don't— I don't know— I don't know, but I don't think that way so of course I wouldn't. Like, what else do you need?

Justin: [laughs]

Sydnee: Like, what— how— you know? What do you—

Justin: If you had asked— if Ford had asked Sydnee what she wanted, she would've said a faster horse. Just... you know.

Sydnee: Yeah? I mean... yeah. But then a lot of problems came with cars, to be fair.

Justin: [laughs quietly] There we go.

Sydnee: You mentioned Tito's. Tito's actually had to release a statement early in the pandemic to say you cannot use our vodka as hand sanitizer because it's 40%, not 70%.

Justin: But Midnight— Midnight Grandpa, the bottom shelf whiskey, was like "Yeah, absolutely. We got you, we got you covered."

Sydnee: "No, we're fine. Yeah, we got you covered." Um, so— and while all this is great, like, obviously hand sanitizer has found its place as an alternative to hand washing when soap and water aren't accessible to disinfect your hands to an extent. Right? Like, we know that. And, I mean, I carry hand sanitizer wherever I go. I use it in the hospitals. Most of the time when I am seeing patients, I am gonna use the hand sanitizer dispenser on the wall, and I'm not gonna go find a sink and stop and wash my hands.

Justin: 'Cause it's just as— 'cause it's just as good as washing your hands!

Sydnee: Well, it's quicker, it's more efficient, it's easier, yes.

Justin: Better. Better.

Sydnee: It is what I'm gonna do. It's what I'm gonna do. However, washing your hands is still better, 'cause it's a mechanical action. So when you think about, like... I guess if you've already given your hands a good scrub, to continue on throughout your day with hand sanitizer is somewhat the same. But if you have, like, dirt and debris or oils or things on your hands, especially if you've been outside— like, think about, like, when I've been out gardening. If I only use hand sanitizer on my hands when I'm done gardening, my hands will still look dirty, right?

Justin: Right.

Sydnee: And while that visible dirt isn't the same as looking at germs, obviously, all of those large particles are great places for germs to hide. And I can't guarantee that I've gotten that alcohol substance in and around and all over all of those little particles of dirt and debris and oil and whatnot on my hands. Which is why at the end of the day, like, the mechanical action of soap and water, scrubbing your hands, is ideal. Hand sanitizer is okay if you can't do that, but, you know. Especially if you can see visible debris on your hands.

Justin: Wash 'em.

Sydnee: Yeah.

Justin: Uh, Sydnee, thank you so much. And thank you, hand sanitizer. We took you for granted, and then we really realized that... you were there when we needed you.

Sydnee: Now, it is not effective— I have said this before on the hand washing. Hand sanitizer is not effective for C. diff, Clostridium difficile. Which is an infection that causes diarrhea, and you have to use soap and water if you've been in contact with it.

Justin: Seems like a pretty big... gap. [wheezes loudly] Seems like they should fix that.

Sydnee: It's not— I mean, hand sanitizer has its place, and I think especially— we're all out in the world. We're all interacting a lot. We have this very contagious virus. Obviously it has its place. Um... but it's always great to wash your hands. When you're done going to the bathroom, wash your hands. When you're gonna eat something, wash your hands. Wash your hands!

Justin: Wash your hands! Thanks so much for listening to our program. 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! We really appreciate it, and we hope that you, uh, are having a nice life. And we hope that you'll join us again next week... for *Sawbones*. Until then, my name is Justin McElroy.

Sydnee: I'm Sydnee McElroy.

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

[chord]

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