

## **Sawbones Episode 41: Self-Experimentation**

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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 song Medicines by The Taxpayers plays]

### **Justin:**

Hello everybody, and welcome to *Sawbones*, a marital tour of misguided medicine. I am your cohost, Justin McElroy.

### **Sydnee:**

And I'm Sydnee McElroy.

### **Justin:**

Sydnee, I've done it!

### **Sydnee:**

Oh no. You've done what?

### **Justin:**

I've done it. After, uh, uh, I've finally found the exact right amount of Downy Fresh Unstoppables to add to my laundry to get the perfect, uh, blend of scent longevity versus freshness impact.

### **Sydnee:**

Now, uh, one quick question.

### **Justin:**

Yes.

### **Sydnee:**

What, what is this? The Downy-

**Justin:**

Downy Fresh Unstoppables. Yes, Sydnee.

**Sydnee:**

What i-, what are, a-, is that, are those, I don't even know which, to use a plural or a singular noun. What, what is this product?

**Justin:**

Uh, for those of us who, uh, do laundry, Downy Fresh Unstoppables is a, a, a, uh, it's sorta like s-, crystals that you, uh, ha-, uh, can in-, can in- include with your laundry during the wash cycle to up the freshness-

**Sydnee:**

Just to clarify, this is not an ad. Justin's really just telling you about this.

**Justin:**

This is how the Downy Fresh Unstoppables work. Now, the problem with Downy Fresh Unstoppables is that in the directions, they say you can add up to, they're like, they're just little crystals. Like, they're little crystals, right?

**Sydnee:**

Okay. And you, do you put that in the washer or the dryer?

**Justin:**

In the washer. So-

**Sydnee:**

Okay. The washer's the wet one?

**Justin:**

The wet one-

**Sydnee:**

With the-

**Justin:**

Well, okay. I think-

**Sydnee:**

... you put the clothes in first?

**Justin:**

I don't think you have to do laundry to know that washing is wet, but it, this is an okay bit I guess.

**Sydnee:**

[laughs]

**Justin:**

Okay. The-

**Sydnee:**

I really don't do laundry-

**Justin:**

Oh yeah, not a bit.

**Sydnee:**

... ever.

**Justin:**

Uh-

**Sydnee:**

Justin does all the laundry.

**Justin:**

Thank you for acknowledging that. Um-

**Sydnee:**

Yes.

**Justin:**

So you add a s-, on the directions of the Downy Fresh Unstoppables, it says you can add up to the fill line on the cap, you can add that much, or add as much as you want. [laughs] Okay, Downy Fresh Unstoppables.

**Sydnee:**

S-how have you been experimenting with this?

**Justin:**

I, everythi-, i-, I've, I, I mai-, I'm mainly experimenting on myself, with my own garments, 'cause we, uh, you know, I don't wanna put you at risk of too much freshness, an overabundance of freshness, so I, uh, uh, uh, with, with my shirts, my shorts, and my unmentionables, uh, uh, through rigorous tests varying in, uh, longevity of wear, um, uh, amount of crystals, um, and a, and a few other factors, I have finally calculated, by experimenting on my own clothes, exactly the right amount of Downy Fresh Unstoppables to include.

**Sydnee:**

How did you figure out if you were fresh or not? Like, did you ask people, like, "How fresh do you think I smell?"

**Justin:**

The problem is, you can't-

**Sydnee:**

'Cause you haven't been asking me.

**Justin:**

You can't ask them in the moment, is the thing, because everybody, in the moment, thinks things smell fresh. You gotta, have to ask them the next day, "Did you, do you remember yesterday, me, anybody being particularly fresh?"

**Sydnee:**

Now, here's my question though-

**Justin:**

Okay.

**Sydnee:**

... you don't leave the house much.

**Justin:**

Not much.

**Sydnee:**

Most days you only see me and our cats. So who, who were you-

**Justin:**

The answer, the answer to the question you're building towards is the mailman. But yes. Through experimentation, I have calculated-

**Sydnee:**

We're gonna have to tip him well this Christmas. [laughs]

**Justin:**

[laughs] I have calculated the exact amount of Downy Fresh Unstoppables to include with my laundry.

**Sydnee:**

Well, I'm, I'm proud of you.

**Justin:**

Thank you.

**Sydnee:**

Congratulations. If Downy wants to offer us any money for that... [laughs]

**Justin:**

Yeah, that, that extended plug.

**Sydnee:**

No, we'd, we'd welcome it. Um, did you know that you were following in, like, a proud, scientific tradition with this self experimentation you've been-

**Justin:**

I did not.

**Sydnee:**

Well, th- that's the case. Uh, would you like to hear about some other, um, actual doctors? Not just honorary doctors, like you.

**Justin:**

Not laun- laundry doctors-

**Sydnee:**

Laundry doctors.

**Justin:**

... like myself?

**Sydnee:**

Who may be engaged in some of, uh, a little bit of self-research of their own?

**Justin:**

I can't imagine how they're accomplishments will, uh, sorta compare to what I've done here, um, so I, uh, yeah, I guess I would like to hear about them.

**Sydnee:**

Sure. Well, we're gonna start with Walter Reed, so that may be, I mean-

**Justin:**

He sounds okay.

**Sydnee:**

Yeah, you may have heard of him. And I, I'd just like to mention that the topic for this episode was actually inspired by one of listeners, Ken, suggested it.

**Justin:**

He is a doctor that does experiments on himself.

**Sydnee:**

I don't, I don't think-

**Justin:**

Cheese it, Ken!

**Sydnee:**

I don't think Ken is. He, [laughs] maybe.

**Justin:**

Maybe.

**Sydnee:**

Maybe he is. I don't know. But he suggested Walter Reed, and this, uh, this gave birth to the rest of this topic. So thank you, Ken. Um, now a lotta people have heard of Walter Reed.

**Justin:**

Yeah, he's got that hospital.

**Sydnee:**

Exactly, 'cause of the hospital. So, uh, Walter Reed was a person before he was a hospital.

**Justin:**

That's good! We don't wanna reverse that. It could be very underwhelming.

**Sydnee:**

No, he was a, he was-

**Justin:**

"I'm gonna name my kid after this hospital."

**Sydnee:**

The nation's first transformer. [laughs]

**Justin:**

"Ra, ra, ra, ra, ra, I'm a doctor."

**Sydnee:**

Now he's a hospital. Um-

**Justin:**

"Oh no! He changed with everybody inside! Not again! Oh God, there's blood everywhere! Our veterans!"

**Sydnee:**

That would not make him a very good doctor.

**Justin:**

Like, the worst doctor.

**Sydnee:**

So he got his MD from the University of Virginia when he was 18 years old.

**Justin:**

Wow! Nice job, Walter.

**Sydnee:**

Yeah. He is still the youngest person ever to receive an MD from that school.

**Justin:**

Doogie. It coulda been Doogie Howser Hospital.

**Sydnee:**

When you look at it that way though, wasn't Doogie, like, 15 or 14?

**Justin:**

Yeah, Doogie's, like, way better than Walter Reed.

**Sydnee:**

Yeah. So still no comparison, really, there.

**Justin:**

Yeah. Doogie's legacy is safe.

**Sydnee:**

Where is that hospital?

**Justin:**

Doogie Howser Hospital?

**Sydnee:**

Doogie Howser Hospital.

**Justin:**

I'd go.

**Sydnee:**

[laughs]

**Justin:**

I'd drive a distance.

**Sydnee:**

Um, so because he was so young when he graduated from medical school, he actually had a lotta trouble kinda getting a, a good job. A lot of people wouldn't take him seriously. So, he knew he was a bright guy; he knew that he was destined for greatness, uh, but nobody wanted to hire him to do anything great because he was 18. And everybody was like, "Hey, what does that young kid know about medicine? Get outta here."



**Justin:**

Nobody wants a wunderkind running around, making them feel old.

**Sydnee:**

No, with his yo-yo and his bubble gum.

**Justin:**

[laughs]

**Sydnee:**

[laughs]

**Justin:**

His Arch-, his Archie comics.

**Sydnee:**

Forget that guy. So he decided, "I, I need some opportunity. I'm young, I need some adventure." He joined the army and he went, went west, young man. And this was a good move for him, because he traveled out west, he studied a lot of bacteriology and epidemiology, as a result of, uh, some of the typhoid outbreaks that he worked with. So he became-

**Justin:**

Real quick: what's epidemiology?

**Sydnee:**

Uh, like, the study of disease spre-, like epidemics, like the study of disease spread. So kind of-

**Justin:**

Not related to epidermis.

**Sydnee:**

No, no. The study of how, like, uh, they always have epidemiologists at health departments or at the CDC to study where an outbreak started, and how it spread, and how we can stop it. That kinda thing.

**Justin:**

Okay.

**Sydnee:**

Uh, so he did a lotta research with typhoid, and he made kind of a name for himself doing, doing this kinda stuff, uh, which is why, uh, the thing we know him best for, uh, is the yellow fever commission, which he was asked to lead, uh, by the, uh, US government.

**Justin:**

Very prestigious.

**Sydnee:**

Yes. It was very prestigious. 'Cause this was a big deal; there were a lot of US soldiers down in Cuba, and they were dying in huge numbers from yellow fever, uh, which is a terrible hemorrhagic, uh, virus, hemorrhagic fever that will, uh, that kills large numbers of people and makes you bleed, and throw up black stuff, and it's really terrible.

**Justin:**

That sounds terrible-

**Sydnee:**

So it was-

**Justin:**

... actually.

**Sydnee:**

Yeah, it was pretty vicious. We didn't know how people were getting it; we just knew that all of them were. We didn't know how to cure it or fix it or fight it, uh, so basically, the government said, "Hey, Walter Reed, you know about this stuff. Why don't you go down, head up a commission, get some doctor buddies, and try to figure out what the heck's going on with this yellow fever thing.

**Justin:**

Gross. You gotta be really devoted to go down where yellow fever's poppin'.

**Sydnee:**

Well, and he didn't exactly go down right away. [laughs]

**Justin:**

Kinda stalled?

**Sydnee:**

He, he kinda put together a team-

**Justin:**

"Oof, *Madmen* finale coming up! Can't really get down there right now, but I will definitely, once that mid season, uh, finale pops off, I think I got a few months to get down there, just, like, really get deep. But Donnie, Donnie D., uh, Roger, all the gang, gotta see how that shakes out for all them. So I cannot get down there right now. Do apologize."

**Sydnee:**

You're really jonesing to watch that episode of *Madmen* we have on DVR, aren't you?

**Justin:**

Yeah [laughs], that was, it was top of mind, I'll admit.

**Sydnee:**

Sorry. Um, so he, and the reason I mentioned that he wasn't down there initially is not to make him sound like a wimpy guy, or, you know, uh, it was purely because the first phase of the research and trials that they did, he really didn't have a big hand in, which, I think he would appreciate us mentioning when I tell you what they did.

**Justin:**

[laughs]

**Sydnee:**

Uh, so he thought, this was his basis: he thought that the yellow fever virus was probably mosquito born.

**Justin:**

Is that right?

**Sydnee:**

Yes. Meaning that you got it from the bite of a mosquito. This was absolutely right. This was actually postulated by a Dr. Carlos Finley, who had written about it, and Walter Reed had, had, and gave him credit for, you know, kinda taking this idea and said, "I think this guy's got the right idea." He set up a, a group of researchers, um, a couple famous doctors from the time, there was a des-, Dr. Jesse Lazear, James Carroll, Aristides Agramonte, which I only mention because that is his name.

**Justin:**

That is such a good name.

**Sydnee:**

Right? Yeah. He doesn't feature largely in the rest of this story, but that's his name!

**Justin:**

I'm glad he could dip in for that though, I d-, I really appreciate it.

**Sydnee:**

[laughs] I, I added him to the list just for that reason. Um, so they, they all took off. And he kinda set them up and said, "Look, I really that the mosquitoes are spreading it. Why don't you do some research, figure it out, come up with some trials. You guys are smart doctors, you can figure this stuff out. I'll be down there soon. Just get started."

**Justin:**

Mm-hmm [affirmative].

**Sydnee:**

Okay? So he got everything in place-

**Justin:**

[laughs] "If any of you gets yellow fever, give me just a real quick call."

**Sydnee:**

Jus-

**Justin:**

"I'll see if I can't push that flight back a little bit."

**Sydnee:**

"Send me a telegram." Uh, so they set up the initial phase of experiments, and the thing is that m- most of them weren't onboard with the whole mosquito theory; they really didn't buy it. They thought, "You know what? Ah, this probably has something to do with water, or maybe it's spread through the air, we don't really know, but this mosquito thing seems a little wacky, so let's just get it out of the way. Let's just do that part of the trial really fast, prove it's not mosquitoes, and then we can move on with the real research."

**Justin:**

Okay.

**Sydnee:**

Okay? "So the easiest thing to do is try it out on ourselves."

**Justin:**

Sorry?

**Sydnee:**

So they wanted to see if they could infect themselves with yellow fever using mosquitoes.

**Justin:**

That seems reckless.

**Sydnee:**

L-, a little. [laughs]

**Justin:**

A tad reckless.

**Sydnee:**

Plus, you have to get bitten by a mosquito, which is, like, not fun.

**Justin:**

I bet, I bet it is annoyingly difficult to get bitten by a mosquito when you want to, you know? They're, they're there when you don't, but I bet if you're like, "Come on, I'm delicious," I bet, I bet they are really annoying about it.

**Sydnee:**

There were, there were later studies done on malaria that kind of are like you're describing, where they would just, like, have guys sit outside and wait to get bitten by a mosquito.

**Justin:**

Just rubbed in butter and paprika.

**Sydnee:**

"Just, just sit here, and let's count how often you get bitten by a mosqui-, don't move, don't slap them."

**Justin:**

"Just let them drink."

**Sydnee:**

[laughs] Now, that's not h-

**Justin:**

That'd be the hard part.

**Sydnee:**

[laughs]

**Justin:**

"Yeah, go on little buddy. Get in there."

**Sydnee:**

"Just take your fill." Ugh. So that's not how they did this, they rigged this one.

**Justin:**

"Hey, Darryl! You gotta get out here! There's this jerk, he's just in a chair! You can just go drink, he won't do anything!"

**Sydnee:**

"He just sits there!"

**Justin:**

"He just sits there, I swear to God!"

**Sydnee:**

"There's another guy with a clipboard who just checks a box every time you do it"

**Justin:**

"I swear, I'll, I'll never figure these guys out! Oh well. Come on, I'm stuffed."

**Sydnee:**

So they, they wanted to make sure they got i-, th-, if they were gonna be able to get infected by a mosquito, they wanted to make sure that they did it right. So what they did, is they would take a mosquito in, like, a little test

tube or glass vial and invert it o- on the arm of a sick person, so that basically, the mosquito was trapped between the, the skin of the sick person and the, the glass vial.

**Justin:**

Okay.

**Sydnee:**

Y- you get what I'm saying?

**Justin:**

Yeah.

**Sydnee:**

Can you picture that?

**Justin:**

Yeah.

**Sydnee:**

And then they would let the mosquito, you know, take a blood meal from the, from the person. So at that point, if it can be transmitted through mosquito, the mosquito should have yellow fever, right? Or should be carrying it, not have it. Not, like, sick from yellow fever. The mosquito isn't puking. But it [laughs], but it's got yellow fever. So then you take that same vial and you invert it on the arm of a healthy person and let it drink their blood.

**Justin:**

Okay, that makes sense.

**Sydnee:**

Because when a mosquito takes blood, it also injects some of its saliva into the person, and so you're gonna get the yellow fever from the mosquito.

**Justin:**

Okay.

**Sydnee:**

So they just went ahead and, and, you know, got the mosquitoes to bite sick people and then bite them. And initially, nobody really got sick.

**Justin:**

They were excited. They were like, "Finally, we can move onto the water theory."

**Sydnee:**

Exactly. At first, they were like, "Hey, this is, this, this is looking pretty good." You know? Like, "We, we're not getting sick, so we think this is probably," you know, "This theory's no good. We're gonna try a few more people." They were good scientists. They, they knew what they were doing. "We're gonna try a few more people before we say no." And then one of them got sick. James Carroll, one of the lead researchers, got really sick. So did one of the young privates that they worked with, uh, they, they had a lot of, uh, volunteers from the Army, and they both got pretty sick.

**Justin:**

That seems like, seems like kind of a reckless use of our fighting men.

**Sydnee:**

[laughs] "Hey, c- come let me infect you with, uh, yellow fever."

**Justin:**

That's like one-

**Sydnee:**

Or try to.

**Justin:**

That's like the duty they give you when you can't even peel potatoes right. "Ah, okay. We do have one job." "Ugh, fine." "Go work with Walter Reed."

**Sydnee:**

This, again, this, I, I, and I, I bring up malaria again, because later we would, we, and we probably did, not necessarily do experiments with our fighting men and women, mainly men during the time period, with malaria, but we definitely, um, experimented with all kinds of treatments for it on them.

**Justin:**

Can I ask, uh, this may be a stupid question, uh, but is yellow fever treatable?

**Sydnee:**



Yes, it's treatable. It's not curable, but it's treatable. But it's supportive treatment.

**Justin:**

Oh, so these guys were just giving themselves an incurable disease?

**Sydnee:**

Yes.

**Justin:**

Nice.

**Sydnee:**

Yes. And, and that was the thing at the time, is that, uh, one of the motivations, why would people have done this, is the perception was that if you lived there or you were stationed there, you were gonna get yellow fever. So if you were gonna get it, at least you're under the care of the United States military when you get it?

**Justin:**

Mm-hmm [affirmative].

**Sydnee:**

You're not just out in the bush somewhere.

**Justin:**

You could probably work a medal out of it.

**Sydnee:**

So, well-

**Justin:**

I would think.

**Sydnee:**

And all of these men, I should, should note, are remembered mainly for their bravery in doing this experiment.

**Justin:**

I think they were just being a jerk.

**Sydnee:**

[laughs]

**Justin:**

They just were trying to rub it in Walter Reed's face. Like, this is not the, these are not the acts of sane men. These are men that are trying to rub in the face of their nerdy friend, Walter, "Yeah, Walter," th- they'll stuff him in a gym locker and then they make him watch as they put mosquitoes on their arm. "Look at him, he's biting me! Oh, Walter, it's terrible! Save me, Walter!"

**Sydnee:**

[laughs] "Look at him, his white coat doesn't fit, the sleeves are too long, and he's wearing those sneakers all the time."

**Justin:**

"What a jerk. We tied his shoelaces together. What an idiot! Oh G-, yeah, I don't feel so good. [laughs] How do you guys feel?"

**Sydnee:**

No, they didn't feel so good. So wo- once Carroll got sick, uh, w- one of, Dr. Lazear was actually one of the lead researchers, and he, wh- who knows what he was thinking at this point. So he sees, he sees his friend, James Carroll, get sick, almost died, didn't die, but got really sick, and then this young private also got sick. He had already attempted to infect himself once, right? He'd already put himself through this trial. Who knows why, I don't know if he felt guilty because his friend got sick, because he was crazy, stupid-

**Justin:**

'Cause Carroll was getting all the attention.

**Sydnee:**

[laughs] Maybe.

**Justin:**

That's what it was!

**Sydnee:**

Maybe!

**Justin:**

Everyone's bringing him chicken soup.

**Sydnee:**

All, all the ladies were visiting him-

**Justin:**

Yeah.

**Sydnee:**

... and were like, "Oh Jimmy, I hope you feel better soon!"

**Justin:**

[inaudible 00:16:59]

**Sydnee:**

So he decided to try it again.

**Justin:**

[laughs]

**Sydnee:**

And depending on how you look at it, he succeeded. He got, he got yellow fever.

**Justin:**

Okay.

**Sydnee:**

He got super sick, and unfortunately, he died.

**Justin:**

Eh...

**Sydnee:**

Uh, so, which, from what you read, is listed as a successful trial. [laughs]

**Justin:**

Oh. I mean, that is a, I mean, that is a, oh man.

**Sydnee:**

No, it-

**Justin:**

That's, that's such a bummer.

**Sydnee:**

It is a bummer. And it should be noted-

**Justin:**

I was just making jokes! Why did you let me, you wrote this! H- how could you let me make l- l-, he was, remember, he tied his shoelaces together and all that stuff! I made him sound like a jerk! How could you do this to me?

**Sydnee:**

How did you not see this coming?

**Justin:**

I d-, I-

**Sydnee:**

They were giving themselves yellow fever!

**Justin:**

I barely think-

**Sydnee:**

It's a hemorrhagic fever! Somebody was gonna die!

**Justin:**

I barely think, like, two moves ahead here, Sydnee. I can't calculate all the possible endings!

**Sydnee:**

So at this point, Walter came back down from the US and was like, "What are you people doing? I give you one task: find out if there's yellow fever in mosquitoes!"

**Justin:**

"You all gave yourselves yellow fever!"

**Sydnee:**

"And now my buddy, Jesse's dead, James is still in bed, this is terrible!"

**Justin:**

"Do I have to do all this myself? Ugh."

**Sydnee:**

So he took over at that point, um, with the second and third phases of the trials, which mainly involved getting volunteers to do it instead. Um, and how could you persuade people to volunteer? Well, you could always, like I mentioned, they were using people in the military, and so you could call on a soldier's sense of duty, and courage, and honor, and responsibility to his country, and again, the fact that you're probably going to get this anyway. Uh, so that was one angle. The other, I think a little more straightforward and applies to today, you just pay them.

**Justin:**

Okay.

**Sydnee:**

And those were largely not, uh, soldiers who were paid, they were just locals.

**Justin:**

Okay.

**Sydnee:**

Members of the community. And so they would offer you a flat rate, uh, depending on which source you look at, somewhere between 100 and 300 in gold, uh, to, to submit yourself to the experiment, and then you got extra if you actually got yellow fever. [laughs]

**Justin:**

Oh, nice.

**Sydnee:**

So somewhere between two and 500. That doesn't sound like a lot to infect yourself with a potentially deadly virus, except that's, like, between \$8,000 and \$20,000 in today's money.

**Justin:**

And it's in gold.

**Sydnee:**

Yes. That's, like, a lotta money.

**Justin:**

Which is way cooler.

**Sydnee:**

It's, like, 20,000 bucks if you get yellow fever, plus, again, the, the thought at the time was that if you were new to the area, you were gonna get yellow fever sooner or later, you didn't have access to a lotta medical care unless you were part of this experiment, and then you had all of the army doctors who were, you know, taking care of you, measuring every fluid that went in and out of your body, doing research on you, but also trying to make you better.

**Justin:**

SO how d-, how'd it all shake out?

**Sydnee:**

A- all said, there were, uh, 29 people who got sick from this experiment, and five of them, unfortunately, died, including the only woman who volunteered.

**Justin:**

So w- were, um, I mean, e-, did they, I mean, did they f-, solve it? I mean, did they get what they needed out of it?

**Sydnee:**

Exactly. They proved that it was mosquito born. Uh, and, uh, you know, Walter Reed went on to have a hospital named after him.

**Justin:**

Mm-hmm [affirmative].

**Sydnee:**

So clearly, he's remembered well. And I should say, again, do I think that there was courage and bravery in their actions? Sure, I think that's part of it. I think that was very honorable. I think there, there was also a little bit of arrogance. And then I think they paid a lotta people, and you can pay a l-, p-, you can pay people to do a lotta stuff.

**Justin:**

Yeah.

**Sydnee:**

So there's, there's the truth behind the yellow fever commission.

**Justin:**

So who's next?

**Sydnee:**

So along this theme, I wanted to share a couple other, uh, pioneers in the field of self experimentation. Max Joseph Von Pettenkofer, another great name, I don't know if it's-

**Justin:**

I like that.

**Sydnee:**

... all the way up there with Agramonte.

**Justin:**

That name smells like lederhosen to me.

**Sydnee:**

So [laughs] he was Bavarian born.

**Justin:**

Mm-hmm [affirmative]. Yep, see? Right there.

**Sydnee:**

He was, uh, an MD, uh, th-, eight, he was born in 1818, he was an MD and a chemist, and his area of interest was hygiene. So he actually taught hygiene, and he, uh, studied a great deal, uh, what was the effect of the quality of water, and food, and air, and, and how clean people's clothes were, and their houses, on their health, which is an important, and important area.

**Justin:**

Especially at that time.

**Sydnee:**

Yes, and very relevant to people's health, then and now. So he lived in Munich, and this was, uh, important because there was an, a cholera outbreak there in the 1880s and 1890s, and he was studying that. Now, the commonly held theory, because of coke of postulate fame, Robert Coke, Coke's postulate-

**Justin:**

Coke's postulate? Okay.

**Sydnee:**

Yeah, okay. We're talking about germ theory of disease kinda stuff.

**Justin:**

I've already got very excited about Coke.

**Sydnee:**

Yeah. I like to say of postulate fame, which, again, that's one of those things where there are, like, biology majors snickering, and you're just staring. [crosstalk 00:21:57] Y- you're giving me that one.

**Justin:**

"Nice one, Syd. [laughs]"

**Sydnee:**

[laughs] So he had recently discovered the bacteria that caused cholera, so they knew it was from bacteria.

**Justin:**

Mm-hmm [affirmative].

**Sydnee:**

We're not guessing where it came from at this point, e- e- except for Max.

**Justin:**

[laughs]

**Sydnee:**

He didn't buy it. [laughs]

**Justin:**

No?

**Sydnee:**

He, he thought, "Okay, that's fine. So you found the bacteria, it spreads cholera," but it's more than that, because he saw cholera so closely linked with people who kinda just were dirty, that was his perception, dirty people got cholera. He thought there was more to it. Well, but you, you, maybe you



can get the bacteria, but you can only really get sick and get the disease if you're not clean, if you don't wash, if you live in a dirty house, if you don't take care of yourself, basically.

**Justin:**

Which is interesting and kinda backwards from the way we understand things today. I mean, th- that is, those are contributing factors, but once you've found the bacteria, that's usually the, that's usually it, right?

**Sydnee:**

Exactly. Well, if you weren't, if you didn't have a clean water source because you did live in a, you know, in a socioeconomically depressed area and you didn't have access to clean water, you were much more likely, then, to come in contact with the bacteria and get cholera.

**Justin:**

Mm-hmm [affirmative].

**Sydnee:**

But it wasn't that, it wasn't the lack of cleanliness. And certainly, you could be a rich, clean person who got cholera.

**Justin:**

So how did he, how did he test this out?

**Sydnee:**

So to test out this theory, he thought, "What cleaner person do I know-"

**Justin:**

[laughs] Yeah!

**Sydnee:**

"... than Max Joseph Von Pettenkofer?"

**Justin:**

White gloves all the time, brushes his teeth four times a day, I'll bet he was a real stickler for it.

**Sydnee:**

He's, he's a hygienist. That's his job.

**Justin:**

He's the cleanest dude ever.

**Sydnee:**

So he thought, "You know what? I'm gonna take that bacteria, I'm gonna get it, somehow, I'm gonna get that bacteria in me, and I'm gonna prove that I'm not gonna get cholera because it's not just the bacteria, it's being dirty." So how can you best make sure that you get the cholera bacteria?

**Justin:**

Uh, I d-, I don't know.

**Sydnee:**

Well, find somebody who had cholera.

**Justin:**

Oh, and just, like, hang out near them and, like, smooch them maybe, or...

**Sydnee:**

Well, do you know, uh, this might help. Do you know what cholera causes?

**Justin:**

No.

**Sydnee:**

How the disease manifests?

**Justin:**

I'm sorry.

**Sydnee:**

Massive diarrhea. That's the easiest way to explain it. Massive, massive, watery diarrhea until you dehydrate to death, except now we can fix it and save your life. Back then we couldn't.

**Justin:**

It would, that book would not have sounded as good if it was called *Love in the Time of Pooping Yourself to Death*.

**Sydnee:**

[laughs]

**Justin:**

That would not as be as good of a title.

**Sydnee:**

[laughs] Cholera's not a romantic disease, even though people like to make it one.

**Justin:**

No.

**Sydnee:**

No, you poop yourself to death.

**Justin:**

Okay.

**Sydnee:**

Which is very sad, but...

**Justin:**

W- wait a minute.

**Sydnee:**

Yeah. So where does, where are you gonna get the cholera?

**Justin:**

Oh no!

**Sydnee:**

Oh no. Yeah. So he, n-, he wanted to make sure he did it right. He didn't just find somebody who had cholera, he found somebody who died of cholera-

**Justin:**

Uh-huh.

**Sydnee:**

... got a sample of their, [laughs] of their diarrhea-

**Justin:**

Yeah?

**Sydnee:**

... mixed himself up a drink-

**Justin:**

No, don't! Wait!

**Sydnee:**

... and he dr-

**Justin:**

Don't! Max Joe!

**Sydnee:**

... and he drank it. [laughs]

**Justin:**

No! No!

**Sydnee:**

And it makes you feel better-

**Justin:**

Nothing can make me feel better!

**Sydnee:**

[laughs] ... by the end of the disease-

**Justin:**

I'm in hell!

**Sydnee:**

... by the end of the disease process, it actually has turned your stool into, like, what they describe as rice water, so-

**Justin:**

Wait, 'cause it turned it into a, like, a, a mojito?

**Sydnee:**

No, it just-

**Justin:**

Does it turn it into cherry Koolaid? 'Cause it's not!

**Sydnee:**

It's just, it's like water with flecks of intestine in it, you know? It's not really-

**Justin:**

It's not, can you not-

**Sydnee:**

It doesn't look like poop anymore.

**Justin:**

Bad, bad thoughts, so how could you? I can't. Why, Max Joe? Max Joseph, please come back to me! Please!

**Sydnee:**

Here's what's crazy-

**Justin:**

What's crazy, Syd? Go on!

**Sydnee:**

[laughs]

**Justin:**

I have some theories. Maybe drinking the poo poo of a dead man?

**Sydnee:**

[laughs]

**Justin:**

Perhaps? Like my man, Max Joe did, perhaps? Drinking a dead man's poo poo?

**Sydnee:**

[laughs]

**Justin:**

That's not cra-, go o-, what did he do afterwards? Just ate a whole cheesecake. Just get nuts.

**Sydnee:**

[laughs]

**Justin:**

What could he do that's gonna, s-, b-, crazier than drinking a dead man's poopy?

**Sydnee:**

He didn't really get that sick.

**Justin:**

Oh, not as sick as I am right now, in one of the great ironies.

**Sydnee:**

He got, he got sick, he got diarrhea, he did get, he did become ill, but he got, um, what was, what th-, we later figured out was probably just a mild case of cholera. He probably didn't get a very infectious dose.

**Justin:**

Some light cholera.

**Sydnee:**

He got, he got some light cholera. What he interpreted as was, "I didn't get sick, see? I got a little sick, but not that sick-"

**Justin:**

I nailed it!

**Sydnee:**

"... because I'm clean. Proven right."

**Justin:**

I nailed it.

**Sydnee:**

And he's, uh, remembered forever as a pioneer in the field of hygiene, he's on a stamp.

**Justin:**

G- g- [laughs]

**Sydnee:**

And he drank cholera poop.

**Justin:**

Congratulations, Max Joseph.

**Sydnee:**

And lived to tell about it. Why would you tell anybody about it though?

**Justin:**

I'd never tell anybody about it. This was discovered two years ago when his great-great grandson broke the family's most dearly held secret.

**Sydnee:**

[laughs]

**Justin:**

So who's next?

**Sydnee:**

Okay. So our next-

**Justin:**

I have to get the taste out of my mouth, if you know what I mean.

**Sydnee:**

We're gonna hang out in Germany though, for this next one.

**Justin:**

Oh God. This is the place where he did that. I can't be here anymore.

**Sydnee:**

We're fast forwarding though.

**Justin:**

Okay.

**Sydnee:**

Poor Max Joe died in 1901. Uh, Werner Forssmann, our next, uh, candidate, was born in 1904. So see, we're, we're way into the future, and we're in Berlin now, where he studied and got an MD. He was focused on the idea

that you could, uh, deliver medications, better image and measure blood pressure of the heart, from the heart, if you could get a catheter directly there. So that was his interest, was, "How can we get a catheter directly into the heart?" Because he thought that, like I said, you get a better measurement of pressure that way, and maybe we could take pictures if we inject some dye there.

**Justin:**

Okay.

**Sydnee:**

So i-, heart catheterization. That was his kind of area of interest. He thought that there was a way to safely do that by accessing a vein.

**Justin:**

Mm-hmm [affirmative].

**Sydnee:**

Most people believed that if you tried to stick something in the heart, you'd kill the person. [laughs]

**Justin:**

Yes.

**Sydnee:**

Which was a fair belief.

**Justin:**

Yeah.

**Sydnee:**

Well, I mean, it's not true. We do heart caths all the time now-

**Justin:**

But I can see how you would think it's sensitive in there .

**Sydnee:**

Sure. And he didn't buy it. He said, "No, no, there's a way to do this." He tried to work with the chief of his department to get him, you know, "Hey, I wanna try this out on some people. Won't you let me do this procedure?" Nobody would let him. So he said, "Okay, well, can I try it on myself?" Well, the ch-, again, the chief of, of, uh, his medicine department said, "No, you



can't experiment on yourself." So he went and got the head OR nurse, who was in charge of supplies, and said, "Hey, I really wanna do this thing. Will you help me out?" And she agreed, but strangely, only if she would, if he would try it out on her.

**Justin:**

Mmm. I think they were in love.

**Sydnee:**

Do you think they were in love?

**Justin:**

That's what I think.

**Sydnee:**

Maybe she was heroic.

**Justin:**

Maybe she was heroic. Wh-, oh, you mean, like, literally heroic.

**Sydnee:**

Yeah.

**Justin:**

Do you mean, like, heroic like heroic medicine, or heroic like, just like-

**Sydnee:**

Oh, no. Like, just her-, you know, maybe she was a hero. Maybe she was like, "Do it o-, go ahead, cath me, doctor!"

**Justin:**

"I trust you."

**Sydnee:**

"Use me for your research!"

**Justin:**

Maybe she wasn't in love with him.

**Sydnee:**

I don't know.

**Justin:**

Maybe he was in love with her.

**Sydnee:**

Maybe she wanted to make a name for herself. Maybe she wanted to be famous.

**Justin:**

I don't know why, I don't know why I feel like I have to ship everybody in medical history.

**Sydnee:**

[laughs] You really do.

**Justin:**

Anyway.

**Sydnee:**

Maybe she was just really cool and she was like, "I want my name in the history books!"

**Justin:**

Maybe. She was trying to get, get, get her, her name in lights. She saw the great success that Max Joseph had with his thing that he did.

**Sydnee:**

[laughs] And this didn't s-

**Justin:**

She saw that stamp!

**Sydnee:**

This didn't seem nearly as bad.

**Justin:**

N-, like, better! I would do this first, instead. Sorry, go ahead.

**Sydnee:**

So he agreed to do it, but once they got to the OR and got set up, he strapped her to the table, he numbed up her wrist, and then he proceeded to go ahead and cath himself as he had planned on doing the whole time.

**Justin:**

Why'd he numb her wrist?

**Sydnee:**

So that she wouldn't know that he wasn't doing it.

**Justin:**

Oh. [laughs]

**Sydnee:**

He numbed up her arm and said, "Now, you're not gonna feel anything because you're all numb."

**Justin:**

Don't look.

**Sydnee:**

And I mean, the truth was she wasn't gonna feel anything 'cause he wasn't actually, you know, cathing her.

**Justin:**

Oh, nice. [laughs]

**Sydnee:**

Instead, he then numbed up his own arm and passed the catheter through, what tha-, called the antecubital vein, it's the vein right inside your elbow.

**Justin:**

Okay.

**Sydnee:**

It's where they draw blood.

**Justin:**

Mmm.

**Sydnee:**

Uh, so he cathed himself, pushed the catheter in a pretty good distance toward his heart, but he wasn't sure if it was really there or not, so they had to go check in radiology. So at that point, he had to, you know, unstrap the nurse, admit to her, "Hey, I know your arm's numb, but there's no catheter

in it. But could you help escort me downstairs to radiology so we could see where the heck this thing is that I think I've stuck in my heart?" So they went down and they checked it out in radiology, and, uh, he advanced it a little further and managed to stick the catheter right into his right ventricle.

**Justin:**

Wow!

**Sydnee:**

Yeah.

**Justin:**

What a hero.

**Sydnee:**

No. [laughs]

**Justin:**

No?

**Sydnee:**

Not a hero. I mean, this sounds really cool, he cathed himself, he later went on, you know, that was kinda the pioneering of the procedure. Um, a lotta people were not cool with this, the chief of medicine, the, you know, i-, his, e- eventual mentor wouldn't-

**Justin:**

Nobody-

**Sydnee:**

... work with him.

**Justin:**

... ever respects a hero. People are always so jealous.

**Sydnee:**

They thought it was stupid, they thought it was reckless, they said, "Forget this, this is not how medicine is done." So he tried to find a group of people who would kind of, um, appreciate somebody with questionable ethics, and he found them.

**Justin:**

Oh no.

**Sydnee:**

The Nazis.

**Justin:**

Werner!

**Sydnee:**

Nope, so not-

**Justin:**

Werner!

**Sydnee:**

... not a good guy. He, uh, he joined [laughs] the Nazi party, he worked as a medical officer with the Nazis, he spent some time in an American POW camp, as a result.

**Justin:**

Yeah! We got him!

**Sydnee:**

But then-

**Justin:**

What are you gonna do to a man that jammed a needle in his own arm?

**Sydnee:**

And cathed his own heart. I don't know, and I think what we, what we decided to do with him, eventually, strangely, was let him outta the POW camp and then honor him in medical societies across Germany, Sweden, and the US. He was actually a member of the American, uh, Academy of Chest Physicians.

**Justin:**

"Listen-"

**Sydnee:**

American Society of Chest Physicians.

**Justin:**

"... we all did some things. We all-"

**Sydnee:**

Yeah.

**Justin:**

"We've all made mistakes."

**Sydnee:**

It's a-

**Justin:**

"Look at Max Joseph Von Pettenkofer."

**Sydnee:**

It's not, I wouldn't call this a cool guy. A lotta these people I'm talking about are, like, cool guys who just made some bad choices. [laughs]

**Justin:**

Yeah. This guy made some bad choices followed by some super, super duper bad choices.

**Sydnee:**

Yeah. So-

**Justin:**

All right. So-

**Sydnee:**

But he is the first, first person to be heart cathed.

**Justin:**

That's enough about him.

**Sydnee:**

Let's talk, let's go to London.

**Justin:**

Stupid Nazis. Yeah!

**Sydnee:**

Let's go to London. Let's round it out with something that I promise you is not gross at all.

**Justin:**

Okay.

**Sydnee:**

So John Hunter, born in 1728. He was a London doctor, and at this time in London, when he was practicing medicine, it was booming. It was a city on the grow.

**Justin:**

[laughs]

**Sydnee:**

[laughs] And wherever you have, uh, industry and business and population explosions, what do you gotta have?

**Justin:**

Uh, a lotta restaurants, I guess, a lotta infrastructure to keep up with that, um, b-

**Sydnee:**

Prostitutes, Justin.

**Justin:**

Prostitutes.

**Sydnee:**

Prostitutes.

**Justin:**

Oh yeah, well, prostitutes. I was gonna say prostitutes next.

**Sydnee:**

So there were lots and lots of prostitutes there. And as a result, there were, there was lots a lots of venereal disease. At the time, it was believed that there were pretty much two main classes of venereal disease: um, syphilis and gonorrhea. The pox or the clap. And most doctors believed that you either had one the other or both, and they were two distinct illnesses. Um,

one was bad, gonorrhea, 'cause it, it was terrible to have, but wouldn't kill you and was relatively, uh, brief, whereas syphilis was something that could kill you and was really bad. Now, John Hunter, he didn't buy this theory. He thought that the, it was the same disease; there's one venereal disease, syphilis and gonorrhea are the same thing, there's just two different stages of it. You got gonorrhea first, uh, from some sort of poison that you probably got from another person. We understood that it was kind of sex-, we, we kinda knew it was sexually transmitted. We had that, that idea. So you got some sorta poison from another person, it gave you the symptoms of gonorrhea, which was mainly local, mainly, you know, pus coming out of your privates, and then it spread to your whole system and you got syphilis.

**Justin:**

Ooo, ooo, ooo! That's not right, right?

**Sydnee:**

That's right!

**Justin:**

I know that.

**Sydnee:**

It's not right. They, they are definitely two distinct diseases.

**Justin:**

Can't beat me, John Hunter. Even I knew that! Jerk.

**Sydnee:**

But he really wanted to prove this theory. But how do you prove it?

**Justin:**

I don't know.

**Sydnee:**

Well, you have to find somebody who you know, with, with complete certainty, has never had gonorrhea or syphilis and give them gonorrhea, and then you wait and see. If they only get gonorrhea, well, then, they're two distinct illnesses. If they get gonorrhea and then later get syphilis, okay, now that's the same illness. You've proven it. But you've gotta find somebody that you are 100% sure does not have either disease.

**Justin:**



So he picked himself.

**Sydnee:**

Of course.

**Justin:**

Yeah, right.

**Sydnee:**

And how to give yourself gonorrhea?

**Justin:**

Uh-huh, I'm not gonna, no, I, I can't imagine, Sydnee.

**Sydnee:**

Well, so you get some, some pus from a guy who's got it, so you get some-

**Justin:**

Uh-

**Sydnee:**

... puss-

**Justin:**

One of the more awkward conversations you can have with a stranger.

**Sydnee:**

"Could you give, could, w- would you go, take this cup..." [laughs]

**Justin:**

"Do you have s-, gonorrhea?" Man, I was gonna get there. I was con-, trying to come up with a cute way to ask that.

**Sydnee:**

Well, no, he was a doctor, so he had access to people with gonorrhea.

**Justin:**

Oh, that's a good point.

**Sydnee:**

Take some of the puss and give it to yourself. Now, how to inoculate yourself most, uh, certainly to get the disease? Well, why don't you just make some superficial cuts into your own penis and then put the pus in them?

**Justin:**

You said-

**Sydnee:**

I lied. [laughs]

**Justin:**

You said it wouldn't be gross, and now you do this to me?

**Sydnee:**

[laughs]

**Justin:**

Your hus-, the father of your child? How could you make me think about a guy rubbing penis pus on his own penis with gonorrhea? Gonorrhea penis pus!

**Sydnee:**

[laughs] This is how he decided-

**Justin:**

This show's supposed to be safe for children!

**Sydnee:**

... to give himself gonorrhea!

**Justin:**

This show isn't safe for anybody!

**Sydnee:**

[laughs] I'm not using profanity!

**Justin:**

Yeah, yeah you are! You're using emotional profanity. Visual profanity. That's what you're doing to me.

**Sydnee:**

Predictably, he got gonorrhea.

**Justin:**

Yeah, super gonorrhea! He got amazing, super gonorrhea!

**Sydnee:**

You know what's sad, is that-

**Justin:**

Yeah, I know-

**Sydnee:**

... he later-

**Justin:**

... what's sad, Sydnee.

**Sydnee:**

Well, I mean, he got gonorrhea, that's sad enough. But he later went on to develop a characteristic syphilis chancre. I know, now you're thrown for a loop.

**Justin:**

So wait a min- [laughs]

**Sydnee:**

A chancre is the initial, it's the initial sore that you get with syphilis, looks kinda like an ulcer.

**Justin:**

Uh-huh.

**Sydnee:**

That's, so he developed one.

**Justin:**

Why?

**Sydnee:**

They, they even named it, by the way.

**Justin:**

Really?

**Sydnee:**

The Hunterian Chancre, for John Hunter.

**Justin:**

Oh.

**Sydnee:**

So he briefly had a venereal disease named after himself.

**Justin:**

"I, I, th-, oh, that chancre? That's named after the original one on my wiener!"

**Sydnee:**

[laughs] That's the Hunterian Chancre.

**Justin:**

"That's the Hunterian Chancre you got, right there."

**Sydnee:**

So okay, he's still wrong though. Why do we know he's wrong?

**Justin:**

I don't know.

**Sydnee:**

'Cause we figured out that the patient had both. [laughs]

**Justin:**

[laughs]

**Sydnee:**

The patient he got the pus from had already gotten gonorrhea and syphilis!

**Justin:**

Oh, oh John.

**Sydnee:**

He managed to, uh, he was wrong. He set medicine back, like, half a century with this result, 'cause it took us forever to figure out what the heck happened and was he right or wrong, and he gave himself both gonorrhea and syphilis. [laughs]

**Justin:**

What a super great week for John Hunter.

**Sydnee:**

So-

**Justin:**

Oh, man.

**Sydnee:**

Ah, I don't know if you'd call these guys brave, stupid-

**Justin:**

It's a little bit of column A, a little bit of column B, I think. But, uh, I'm certainly happy to have made their acquaintance, except for half of them, which are, uh, the worst people in history that would subject me to these things, and I'll never sleep well again, so thank you.

**Sydnee:**

I think, I think Walter Reed is the only one I'd wanna sit down to dinner with, personally.

**Justin:**

Yeah. Uh, but that's gonna do it for us this week on, uh, *Sawbones*. We hope you've enjoyed yourself, uh, and not thrown up in your mouth, basically.

**Sydnee:**

Sorry about that.

**Justin:**

Uh, yeah. Uh, super, super sorry about all that. Thanks to everybody tweeting about the show, like, Nicole, uh, Imwingit, Steve Spalding, Mark Haze, Polluk Patel, Rachel Taylorbear, Xena Gen-, Barnison, Barnison, yeah, there we go. Uh, Bethany Packwood, uh, our buddy, Keri Poppy, Blistopher, James something, Tristan Morris, Josh Butler, uh, Amy Chatwin, so many others. Uh, super duper appreciate that. Um, please tell your followers about our show this week. You can link them to [sawbonesshow.com](http://sawbonesshow.com), where they

can find us. Uh, we're on Twitter @Sawbones. Um, she's @SydneeMcElroy, S-Y-D-N-E-E, M-C-E-L-R-O-Y.

**Sydnee:**

And he's @JustinMcElroy.

**Justin:**

That's me! Uh, there are a ton of great shows just waiting for you to listen to them on the Maxfun Network. There's, uh, *Jordan, Jesse, Go, Judge John Hodgman, Stop Podcasting Yourself*, uh, uh, uh, *the Goose Down, Lady to Lady-*

**Sydnee:**

*My Brother My Brother and Me.*

**Justin:**

Oh, thank you so much. And *Oh, No Ross and Keri*, that's Keri Poppy, there. Uh, and, and there's a, there's a lot of others, so you should totally listen to all of them and you'll, like, really enjoy it, and you'll love them and, you know, have a great time. There's forums, too, so you can go, uh, chat about it, and, um, our episodes and, and all the other shows. Uh, I wanna remind you to go to [boatparty.biz](http://boatparty.biz), uh, to register for the, uh, Atlantic Ocean Comedy, and, uh, Music Festival.

They have, uh, it's, it's a, it is a cruise that is headed, uh, out this July, uh, and you are going to be able to set sail with a boat load, a literal boat load of great comedians. This is July 25th through the 28th. Uh, they got W. Kamau Bell, uh, Guy Branum, Tony Camin, Chris Fairbanks, Moshe Kasher, Karen Kilgariffs, Kyle Kinane, uh, my mouth is shutting down, Morgan Murphy, Natasha Leggero, John Roderick, personal friend that I haven't met but seems like a nice guy, uh, that's [boatparty.biz](http://boatparty.biz). You can go, uh, register for that and you will have the time of your life, I assure you. And everyone's name on the boat i- is impossible to pronounce, s- so you can have fun with that.

**Sydnee:**

You gave it your best.

**Justin:**

I s-, you know what, I gave it the old college try. Anyway, uh, that's gonna do it for us. We will be sure to join you next Tuesday with another episode of *Sawbones*. Until then, I'm Justin McElroy.

**Sydnee:**

I'm Sydnee McElroy.

**Justin:**

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

[theme music plays out]

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