

Sawbones 180: The Papanicolaou Test

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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 martial tour of misguided medicine. I'm your co-host, Justin McElroy.

Sydnee:

And I'm Sydnee McElroy.

Justin:

Uh, Sydnee, I... Okay, so let me start the first one. Uh, so I go to see my gynecologist, right, and this guys—

Sydnee:

Whoa, whoa, hey wh—what are you doing?

Justin:

Uh, uh, you... well, you interrupted me. I'll— I'll start from the beginning. So I go to see my gynecologist and this guy's like—

Sydnee:

No, wait, wait, wait. What is... What is this thing? What is this—this character, what is this whole... I... Seriously, what is this?

Justin:

Um, well you— you had said that, uh... you had said that this episode there wasn't... A, wasn't a lot of, um, bad medicine that we could make fun of, and B, um, there... it was about Pap smears.

Sydnee:

Yeah.

Justin:

So you— you told me... you said I should come up with some Pap smear jokes. So I just wrote—

Sydnee:

Well, no I didn't—

Justin:

I got a stack here.

Sydnee:

Eh...

Justin:

I got like seven or eight Pap smear that, um—

Sydnee:

Do they have books of Paps? I don't wanna know.

Justin:

No, I wrote... I wrote them. These are all—

Sydnee:

Oh, originals.

Justin:

... these are all my original Pap smear jokes, but yeah.

Sydnee:

Um, I don't... I don't think I said make Pap smear jokes, I don't... I can't see—

Justin:

Yeah.

Sydnee:

... I can't see me saying that.

Justin:

Yeah.

Sydnee:

I don't think that's right.

Justin:

Yeah, like Pap smear. You said—

Sydnee:

No, no, I don't... Did—did I tell you to write bits about Paps?

Justin:

And Pap smear. I got another one. Let me, uh, try this one. Um, so I'm... he's saying, "Spread them," and I'm like—

Sydnee:

No, we... No, let's not. These—no, I can't see them going well. I don't see this going well for you.

Justin:

Okay, well, maybe my pre-written material, maybe it should be more organic.

Sydnee:

No, yeah, yeah, I mean, that's not the exact kind of humor I think this— this show... Like, our whole show really—

Justin:

Mm-hmm.

Sydnee:

... you know, the merits, like that's not really our style, you know?

Justin:

Yeah, yeah.

Sydnee:

I mean, it's a great... It's great. It's a great style and your jokes, after we're done, after we're done with the whole show, recording it and like done putting everything together like the music on it and then people listening to it and it's all safe and sound, then you can tell them to me.

Justin:

Oh, okay. Kinda like private and you'll keep them to yourself.

Sydnee:

Like a private show.

Justin:

Okay, that's fine.

Sydnee:

Yeah, okay?

Justin:

Yeah, deal.

Sydnee:

But for now let's just... we'll just stick to like the show.

Justin:

Yeah, that's... I guess that's fine. Just go ahead and talk about Pap smears in like a boring way and I'll—

Sydnee:

Well, thanks, good. So everybody who's tuned in to listen, Justin promises to be boring.

Justin:

No, I'm going to try to be—

Sydnee:

That's a great set up for a podcast. I can tell you're a professional.

Justin:

I'm gonna try to do some great live improvisational humor—

Sydnee:

Mm-hmm.

Justin:

... I'm just not gonna be able to do any of my pre-written bits that I came up with. It's fine.

Sydnee:

Okay, well, first of all, thank you James and Ester for recommending the topic of Pap smears. If there's one thing a cytopathologist loves to talk about, it's Pap smears. [laughs] So, and I do too.

Justin:

Great.

Sydnee:

Let's go for it.

Justin:

Well, we're in great company.

Sydnee:

I know. [laughs] Um, at the turn of the century, uh, the diagnosis of cervical cancer was pretty devastating. It was pretty... It was seen as pretty hopeless, um, that, you know, in speeches given by doctors at the time and researchers in this area, uh, they were basically like, we just don't have... We don't have a lot to... We don't know how to identify this disease, uh, it tends to be pretty advanced by the time we diagnose it. And at that point, when it the... Of course at this point in history, we don't have a lot of great treatments for it, uh, so you know, basically, we really need a lot of help in this area.

Justin:

Okay.

Sydnee:

You know? Um, so enter Dr. George Papanikolaou. He was born in 1883 in Kymi, Greece and he was initially not—

Justin:

In, um, what? Kymi, Greece?

Sydnee:

Kymi.

Justin:

It's unfortunate.

Sydnee:

Kymi, Kymi.

Justin:

Uh, Kymi Greece is, uh—

Sydnee:

[laughs]

Justin:

... was also my Gorgeous Ladies Wrestling name, uh, that I used. Uh, I was a champ a couple years running.

Sydnee:

You were a champ?

Justin:

Yeah, I was the champ of—of GLOW.

Sydnee:

Were you like a bad... Were you like a— a... like one of the bad ones, like one of the—

Justin:

I was a heel, yeah. I was a heel, and then I had a face turn that... and I turned good.

Sydnee:

I don't what the means but okay.

Justin:

Okay.

Sydnee:

Uh, so initially he, uh, Dr. George was initially interested in music and the humanity's, um, influence heavily by, I think his mom was into music and, uh... and he really wanted to explore that, but his physician father convinced him to follow in his footsteps instead, and, uh, after, uh, completing university, he went on to medical school.

Justin:

Mm-hmm.

Sydnee:

Because his dad was a physician in his hometown, and he kinda wanted his son to come home and... after his training and inherit like the family business.

Justin:

Family biz, okay, sure.

Sydnee:

Yeah, exactly. Uh, so he finished in 1904, initially he also, uh, joined the military and he worked as an assistant surgeon, and then he also spent some time working in between, I guess, uh, assignments, back in his hometown, uh, probably with his dad, um, with the local population of patients that had leprosy. So he pro... he did a lot with that population in helping to improve living conditions and sanitation and that kinda stuff.

Justin:

Mm, okay.

Sydnee:

Um, but he got bored of this after a while, of like, clinical medicine. He always kinda of suspected that seeing patients wasn't his calling.

Justin:

Okay.

Sydnee:

That he— he didn't wanna spend, kinda doing what I do, talking to people and seeing them in the office, and diagnosing, that kind of thing. He just—

Justin:

He wanted adventure.

Sydnee:

Yeah, he kinda did want adventure.

Justin:

Okay.

Sydnee:

He liked sailing, he like being out on the sea, and he also liked, well, and I don't know if you consider this adventure, he also like, uh, bench work is what we could call it, uh, meaning like a laboratory scientist—

Justin:

Oh.

Sydnee:

...sitting at a bench and looking at things under microscopes.

Justin:

When you say... When you say bench work in your day-to-day life, is it... you can be honest with me here, is it, uh, with a derogatory tone like office jockeys—

Sydnee:

No, no. [laughs]

Justin:

... like that kind of... like a desk jockey, right?

Sydnee:

Not at all. It's... It— It is not... you cannot think of them in a hierarchy.

Justin:

Stuck on the bench Johnson. Get back on the bench.

Sydnee:

No. [laughs]

Justin:

You can't handle the scalpel.

Sydnee:

There— There are two... It is... Uh, there are areas in science where paths diverge, and there are people who clearly like doing like laboratory research, bench work, that kind of scientific research, and then people like myself who clearly wanted to pursue science in order to do clinical medicine, interact with people and do that—that end of it. And it's just what you love. It just depends on what you love.

Justin:

Oh, or what you hate, which is the other group. Whichever one you didn't do is the one you hate.

Sydnee:

No, you don't hate them. [laughs] You don't hate the other group, but you might hate the work that the other group has to do and never wanna do it yourself.

Justin:

Right, you're happy that there are people to do it.

Sydnee:

Exactly, yeah, very happy. Um, so he wanted to pursue a little bit more of a research path. So he actually went to Munich and studied zoology...

Justin:

Mm-hmm.

Sydnee:

... and he got a PhD there. Um, and he actually... he also after that worked in Monaco for a time, he joined the oceanographic exploration team that the prince of Monaco lead. Do you remember this team from our anaphylaxis episode?

Justin:

Yes, they had a stamp, right?

Sydnee:

They did. The— The team that discovered anaphylaxis that the prince of Monaco took out on a... on a science cruise—

Justin:

The... A fun science cruise for the whole family.

Sydnee:

Yeah, that was back in like 1901. I think Dr., uh, Papanikolaou went on one of the cruises, the science cruises in 1911, uh, went along in like a physiology type role. Um, so he also... he also worked with the prince of Monaco, and during all of these travels, he ran into, actually, uh, I think on a boat when he was traveling back and forth somewhere, he ran into a woman named Mary who he had known when he was younger and their families had kinda been friendly and then he got to see her again, and they started talking, and they fell madly in love and he got married and she would become his wife.

And, uh... And it also plays a very important role in the story. Uh, so the First Balkan War happens, and Dr. Papanikolaou has to kinda go back to his military role at this point, kind of abandon all of his... all of the scientific pursuits and—

Justin:

Okay.

Sydnee:

... go back to actually being a doctor. And while he is in the military... while he is actively in the military, he starts interacting with people who are from and have been to the United States, and they start telling him about all of the job opportunities in scientific research and medicine and those kinds of careers that are available in the United States, and he's excited and intrigued and wants to pursue that. So in October of 1913, uh, this young couple head to New York City. Uh—

Justin:

So pretty much the most American place you could go. You're going to go to America.

Sydnee:

Yeah.

Justin:

It's always... It's always struck me as odd that they... like if you're... uh, for a lot of people who are coming to America that like you come into New York City. It's sorta like the most trial by fire sort of like—

Sydnee:

[laughs]

Justin:

... you know what I mean? Like, oh, you wanna see America and you're looking for a different culture? Well, check this out, fire hose, like—

Sydnee:

I know, it's almost like—

Justin:

... full of culture.

Sydnee:

It's almost like the... you get this impression like if you can make there—

Justin:

Okay.

Sydnee:

... you could make it, I mean, anywhere.

Justin:

I can't believe you've done this.

Sydnee:

[laughs] So anyway, they— the head through Ellis Island, uh, they head to New York, neither of them speak any English by the way, uh, and they... it— it costs at this point in time about 250 bucks to enter the US.

Justin:

Mm-hmm.

Sydnee:

They have like a couple bucks over that.

Justin:

Wow.

Sydnee:

I mean, they have just enough to get in, and then they've gotta try to—to make it work and pursue their dreams. So initially, both Mary and George, uh, get jobs at Gimbal's Department Store.

Justin:

Oh.

Sydnee:

Uh, Mary is working as a seamstress and George works as a rug salesman for one day.

Justin:

[laughs] It just doesn't work out?

Sydnee:

It just doesn't... Uh, I'm not exactly sure, I did read one account, but I never saw this repeated that he— he, on his first day of work, he had to sell a rug to a woman who he had seen in like the first—class cabins on the boat on his way over—

Justin:

Mm-hmm.

Sydnee:

... and it was embarrassing for him, and he just couldn't do it. And so he just left.

Justin:

Mm.

Sydnee:

Uh, so anyway, he didn't work out as a rug salesman, he had a couple other odd jobs. He played violin in a restaurant, he worked as a clerk at a newspaper. Um, but he finally landed a job at New York University's pathology department, and soon thereafter, also at the anatomy department at the Cornell University Medical College. Now when he got this job, which is exactly the area he was wanting to work in—

Justin:

Right.

Sydnee:

... uh, Mary actually quit her job at Gimbal's and came along as a, uh... as a technician in his lab.

Justin:

Oh, did she ha... Oh, that's cool.

Sydnee:

And she work alongside him in his lab for the rest of his career, helping him out and becoming a technician. Probably would've been one of the earliest, uh, female, you know, uh, lab technicians, research assistant, that kind of thing in the role that she plays. Uh, but she was never paid, she just helped—

Justin:

Oh.

Sydnee:

... and so I don't know that she ever gets that title because she didn't technically have a job, you know?

Justin:

She was more of an amateur.

Sydnee:

Yeah, she was like a... [laughs] She did it for fun. Her hobby—

Justin:

For fun, for kicks, right, yeah.

Sydnee:

Her hobby was cytology, yeah. [laughs] It's everybody's—

Justin:

On the side, just for a laugh, everybody's gotta have their thing.

Sydnee:

Yeah. So initially his research focused mainly on guinea pig reproductive cycles. I mean, of course, right?

Justin:

Nice.

Sydnee:

I mean, that's what everybody would wanna go into first.

Justin:

You know what I'm into. You know my thing.

Sydnee:

[laughs] The only problem was as he was... as he was doing his research and—and let me—let me preface this part of the story right now, uh, his is researching guinea pigs, he's doing research on guinea pigs, and I'm about to talk about some aspects of scientific research involving animals that may be unpleasant for some listeners.

Justin:

Okay.

Sydnee:

So I'd like to preface with that. If that's the kind of thing you don't wanna have to hear, you may wanna skip ahead—

Justin:

Sure.

Sydnee:

... I don't know, 30 seconds to a minute.

Justin:

[laughs] It depends on how deep we go. Like, you're— you're really into it, I don't know.

Sydnee:

Yeah. The— The problem is that he needs to harvest ovaries from the guinea pigs at a specific moment in their cycle in order to understand more about the guinea pig reproductive cycle, and that involves some guess work, 'cause he didn't know exactly where the guinea pigs were in their menstrual cycles. So, uh... And so that would result in sometimes he would guess wrong and he would sacrifice a guinea pig to remove the ovaries and he... and it was wrong. And then that was, you know—

Justin:

That's sad, right.

Sydnee:

... that's sad. So it occurred to him that just like menstruating members of other species, guinea pigs have cycles and probably vaginal secretions that change with their cycle. Menstruating humans have vaginal secretions that change as their cycles change.

Justin:

Okay.

Sydnee:

We've talked about this before, that like, the viscosity, the thinness or thickness of the vaginal fluid can help you tell if somebody is ovulating or—

Justin:

Sure.

Sydnee:

... you know, what— what stage they are when you're looking for like fertility and trying to get pregnant and that kinda thing.

Justin:

Their fortune is and...

Sydnee:

Exactly.

Justin:

Right.

Sydnee:

[laughs] What kinda... What— What, uh, zodiac sign they would match best with, you know?

Justin:

Kickboxing, there's—there's really nothing you can't tell.

Sydnee:

[laughs] True.

Justin:

It's like a snowflake, how everyone's different.

Sydnee:

Vaginal fluid, it's—it's amazing. Um, so he thought if you can do this with humans, you could probably figure this out with guinea pigs as well. So he started... he actually went out and bought a tiny little nasal speculum, so like little teeny device used to look up the nose... it was actually a pediatric one, so look... used to look up tiny little nostrils just to kinda hold the nostrils open and look up there. He got a tiny little nasal speculum and started using it to examine guinea pigs and collect their vaginal secretions.

Justin:

Mm-hmm. Pretty... I mean, I've had weirder days, but not...

Sydnee:

[laughs] So he starts collecting the vaginal secretions of guinea pigs and examining them on microscope slides, and as he notices differences in the fluid over time in the cellularity and different aspect of the vaginal secretion, he can actually perfectly predict the guinea pig's cycles. That's why he started this research—

Justin:

Yeah.

Sydnee:

... that's why he started preparing these, what we call, smears where he would take a sample of fluid and smear it on a slide and then look at it. He started doing that so that he could try to predict exactly when a guinea pig was ovulating, right?

Justin:

Right.

Sydnee:

You follow?

Justin:

And still the world, the world held its breath, certainly, he's going to figure it out soon.

Sydnee:

[laughs]

Justin:

We've just got to know.

Sydnee:

So from this, and he published papers on this and he was very successful, but from it he began to wonder what else we could learn from vaginal secretions, particularly if we—

Justin:

The future—

Sydnee:

[laughs] Particularly in—in the human animal, what can we learn from vaginal secretions? So he started collecting vaginal secretions from volunteers, uh, for hi... from—from human volunteers, for his laboratory and examining them on slides just to look at the different points in the cycle, what does it look like, and that kind of thing. In the midst of this, he happened to collect a sample from a patient who was... who had known, who had diagnosed cervical cancer, and he noticed a very clear difference in the cells that he saw on the slide from the patient with cervical cancer than he had seen on the slides from patients who didn't have cervical cancer.

Justin:

Oh.

Sydnee:

And this is the beginning of a huge breakthrough. I know it... I know you're wondering where I've been going with these guinea pig vaginal secretions.

Justin:

[laughs]

Sydnee:

Well, I'm about to tell you.

Justin:

Oh, tell me.

Sydnee:

Well, first I'm gonna take you to the billing department.

Justin:

Let's go.

[theme music plays]

[ad break]

Justin:

So Syd you were... Uh, you had me in suspense about what he did with the information that these cells from, uh, the vaginal fluids in the woman that had been diagnosed with cervical cancer were different.

Sydnee:

Right. Now, before I... before I tell you the... before I tell you what happens next in the story, I do think it's important to mention another doctor. Uh, Dr. Papanikolaou was not the only doctor to call attention to the fact that you can tell the difference between cancer and non-cancer cells with a technique like this. You know, collecting some sort of secretion or fluid and looking at the cells, uh, and being able to tell the difference. You know, the... He was not the first or the only physician to figure this out. There was a British physician, Walter Hayle Walshe, who had already done with lung cancer, um, and then there was a Romanian physician, uh, Aurel Babeş—

Justin:

Mm-hmm.

Sydnee:

... who had actually used a different method to diagnose cervical cancer. He— He was actually using... looking at the same thing, uh, he just used a slightly different instrument and his preparation was different, and it—it's crazy, both him and Dr. Papanikolaou published and presented their results—

Justin:

Mm-hmm.

Sydnee:

... I mean, within months of each other.

Justin:

Wow, really?

Sydnee:

But we are talking about one physicians who's practicing in the United States and one physician who is practicing in, uh, Romania, we have no evidence that they two knew about each other at all. So this was just one of those moments in scientific history when two smart people probably came up a very similar solution as a very similar moment in time. Um—

Justin:

It— It's a, um... There's a term for it. Um, multiple discovery.

Sydnee:

Mm-hmm.

Justin:

Happens pretty commonly. Actually, it's—it's a very odd phenomenon because it, uh— uh, you... it subscribes to the theory that ideas, uh, arise through like, fluid networks.

Sydnee:

Mm-hmm.

Justin:

So they're... It's not just one person who's coming up with in independently, it's these ideas coming together and someone is the person that—

Sydnee:

Sure.

Justin:

... you know sort of identifies it. It's really fascinating. More common than you'd think.

Sydnee:

Which it makes sense, it makes sense because at this point in history, uh, the standard for diagnosing cancer was some sort of tissue biopsy. So it was actually, at the time, we didn't have a lot of non-invasive techniques to do that. Meaning, we'd actually have to cut somebody open and take a sample of something to figure out if there was cancer or not and that procedure alone was dangerous. So—

Justin:

Mm-hmm.

Sydnee:

... people were looking for a safer, you know, easier way, less invasive to diagnose cancer sooner, you know, more quickly so that we could do something about it. So the two of them came with up with very similar techniques. Uh. Dr. Papanikolaou is the one who we will... as we move forward, we will discover gets most of the credit for it, and is most associated with the procedure. But to be fair, the test we're about to talk about in Romania is actually called the Babeş-Papanikolaou test in honor of this physician who also figured out something very similar. So anyway, uh, Dr. Papanikolaou collects more samples, standardizes his procedure and published in 1928.

Justin:

Okay.

Sydnee:

Uh, "Here are my result, here are some pictures of some cells with cancer, here's some pictures of some cells that didn't have cancer, I did all this just with a simple vaginal, you know, smear. I got some fluid, I smeared it on a slide, it was all very easy, and I was able to... You know, and this would be a way to diagnose cervical cancer. Isn't this great?"

Justin:

The world rejoiced.

Sydnee:

No.

Justin:

No.

Sydnee:

Nobody was particularly interested.

Justin:

Oh.

Sydnee:

Everybody said, "Well, that's all well and good, but you still gotta get a biopsy. You still gotta go in and get a biopsy." So it didn't really make a lot of waves. He went and presented his findings actually at what was called the Race Betterment Conference, uh, in Battle Creek to a bunch of eugenicists.

Justin:

Ew.

Sydnee:

Yeah.

Justin:

Very common at the time.

Sydnee:

Yeah.

Justin:

Still yucky—

Sydnee:

I know.

Justin:

... but it's like... it's not... it... I... it's important to know that there was a... at this period, there was a... before we kinda saw, oh, that really broke bad over there, like that really did not work out well over in Europe.

Sydnee:

There was... Yeah.

Justin:

Um, there's a lot... It was common—

Sydnee:

Mm-hmm.

Justin:

... school of... a racist one, but— [laughs]

Sydnee:

A ver... No, a very racist one. It's always hard when, uh... I had told Justin this before we did this episode. Whenever I'm studying a physician or a something that is said in this time period in the US, I always get really nervous... Well, not just in the US, in a lot of places, but, uh, because this is the moment when there was a eugenics movement in this country and I'm always terrified that I'm going to find out that this person I'm researching, that they were involved or they were part of it and then, uh, and it's awful.

Justin:

[laughs]

Sydnee:

And I mean, we've talked about Dr. Kellogg and we mentioned that he was related... I mean, he was part of the eugenics movement and it's terrible.

Justin:

Yeah, and I know... I know it was common to like soften the fact—

Sydnee:

No.

Justin:

... and it's just like I—

Sydnee:

So this is just this moment. In case you didn't know, there was a eugenics movement in this country.

Justin:

Yeah. It was popping off. Yeah, um—

Sydnee:

Yeah. And— And that's a—

Justin:

But—

Sydnee:

It's important to remember it and recognize it—

Justin:

... it's.

Sydnee:

... so that it... we stop it from happening again.

Justin:

As near as we can tell 'cause you talked to me about this before. As near as we can tell though, this is as involved with eugenics as he got. He was—

Sydnee:

Exactly.

Justin:

His boss at the time, I guess, was, uh, deep in the field and convinced him to come to present there. But—

Sydnee:

Yes, yes. Exact... As far as we can tell, this the only interactions he'd had. I have no evidence that says Dr. Papanikolaou had to do personally with eugenics, had any... You know, I— I don't... I don't find anything that says

that. So he— he presented it and they weren't even particularly interested in it either. He kinda said, "Look at this cool technique I've got, it's great, we should use it." And they said, "Well, no, we're really into a lot... A lot more awful stuff?"

Justin:

Yeah.

Sydnee:

"This seems like a great thing for mankind, and that's not really..."

Justin:

"That's not really our bag."

Sydnee:

"That's not really where we're at right now."

Justin:

Yeah.

Sydnee:

"We're gonna stuck with Kellogg and his yogurt enemas."

Justin:

Mm-hmm.

Sydnee:

"And we're good."

Justin:

"If you come up with anything about race purity, please just..."

Sydnee:

"You can call us back."

Justin:

Open door.

Sydnee:

I can imagine him like backing out of the room like slowly—

Justin:

Look.

Sydnee:

... and the turning and being, "Oh, what was that?" And like taking off.

Justin:

[laughs]

Sydnee:

So none of this deterred him. This is... This is one thing you've gotta know about this guy, he was nonstop. He worked seven days a week, and according to most sources I read, never took a vacation in his entire career. There was one that said he actually did take one vacation. [laughs] Either way, this guy worked seven days a week his entire life.

Justin:

Wow.

Sydnee:

He was... And not because he had to. He said the work was too interesting to leave it. He couldn't stand the thought of not working on it, he had to keep working on. He loved it.

Justin:

Kindred spirit.

Sydnee:

[laughs] He absolutely loved it.

Justin:

That's me, yeah.

Sydnee:

That's you?

Justin:

Mm-hmm.

Sydnee:

Never taken an vacation?

Justin:

No. I just don't believe it in. I'm a work horse, Syd.

Sydnee:

Right.

Justin:

Love my craft.

Sydnee:

Uh, so his wife... his wife stuck with him. Uh, like I said, she worked in the lab with him, she was a technician.

Justin:

I mean, that seems like the only way to see him, right?

Sydnee:

That's true. Well—

Justin:

If you wanna... If you wanna hang out with your boy, [laughs] he's at, uh... he's at the office again.

Sydnee:

Not only that, there were times early in his research when he referred to a special case that he studied, a special case that he studied for 21 years and collected vaginal secretions from and learned a lot from—

Justin:

Very intimate.

Sydnee:

... it's— it's now pretty much thought that, that's his wife that he... So not only did she volunteer to help him out, uh, with— with the actual lab techniques, but she also one of his, uh... one of his samples. [laughs]

Justin:

Yeah.

Sydnee:

Um, uh, either way, he continued to work and collect data, and he started collaborating with a Dr. Herbert Trout, uh who was, uh... worked in the gynecology department at, uh... at New York Hospital and was actually able

to have contact with more patients. And through the two of them working together, they began to basically do a Pap test on every patient with a cervix who came into the hospital.

Justin:

Mm-hmm.

Sydnee:

Uh, so just collect tons and tons of samples. Uh, and then in 1943, they gave it another go. So together they published Diagnosis of Uterine Cancer by Vaginal Smear, and it just... I guess it was the right moment in history at this point, plus they had a lot... the data was a lot more robust, they had a lot more samples—

Justin:

Sure, right.

Sydnee:

... uh, and they published this paper and everybody went nuts.

Justin:

Right.

Sydnee:

Because here was this quick, easy, cheap, and pretty reliable test to diagnose cervical cancer.

Justin:

Nice.

Sydnee:

And the medical community embraced it. He was a little nervous about that at first, actually, only because, uh... not because he didn't want people to use it, but he didn't want people to do it wrong.

Justin:

Mm.

Sydnee:

So he was a little nervous about widespread use because he was afraid that people would start complaining it didn't work because they weren't doing it right.

Justin:

Right.

Sydnee:

He strikes me as the kinda guy who probably would have minded like going around and teaching everybody independently. Like, "Listen, if you're gonna do this"—

Justin:

"I've got the time."

Sydnee:

[laughs] "Just do it right, okay?"

Justin:

"I'm not on vacation."

Sydnee:

"It's gonna have my name on it." So Dr. Pap as he... as he came to be called after this. So the test, the, um, Papanikolaou test, or Papanikolaou smear quickly became known as just the Pap test or the Pap smear.

Justin:

Yeah.

Sydnee:

Uh, and— and because of that, he became known as Dr. Pap. I actually kinda went backward. [laughs]

Justin:

One of the... That didn't really happen to Anglo-Saxon names very often, does it?

Sydnee:

No.

Justin:

You know, it really does... It seems like people just go ahead and say the whole.

Sydnee:

Exactly, yeah, yeah. So Dr. Pap, as he came to be called by most of his, uh, colleagues and students and such, went on to become a professor at Cornell University Medical College, he published four books, over 100 articles, he got tons of awards in the US and Greece and Italy, honorary degrees, he was on the 10,000 drachma note before the... before the euro.

Justin:

Right.

Sydnee:

Um, and he was on several Greek stamps and a US stamp, he is also known as the father of exfoliative cytology—

Justin:

Doesn't exactly trip off the tongue.

Sydnee:

... which, uh, you know, I mean, if there is a greater honor than that, I don't know that it is.

Justin:

Yeah.

Sydnee:

Uh, he left Cornell for Miami to help them develop their cancer institute in 1961. He'd kept promising he was gonna retire, promising he was gonna retire, and he just never could 'cause he loved the work so much. And he finally said, "You know what? At least we'll move to Miami and I'll kinda work as a consultant and advisor and develop this." And unfortunately, he passed away three months after arriving there at the age of 78. They still did name the Miami Cancer Institute the Papanikolaou Cancer Research Institute in his name.

Justin:

How nice.

Sydnee:

Um, and this is part of why you'd this... you'd think this guy would have a Nobel for this. He was considered, and he was passed up initially, they were still considering him for the next year, uh, but there was this debate about who came up with the test first. Was it Papanikolaou or was it Babeş? And they were... And not that this... not that they had decided not to give it to

him, but because there was some discussion and debate and they weren't sure, they were holding off and then—

Justin:

Mm.

Sydnee:

... he passed away. So then he couldn't get one.

Justin:

And then— And then the other guy's like, "Well, I mean..."

Sydnee:

"I'm still here.

Justin:

"I'm still here. Do you wanna... Go ahead and prize me, please."

Sydnee:

[laughs]

Justin:

"I'm still ready."

Sydnee:

I— I actually have no idea if he was still there at the time or not. I don't know. I don't know.

So the... Let's talk about the Pap smear. It's reduced mortality from cervical cancer in the US by 70% since the 1940s.

Justin:

Wow.

Sydnee:

Uh, do you... Just briefly, do you know what a Pap smear is, Justin?

Justin:

Well, you go to a person with a cervix, and you put a... I'm gonna say what I think it is.

Sydnee:

Uh, would you rather me tell you? [laughs]

Justin:

No—

Sydnee:

Okay.

Justin:

... you asked me.

Sydnee:

Okay.

Justin:

You asked me.

Sydnee:

Carry on.

Justin:

You get a cotton swab—

Sydnee:

No, carry on.

Justin:

[laughs] Okay, not great. All right. So you get a cotton swab, or a sco... scepulum? You get at scrublum and you put in there—

Sydnee:

[laughs]

Justin:

... and then you smear in on a slide and you put a cover slip on there and you... first you put on some dye to—

Sydnee:

Dye?

Justin:

... some contrast dye—

Sydnee:

Right, oh, ooh.

Justin:

... to help push it along, and then you put the top on the slide and you put in under your microscope, focus please, and get the right magnification and check it out—

Sydnee:

And then—

Justin:

... check out the cells.

Sydnee:

Okay. So, I mean, there are clo... you're close. I mean, even some people I think who've had Pap smears are always sure what exactly is happening. You know, I—I always try to talk through as I'm telling people, you know, here's what—here's what happening. But, uh, basically, what we do is we take either, uh, what looks like a little spatula, like a little wooden kind of spatula thing, or like a little... we call a little broom, little, uh, rubbery, plastic, soft broom kind of thing, and we use it... we have to use a speculum so that we can visualize, we can see the cervix, which is just the bottom part of the uterus, and we use that to brush it in the center of the cervix where the opening is, called the os, and collect some of those cells. That's all we're trying to do is just use that to collect some of cells. We put in a little... Now, we use like a liquid prep for the most part. They used to just take that and smear it on a slide.

Justin:

Mm.

Sydnee:

Now we actually like rub it around on a little, um, bottle of liquid.

Justin:

Mm.

Sydnee:

Wash it around in there, get some of the cells in there, they take that. There's a pre... There's a whole preparation that they do with it now. It's—

It's a little more complicated than it used to be. One way or another it ends up smeared on a slide and examined again.

Justin:

Got it.

Sydnee:

So, uh, the reason that this test is so great, of course, again, is because we can identify free cancerous cells as well as cancer cells. We can even tell when somebody might be likely to develop cervical cancer.

Justin:

At some point.

Sydnee:

Yes.

Justin:

Yeah.

Sydnee:

Which is great. Um, among patient that do die of cervical cancer each year, it's... it... about half of them never got a Pap smear, which is just I only mentioned this to prove that getting Pap smears is very effective.

Justin:

Sure.

Sydnee:

Um, and about 10% more were at least five years out of date on when they needed their Pap smear. So, again, not just getting them, but getting them when you're supposed to is very important. Uh, we used to do Paps yearly on everybody. Uh, this was a thing that changed pretty fre... pretty recently in medical history.

Justin:

I remember, I saw, yeah.

Sydnee:

Yeah, we used to do them, uh, at age 21 or three years after you start having sex, and then yearly thereafter. Now, we start them at 21 and we do them less frequently, it depends then on your age and your risk factors and

whether or not you've ever had abnormal ones. So I don't wanna give you a hard cut off, but some patients could be only every three years.

Justin:

Okay.

Sydnee:

Um, we do them less often because we found that we were doing them too much and we were doing too many procedures and maybe we didn't need to do them that often. Either way, it's important that if you have a cervix, you are seeing your physician, asking them when you need a Pap smear, and getting them in the recommended time intervals. Because we know that it saves lives. Um, there are all kinds of interesting things when it comes to cytopathology, like, uh, do you know pathologists can only read so many slides in a day like legally?

Justin:

Oh, really.

Sydnee:

You're prohibited from reading more.

Justin:

Why?

Sydnee:

It's a... It's a quality control measure.

Justin:

Oh, okay, because they— they don't want them rushing to get through.

Sydnee:

Exactly. Yeah. Yeah, but there's a... There's actually like, I guess, a lot of political stuff tied up in this because now it's a semi-automated procedure, so it's not as hard to do. But there's still these limits and, I don't know. I was... I was told in some of these emails that there's a lot of political stuff. I don't know what it is though.

Justin:

Yeah.

Sydnee:

It's not my world.

Justin:

Yeah.

Sydnee:

I don't know. Um, now just on a side note, we also have the Gardasil vaccine. I wanted to mention that just to give it a quick plug.

Justin:

Yeah.

Sydnee:

The Gardasil vaccine is a vaccine that can prevent, uh, some strains of human papillomavirus, which is the virus that causes most cervical cancer. Not all but most.

Justin:

HPV.

Sydnee:

Exactly, HPV. So it was the first vaccine developed that can prevent... that can prevent cancer. It doesn't prevent all, but it can prevent cancer. Uh, it is a great vaccine, I unequivocally throw my support behind it, uh, it absolutely is something that I believe all people should get. We now give it to younger people. Around age 11 we start recommending it. It's a series of three vaccines, and, uh, hopefully, we will see a time where while we still do Pap tests, we find a lot less cancer when we do them, thank you to the Gardasil vaccine. That being said, a lot of us were too old to get it—

Justin:

Yeah.

Sydnee:

... which is why Pap tests are still important. I w... I am too old to have gotten it. Uh, not only that, the vaccine is still not 100% effective in that it can't cover every single strain of the virus, and there are people who aren't infected with the virus who can get cervical cancer. So it's still important to get your Pap tests. Um, there are other new tests for cervical cancer, but the Pap test is still winning out as one that's, you know, like I said, cheap and easy, and quick, and uncomfortable—

Justin:

Mm-hmm.

Sydnee:

... but not painful.

Justin:

Mm-hmm.

Sydnee:

Uncomfortable but not painful. Um, and we're improving our methods every day so...

Justin:

And they're pretty inexpensive and easy to get right now, right Syd?

Sydnee:

Well, Justin, they should be. Uh, if you have insurance, usually your insurance should pay for you to get screening Pap smears at the regularly recommended intervals, whatever that may be for your age group and risk factors and whatnot. So every one to three years. Obviously, there are places where you can get it for free if you don't have insurance. Places like the health department here. Actually a lot of... I know a lot of patients that go to the health department 'cause they provide free, uh, cervical cancer screening, and Planned Parenthood provides cervical cancer screening.

Um, it's essential that those, uh, places continue to survive and provide the service to continue to save... I mean, 70% reduction in mortality by having widely available Pat tests. So it's essential that these a service... that these services are available.

If your insurance does not cover this, or if you do not have insurance and there are not free services available funded, you know, by charitable organizations or the government to provide it, we're going to start seeing more people die from cervical cancer. I mean, that's the end of the story. It's too expensive for you to just go pay for.

Justin:

Yeah.

Sydnee:

The doctor's visit alone is gonna be crazy expensive, I mean, if it's something you have to pay for out of pocket. Then plus the procedure that

the doctor's doing, plus the lab fee for having it prepared and read, it would be prohibitively expensive for most people to do out of their own pocket. So it's essential that these services are provided, they save lives, period.

Justin:

And not to stand on the soapbox for too long, but it's pretty cool that it was able to immigrate here too, right? Hooray.

Sydnee:

You know, [laughs] I think it's pretty cool.

Justin:

I think cool... pretty darn cool.

Sydnee:

I think I'm glad to claim Dr. Papanikolaou as a... as a fellow American.

Justin:

Uh, folks, that's gonna do it for us. Thank you so much for listening, we hope you have had fun. Thank you, thank you. A million times thank you to everybody that donated to the Maximum Fun Drive. It was a massive success. Syd and I did a really funny video on YouTube, remember? It was fun.

Sydnee:

Yeah.

Justin:

Yeah. But you remember? You're looking at me like I—like I'm making it up.

Sydnee:

Oh, we did do a really fun video on YouTube.

Justin:

Okay.

Sydnee:

I for... I was just thinking it was live.

Justin:

Yeah, it was like two hours long.

Sydnee:

Well, it was live.

Justin:

Oh, we're pushing it to YouTube, but it's—

Sydnee:

I see, well, I didn't... I didn't know that.

Justin:

If you search for Sawbones live on YouTube, you can watch it and enjoy it. But, uh, we talked about pretty much everything under the sun. Uh, and, uh, thank you to The Taxpayers for letting use their song Medicines as the introduction for our program.

Uh, head on over to maximumfun.org. Hey, here's a plug we don't do very often. If you, uh, wanna buy one of... some of the Sawbones whatchamacallit, go to maxfunstore.com and, uh, you'll find a Sawbones t-shirt, uh, with our logo, and you'll find one designed by Taylor Smirl, Sydnee's sibling, with a very cool skull and stuff on it. But it's neat.

Sydnee:

It's very cool.

Justin:

It's very cool. There's a ton of cool Max Fun gear on there for you to pick up. Uh, but anyway, that's gonna do it for us, folks. Uh, thank you so much.

Sydnee:

Yeah, thank you all so much. I didn't say thank you right away 'cause I was getting a secret doctor text. But thank you.

Justin:

Sydnee has a secret doctor texting system, did you know this?

Sydnee:

I did... I do.

Justin:

It says, "Doc Halo, secure message." It's very cool.

Sydnee:

It does. And anyway, I was getting one. But thank you, thank you, thank you Fun Drive, every... uh, the Max Fun Drive. Thank you everybody who donated. You guys are great, we love you, thank you, thank you.

Justin:

That's gonna all for us folks. Until next week, my name is Justin McElroy.

Sydnee:

I'm Sydnee McElroy.

Justin:

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

[theme music plays]

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