Sawbones Episode 61: Vitamins

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Intro (Clint McElroy):

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[theme song Medicines by The Taxpayers plays]

Justin:

Hello, everybody, and welcome to *Sawbones*: A Marital Tour of Misguided Medicine. I'm your co-host Justin McElroy.

Sydnee:

I'm Sydnee McElroy.

Justin:

Good news, Syd.

Sydnee:

What is that?

Justin:

We've got the food of 2014.

Sydnee:

Food of 2014?

Justin:

I've selected my food of 2014.

Sydnee:

Now, I'm really excited to hear what it is-

Justin:

Good.

Sydnee:

... but before you tell me, I think you should probably explain why you have a food of 2014.

Justin:

Okay. Well, I- I- a lot- a lot of people probably don't do this. Uh, I didn't intend to do it, but I found that every year there's a new food that I get super deep into that I hadn't previously been a big fan of.

Sydnee:

Do you remember the first thing?

Justin:

French onion soup. That was back in 2011.

Sydnee:

I remember that. I remember that.

Justin:

Yeah, 2011 was a big year for french onion soup. I tried it for the first time and I just lost my mind. Uh, and I was sad for all the french onion soup I'd missed before that point.

Sydnee:

And then the year after that, I think it was ketchup. Is that right?

Justin:

Ketchup was... Yeah, ketchup was 2012. Huge year for me and ketchup. Had never been a fan, then I just couldn't get enough of the stuff.

Sydnee:

Yeah. He had never really eaten ketchup.

Justin:

Yeah. And then I got super deep into ketchup in 2012. And then 2013, it was yogurt. Big year for yogurt for me. Just getting...

Sydnee:

Justin's diet was very limited. I think prior to... I don't... Me?

Justin:

Have you guys tried yogurt? Have you tried this thing, yogurt? Uh, it is a, uh, it- it's- it's a- It's great. But anyway, we got a new smash food for 2014 and it is... salad.

Sydnee:

Oh, great choice!

Justin:

Thank you. Well, my brother Griffin has a system called cookies points where he awards me points I can redeem for cookies dependent on salad and/or vegetables that I eat. So I wanted to start racking up more cookie points. And the best way of doing that is to eat a lot more salad.

Sydnee:

That's great. I mean, I'm glad you're gonna start eating salad. I mean, I like that one.

Justin:

I'm in to, like, three dressings that I like, and I'm really finding a lot of great things to try.

Sydnee:

Well, hold up on the dressings. But this is great. This is great.

Justin:

Y' know the best thing about salad, Syd?

Sydnee:

What is that?

Justin:

Other than that crunchy taste that you just can't get enough of and it fills you up, and also croutons?

Sydnee:

Right, right. Well definitely croutons.

Justin:

No, the best thing about it is the vitamins.

Sydnee:
O- Okay.

Justin:
Green and leafy means vitamins for me-fee.

Sydnee:
Do- Do you think that everything green and leafy has... Like that's where all vitamins are? Just green leafy things?

Justin:
Yeah. That's where your- your high concentrations of vitamins are. And I know that’ cause I’m eating salad. I'm getting a lot of vitamins.

Sydnee:
Which vitamins, in particular, do you think you're getting?

Justin:
Vitamin... D or maybe K?

Sydnee:
Uh... Well, m- maybe. Yeah.

Justin:
Vitamin S-

Sydnee:
Maybe.

Justin:
... for salad.

Sydnee:
Well. Oh, okay. Do you know what- Do you know anything about vitamins?

Justin:
I literally don't. I literally suggested this *Sawbones* topic to you because I have no idea what vitamins are. I- I don't know if you've got a big pile of

vitamins. Would it be like [laughs] dust? Like what a- I- I don't know what vitamins are.

Sydnee:
Well, why don't I tell you what vitamins are?

Justin:
Tell me what vitamins are. I have no idea. I'll be eating a salad.

Sydnee:
First of all. So what are vitamins?

Justin:
Yeah.

Sydnee:
I think that's a good place to start.

Justin:
What are vitamins?

Sydnee:
So the definition of vitamins are organic compounds-

Justin:
Mm-hmm [affirmative].

Sydnee:
... uh, that humans, or whatever organism we're talking about, let's say humans for, you know, argument sake, since we are humans-

Justin:
Humans.

Sydnee:
... that we absolutely need to survive, in small amounts-

Justin:
Mm-hmm [affirmative].

Sydnee:

... but we can't make ourselves. So that's what constitutes a vitamin. If something meets those, you know, um, criteria.

Justin:

Then it is a vitamin.

Sydnee:

If it's an organic compound that we have to have to survive, in very small amounts, but we can't make it. So we need to get it from the food we eat. Right?

Justin:

Mm-hmm [affirmative].

Sydnee:

The name comes actually from vital amine. Vital because it's vital to our survival. And amine because amine is a kind of, a type of, of chemical compound-

Justin:

Mm-hmm [affirmative].

Sydnee:

... has a certain group on-

Justin:

Like amino acids?

Sydnee:

Sort of. Amine refers specifically to a, um, a certain configuration of-

Justin:

Oh, okay.

Sydnee:

... of chemicals. But anyway, the important thing is, uh, not all vitamins are amines. So the vitamins used to be called vitamines, like with an E on the end. Um, but they later dropped the E and just became vitamin because they found that there are many vitamins that don't... that aren't actually amines.

Justin:

Okay.

Sydnee:
Or, well, I shouldn't say many. Just really important ones that aren't amines.

Justin:
Okay.

Sydnee:
So... So vitamin, that's where it comes from.

Justin:
Vitamin. Got it.

Sydnee:
So, it's not a new idea that there are things we need from certain foods that are important. Uh, this was something that, even before we ever knew what a vitamin was, the ancient Egyptians recognized that if somebody had night blindness and they ate a whole bunch of liver, they got better.

Justin:
Hmm.

Sydnee:
Now they didn't know why that worked.

Justin:
They probably thought it was magic.

Sydnee:
Yeah, they probably did. They probably thought it had something to do with, with the, I don't know, the Egyptian God of Liver.

Justin:
Don.

Sydnee:
Don, the Egyptian God...

Justin:
Don, the Egyptian God of Liver.

Sydnee:
He got, like, last pick in, like, the...

Justin:
Yeah. Uh, liver? I guess...

Sydnee:
I guess. Sure. Um, it was actually because liver contains vitamin A and if you have vitamin A deficiency you can get night blindness.

Justin:
Did they g- discover vitamin A first?

Sydnee:
No, they didn't discover any of that. They just put together that if you eat liver, you won't be night blind.

Justin:
Oh. But was vitamin A the first one they came up with? Like was... Or did they just call it vitamin?

Sydnee:
Well, they didn't call it anything.

Justin:
Okay. I'm getting ahead of myself.

Sydnee:
Yeah. You're getting way ahead of yourself.

Justin:
Sorry, sorry.

Sydnee:
Now let's... I'll- I'll get to when we start naming vitamins.

Justin:
Liver... Here's what we've established so far: liver. Okay. Moving on.

Sydnee:

Yeah. And this was, this is similar a- this is the story about vitamins that probably most people know: uh, scurvy.

Justin:

I know that one. Vitamin C. Pirates.

Sydnee:

W- Okay. Sailors, not just pirates.

Justin:

Mmm… I think sailors could get to vitamin C. I think it was more a problem for pirates. Sailors had the, the foresight to bring citrus fruits with them. Pirates had to plunder to try to get citrus fruits.

Sydnee:

[laughs] Do you think that's what pirates were after? Citrus fruits?

Justin:

"Arg. Shiver me lemons."

Sydnee:

[laughs]

Justin:

Stupid.

Sydnee:

Um-

Justin:

What if you could only get... What if you had scurvy really bad, but the only thing you could get was lemons. That's kind of a bummer.

Sydnee:

That's actually a good thing.

Justin:

What? Well I know about not for flavor.

Sydnee:

Oh, well, no.

Justin:

'Cause you have to eat a lemon.

Sydnee:

But for vitamin C, it's a good thing.

Justin:

Yeah. I don't know. After months of sea a lemon might not be so ba- Anyway, sorry. Getting distracted by lemons. It's me-

Sydnee:

So, scurvy. As most of you probably already know, it was a disease that involved gum bleeding. I think it's the thing everybody remembers.

Justin:

Mm-hmm [affirmative].

Sydnee:

Right? Isn't that always the thing people say like, "Oh, your gums are bleeding. You've got scurvy."

Justin:

I think of, like, being hunched over. That's what I think of with scurvy. Or having a hunchback.

Sydnee:

Well, not necessarily hunchback. But, like, you'd be really tired and weak. So you might walk hunched over...

Justin:

Eh? Okay. That'll work.

Sydnee:

And it seemed to disproportionately affect sailors. But also, they noticed like a seasonal variation-

Justin:

Hmm.

Sydnee:

... during winter months, people were more likely to get scurvy.

Justin:
Huh.

Sydnee:
Which would make sense because in a time before we could have anything we want any time of the year, you wouldn't have access to citrus fruits-

Justin:
That makes perfect sense to me.

Sydnee:
... during the winter. Um, i- in 1747, James Lynn noticed this and figured out that fresh fruits seemed to... Crews that had access to fresh fruits, seemed not to get the disease known as scurvy. And so he started advising crews to take fresh fruits with them. Not... Again, not knowing-

Justin:
Not knowing, right.

Sydnee:
... about vitamin C or what anything was, just knowing that people who ate fresh fruit didn't get scurvy. Now, obviously, like any other good idea, it was- it was completely rejected at first. [laughs]

Justin:
Oh yeah. Nobody, nobody believes this. Maybe... Th- They're sailors. They don't need that kind of junk. Fruits are for sissies. We'll have mead and steak.

Sydnee:
Mead and steak?

Justin:
"Mead and salted steak. That's what fills a sailor's belly. Argh!"

Sydnee:
Didn't they just eat, like, hardtack?

Justin:
"Hardtack and salted steak and mead. That's all I need. Shiver me timbers."

Sydnee:

They actually thought that, um, scurvy was caused by having bad hygiene and that it happened when the sailor's morale was low.

Justin:

[laughs]

Sydnee:

So if you had just like, I don't know, throw a pizza party for 'em and have 'em brush their teeth afterwards.

Justin:

"Arg, what's wr- what's wrong with ya Reggie?"

"Uh, I don't know, captain. I, I think it's just the scurvies."

Sydnee:

[laughs]

Justin:

That's the Mondays before, before they had the Mondays, they didn't have Mondays in pirate times. So they would call 'em the scurvies.

Sydnee:

That's what Garfield had. He had scurvy.

Justin:

Pirate Garfield back in that, that time in the 1700s, 16, 1700s, he had, uh, he had the scurvies.

Sydnee:

You- You don't get enough vitamin C from lasagna.

Justin:

That's that's absolutely accurate.

Sydnee:

In the 1800s there was a lot of interest in trying to figure out, like, what is a good diet? Like, what do you need to survive? I don't know if this was so that we could feed, uh, the poor as little as absolutely possible, but one way or another, we were trying to figure out which things are critical to survival

in a diet. So the way that they went about trying to figure out which things were important was by feeding, um, various animals, especially mice, just certain components of the diet, and then seeing, like, which ones lived and which ones died and trying to piece together... Like, okay, if we give this one just protein and this one just carbs? And what if we give this one protein and carbs? And what they found... And they, like, the control was milk. They would give them mice milk for the control group.

Justin:

Okay.

Sydnee:

And what they found is that, um...

Justin:

'Cause that's half carbs, half protein.

Sydnee:

No, but it has... They knew that mice survived when they had milk.

Justin:

Okay.

Sydnee:

So, what they kept finding was that they would break milk down into the main constituents, which you did say, you know, protein and carbs. It also has fat and it also has salt in it. So they would break milk down into those components and then feed it to mice altogether.

Justin:

Mm-hmm [affirmative].

Sydnee:

So one group of mice got milk and the other group got protein, carbs, fat, and salt.

Justin:

Mm-hmm [affirmative].

Sydnee:

And those mice still died. Which led them to believe there was something in milk that we need that, you know, we can't isolate that easily. Something we don't know about yet.

Justin:

You know, I gi-

Sydnee:

So, there is something in like naturally occurring foods.

Justin:

I give old timey people a hard time a lot on this program. That's actually pretty good, pretty good, thinking back then.

Sydnee:

I- It was a good way to, to illustrate that there was more to food than, than what we knew at the time, but it- we still were a long way from figuring out exactly what that was.

Justin:

Hmm.

Sydnee:

Um, this continued in the late 1800s with, uh, some experiments with the Japanese Navy. Uh, and they were eating a, mainly a diet of polished rice. Which means that they would remove, like, the husk-

Justin:

Mm-hmm [affirmative].

Sydnee:

... from the, the rice… kernel? the rice...

Justin:

Grain?

Sydnee:

Grain. Yeah. The rice grain. Um, and they found that the, the crew, you know, like the, I don't know, the lowest rung of the Navy?

Justin:

Right.

Sydnee:
Whatever. I don't know anything about ranks.

Justin:
The germs, the peasants.

Sydnee:
The pe- The peasants in the Navy? [laughs]

Justin:
The ham and eggers.

Sydnee:
Naval peasants.

Justin:
Okay.

Sydnee:
Uh, they were just eating rice, this polished rice. And they were all getting sick and the officers were eating like normal diets, like normal human diets with varied foods, not just rice, and they were not getting sick.

Justin:
Okay.

Sydnee:
And specifically they were getting sick with something called beriberi.

Justin:
Okay.

Sydnee:
Um, beriberi causes a lot of different symptoms. Uh, some of the more notable ones, uh, difficulty walking and like pain in your... numbness and tingling in your legs and feet. It can even lead to dementia, heart failure... It can make you really sick. So it was a big deal. If, you know, your- a lot of members of your Navy are being stricken by this horrible disease. The way they figured out, uh, what was probably the cause was actually chickens.

Justin:

Hmm.

Sydnee:

They were feeding, like, naval surplus rice to chickens. And they found that chickens that were eating this like sweet, sweet Navy rice were getting beriberi more often.

Justin:

Hmm.

Sydnee:

And yet chickens who were just eating like natural unprocessed rice, didn't get this disease. So they figured out that there's something in like the husk of the, of the rice grain.

Justin:

That we needed to, to thrive.

Sydnee:

Exactly. That we need to survive. It turned out to be, uh, a B1 vitamin, thiamine. We didn't know that, again, at the time. But, um, this is when we really thought, okay, so we know where this thing that is important exists. It's in this little husk on the rice grain; let's start trying to find it. And so that was the first one we did discover. In 1910, we found thiamine, or vitamin B1, as it was later known, in rice bran.

Justin:

Mm-hmm [affirmative].

Sydnee:

And after that, the race was basically on...

Justin:

To find vitamins.

Sydnee:

Yes. So, we figured out there was this one vitamin we... Yes, there were probably a lot more. And over the next 30 years, that's exactly what people did. Um, they started, isolating vitamins. Uh, initially there were, like, vitamins, A, B, C... We know about A, B, C, D, E. Right?

Justin:
Right.

Sydnee:
We know about all those. And then K. And a lot of people are like, "Well, why," you know, "Why do we skip around?"

Justin:
That's a great question. I don't know.

Sydnee:
Where are the other vitamins?

Justin:
I hope you're not asking me. I hope you researched this. [crosstalk 00:14:53].

Sydnee:
No, I know. I'm gonna tell you why.

Justin:
Thank God.

Sydnee:
Because initially they just kept naming them each after a letter of the alphabet, A and then B and... And they kept going on, except they started to discover that a lot of these vitamins were really closely related.

Justin:
Hmm.

Sydnee:
So then they started grouping them all as B vitamins. That's why you get B1, 2, 3, you know, etc.

Justin:
Okay.

Sydnee:
Um, there were also a lot of other letters of the alphabet, as you can tell, you know, specifically between E and K.

Justin:

Yeah. We skipped around there.

Sydnee:

Right. But we eliminated all those when we grouped them with B vitamins. And then there were some things that we figured out that weren't vitamins. Like, we can make that so it doesn't classify as a vitamin or it's not really important...

Justin:

Did we stop at K? Is there a vitamin L I don't know about?

Sydnee:

There were other vitamins, but they've been eliminated.

Justin:

Oh, wow. Man, I miss those vitamins. What if we needed those? What if that's what makes you super tall?

Sydnee:

There was the proposed vitamin S at one point.

Justin:

From salad.

Sydnee:

No.

Justin:

I proposed it earlier.

Sydnee:

We can pretend it's salad.

Justin:

Okay. What was it?

Sydnee:

Salicylic acid.

Justin:

Oh.

Sydnee:
But that's not a vitamin.

Justin:
What's the difference?

Sydnee:
Well, I don't know. We don't need it.

Justin:
We just decided?

Sydnee:
No, we need it. We just decided it wasn't a vitamin.

Justin:
Fine. God, you scientists.

Sydnee:
I don't know. It didn't feed the d- fit the definition.

Justin:
Fine.

Sydnee:
It's not a vitamin.

Justin:
Fine.

Sydnee:
That's the important thing. Um, and as we were discovering all these vitamins, a lot of people won Nobel prizes for them. And...

Justin:
Vitamin fever was sweeping the scientific community.

Sydnee:
Right. It- It was, like, a really exciting time if you're into vitamins.

Justin:

And I am. Look at how much salad I eat.

Sydnee:

We isolated all these vitamins. We figured out what, uh, must be in a healthy diet. And this was when we started, you know, realizing, like, oh, okay, well rickets is caused by vitamin D deficiency so people need enough vitamin D to prevent that. And you know, scurvy is vitamin C. And, uh, there were all kinds of things. You know, you can get anemia if you don't have B6 or B12.

Justin:

Mm-hmm [affirmative].

Sydnee:

And there were dermatitises. And blindness can result from lack of vitamin A. Uh, bleeding problems from lack of vitamin K. So we figured all this out and that's great.

Justin:

The end.

Sydnee:

And there were no problems.

Justin:

Perfect.

Sydnee:

Until...

Justin:

Until?

Sydnee:

Obviously there's some break where we stop seeing vitamins as something that we're supposed to make sure we eat the right foods to get that small amount that we need to survive and we start considering vitamins something we're all supposed to take as a health supplement. Which I think is kind of how they're viewed today.

Justin:

Yeah.

Sydnee:
Would you agree?

Justin:
Kind of a magic, kind of a magic bullet. I think if you, if you have enough of, you know, these vitamins, then you'll be fine.

Sydnee:
The- There were of course, a lot of people doing experiments, you know, before what I'm gonna mention with vitamins, trying to figure out, you know, if a little bit is good, is a lot better? Uh, but Linus Pauling is really where we see vitamins take off. Now, if you are in- if you are a, of a, of a science mind, if you are a science person-

Justin:
And you know I am.

Sydnee:
You've probably heard of Linus Pauling.

Justin:
Oh sure.

Sydnee:
Tell me one thing about Linus Pauling, honey.

Justin:
I have the- your sheet in front of me. That's not really fair.

Sydnee:
Oh, okay. D- Before you looked at my sheet, did you know anything about Linus Pauling?

Justin:
No, I didn't.

Sydnee:
So here, let me just p- say this before I start making fun of him. He was a really brilliant scientist. [laughs]

Justin:
[laughs]

Sydnee:
Like super smart guy. He won two Nelbel- Nobel prizes. Um, the first one he, he wrote about the, uh, bonds between, um, elements.

Justin:
Mm-hmm [affirmative].

Sydnee:
And when he, when he submitted his paper to be reviewed, they actually sent it to Einstein to look at.

Justin:
Wow.

Sydnee:
Because they didn't think there was anybody smart enough to figure out like, is this paper good? Is this stuff correct?

Justin:
This- Is this guy making this up?

Sydnee:
And Einstein looked at it and was like, I don't-

Justin:
I don't get it.

Sydnee:
I don't know, it's way smarter than I am, basically.

Justin:
Wow.

Sydnee:
So this is the guy, thi- this is how smart this guy is. Um, the second Nobel prize he won, by the way, was for peace.

Justin:

[laughs]

Sydnee:
He won a peace prize because he worked really hard to stop nuclear p- proliferation. He refused to join the Manhattan Project 'cause as you can imagine, he was, they wanted him for it.

Justin:
Right.

Sydnee:
Um, he was instrumental in creating the Nuclear Test Band Treaty. Uh, he- I mean he was a really great, smart, super cool guy.

Justin:
Cool.

Sydnee:
But when he was 65, I think he must have gone a little nutty.

Justin:
All right. He didn't get enough vitamin K, or vitamin S maybe.

Sydnee:
He gave a lecture about, I don't know, something sciencey. And during the lecture he talked about, you know, when, if he is lucky enough to live another 25 years, then perhaps we'll see... and he talked about scientific advancement. So, total, just throwaway line in his little lecture. But a Dr. Irwin Stone who, I should clarify, was not actually a doctor per se. Um, he studied chemistry for two years and he got an honorary degree from a chiropractic school. And then he got a PhD from a correspondence school that didn't have accreditation. So we lose- we use doctor here very loosely.

Justin:
Got it.

Sydnee:
He was at the lecture.

Justin:
Like, uh, Dr. Feel Good?

Sydnee:
Yes. Like Dr. Feel Good. Or Dr. Pepper.

Justin:
Right.

Sydnee:
So Dr. Irwin Stone was at the lecture. And he wrote him a letter afterwards and he was like, "Hey, look, I can make sure you live 25 more years or even way longer than that. All you gotta do is take 3000 milligrams of vitamin C every day."

Justin:
That's a lot. It seems.

Sydnee:
It is. It's- It's well above the recommended daily value.

Justin:
One might say it's three grams of vitamin C.

Sydnee:
That's true. That is true. And for some reason, this brilliant genius scientist did it.

Justin:
This is the problem with s- super smart people, I think, that, uh, a lot of people miss. And we see it repeated thematically throughout history. And I think this probably applies to a lot of the people on our program is that smart people are so smart they can talk themselves into almost anything.

Sydnee:
A- I think this must have been one of those cases. And I don't know, maybe it was also a little bit of, like, he was 65 and he was starting to look down the road and think, like, "I don't know. I'm smart enough to know I only have so many more years left."

Justin:
"Maybe I'll give it a shot."

Sydnee:

Who knows? So, he tried it and he felt better. So he took more than that and he thought he felt even better.

Justin:

Wow.

Sydnee:

And then he was off. So vitamin C-

Justin:

Just oranges get outta the way. Don't keep an orange around this cat. He- He has to eat, like, insane, uh, Wimpy level amounts of... Like, as Wimpy is to hamburgers this gentleman is to oranges. Do not let an orange get into his... He's like Mr. Peepers.

Sydnee:

[laughs]

Justin:

Just de- destroys it.

Sydnee:

That's a hit *Saturday Night Live* reference you're making right there.

Justin:

It's not as old as my freaking, uh, *Popeye* reference from 15 seconds earlier, though. Thank you for- for letting that one slide.

Sydnee:

[laughs] So in 1971, Linus Pauling wrote, *Vitamin C and the Common Cold*, which sold- It was a book he wrote and it sold like crazy. I would imagine it probably sold a lot more copies than the paper he wrote on the bonds between electrons and various elements; I would say. [laughs]

Justin:

I think he maybe just wanted some money, it sounds like. He wanted... He was worried about vitamin C, R, E, A, M, as in cash rules everything around me.

Sydnee:

[laughs]

Justin:

He wanted to get paid. Linus Pauling was no nut. He was willing to eat 30 oranges a day if it meant he could sell you his stupid book.

Sydnee:

He was a man of science.

Justin:

[crosstalk 00:22:36], Linus.

Sydnee:

I like to think that at least he truly believed this.

Justin:

Yeah.

Sydnee:

He believed that you could take massive doses of vitamin C and it would not only cure your cold if you had it, but it would prevent you from ever getting a cold. And in this way we could completely eradicate the common cold.

Justin:

I'm pre- I'm being pretty hard on a dude that is putting out some things that I myself have attempted upon getting a cold.

Sydnee:

Yes, you have. Absolutely. That's part of why we're going to talk about vitamin C quite a bit.

Justin:

Excellent.

Sydnee:

Uh, in '73, he added flu to this. He actually talked about predicting, like, swine flu epidemics that could happen in the future. And did, to be fair. But he thought we could have prevented all these epidemics that have happened since by just eating enough vitamin C. And in response to this vitamin sales went bonkers. Um, everybody was reading this book and going out and buying as much vitamin C as they could.

Justin:

Couldn- Couldn't make it fast enough.

Sydnee:

Um, this, even at this point in '71, was not a particularly new idea. I mean, I- I already talked about this so-called doctor, Irwin Stone, who came up with this idea; it wasn't his idea either. A lot of people had tried to prove, you know, if a little is good, a lot is better. And no studies had al- had ever really shown any benefits.

Justin:

It's very potent idea, though. If you don't ha- If yo- you're not looking at the data that this thing is good for this thing so... As- As my old drama teacher, uh, uh, uh, uh, Professor Anthony used to say, "One rubber chicken is funny. 1,000 rubber chickens 1,000 times as funny."

Sydnee:

[laughs] Well, I think that vitamin C... I think that's a good comparison, 'cause vitamin C is as about effe- effective on a cold as a rubber chicken would be. So...

Justin:

[laughs]

Sydnee:

There you go.

Justin:

Pirates.

Sydnee:

And no matter how many more studies were done in response to his claims and the publicity that vitamin C was getting, um, proving that it didn't have any impact on a cold, it didn't matter. The, you know, it- the impact of his book was not to be touched by any science at that point. So, he took it a step further. He added cancer.

Justin:

Uh-oh.

Sydnee:

He got hooked up with a Scottish surgeon who had done a study where he gave 10 grams of vitamin C a day, 10 grams. So, that's a lot of vitamin C...

Justin:
That's a lot of vitamin C.

Sydnee:
Uh, to cancer patients in an effort to help them get better faster. And what his study showed is that the patients that got it, that got the vitamin C, he felt, were improving, in addition to their chemotherapy and everything, were improving faster than the patients who didn't. So he sent a copy of his study to Linus Pauling and Linus Pauling was, of course, thrilled.

Justin:
Deeply into it.

Sydnee:
Uh, he tried to get it published in the Proceedings of the National Academy of Sciences, which is abbreviated. Can you say that there for me, Justin?

Justin:
PNAS. [laughs]

Sydnee:
[laughs]

Justin:
Penis, penas, penus.

Sydnee:
Did scientists really... ? Do you have to be that oblivious?

Justin:
[crosstalk 00:25:46].

Sydnee:
No, I, I like to think they don't realize it.

Justin:
No.

Sydnee:
Come on.

Justin:
Come on.

Sydnee:
Come on. You're giving us all a bad name.

Justin:
Come on.

Sydnee:
Like some of us have common sense. So he tried to get it published there 'cause he was a member. And it was essentially a given that if you submitted a study and you were a member of this, you know, group that you- your study would be published because it was a respect thing. There'd been like one turned down ever or something.

Justin:
Mm-hmm [affirmative].

Sydnee:
And this one was turned down.

Justin:
This is number two.

Sydnee:
This was number two. It did later get published in a journal o- oncology obviously because you know, oncologists would be interested in this study, um, but it was picked apart as well. Uh, they found lots of flaws in the study. The people who were given the vitamin C were already healthier and already doing better and less advanced in their cancer. And so there were all kinds of flaws with the way this study was set up.

Justin:
I'm guessing this cat was not deterred.

Sydnee:
Oh, no. No, not at all. Um, for the next decade, this led to oncologists studying vitamin C-

Justin:

[laughs] Cold blind alley. Thanks, Uncle Linus.

Sydnee:

... on cancer patients, um, because as you can imagine as soon as this, you know, became an issue in the media, as soon as this was a big thing and, uh, patients and patients' families started hearing about it, they were clamoring for more research, you know, they were asking their doctors, "Can we give... Can we try the vitamin C thing? You know, this brilliant guy Pauling says it works."

Justin:

Right.

Sydnee:

"There's that study." Um, so they did all these studies and again, they didn't really show anything. We're still not seeing any positive effects from giving mega doses of vitamin C to patients. So then he decided, you know what, vitamin C's starting to get old and eventually they're gonna be on to the fact that it's not working. So, let's add some other vitamins.

Justin:

Oh, good. Branch out.

Sydnee:

So, he added vitamin A, vitamin E, uh, and then he threw in a couple other things: selenium, uh, beta carotene, in addition to your vitamin C of course; don't stop your vitamin C. And if you will take this regimen, I have a paragraph here of things you can fix. Um, pretty much anything. Uh, the big ones like heart disease, that's pretty big. Polio, that's a big deal at the time. Tuberculosis. Um, ulcers. You know... Diabetes.

Justin:

Uh, just looking at this list here. Asthma. Uh, heat frustration. Wounds. There- [laughs]

Sydnee:

[laughs] Wounds.

Justin:

It turns into Wolverine, apparently. Dysentery, whooping cough, leprosy, hay fever. Uh...

Sydnee:

Stress.

Justin:

Stress, rabies, snake bites. And also, it says here, AIDS.

Sydnee:

Yeah. So as the, um, as HIV became a known illness in this- the aids epidemic hit the US, uh, he went ahead and through that on the list too.

Justin:

So, that sounds suspiciously to me like a cure-all, Sydnee. And as we know from doing us- uh, over 60 episodes of Sawbones or so, cure-alls cure nothing.

Sydnee:

Cure nothing. Absolutely. Um, this, this vitamin fever that was now sweeping the country, because it really was in response to, as you can imagine, in response to patient's demand for vitamins, vitamin manufacturers were making more and more and more. And, um, more companies were popping up with different combinations of vitamins and billing them for different things. 'Cause with every, uh, study that was done that, you know, investigated something, people, at least, were wanting to try it out themselves because it gives it... I think just doing a study gives it an air of credibility.

Justin:

Yeah, I think so.

Sydnee:

Like, if you are studying whether or not vitamin C can cure cancer, then somebody thinks vitamin C can cure cancer.

Justin:

Serious people somewhere ar- are looking at it. Yeah.

Sydnee:

And so this led to, in 1992, uh, Time Magazine running a cover story about vitamins, which talked about a lot of some of these crazy claims. Not saying that they were necessarily true, but just throwing them out there and not mentioning the fact that there wasn't any evidence for them.

Justin:
Right.

Sydnee:
Um, and so at this point, you know, everybody wanted to take a vitamin. And- And I should say at this point what the theory was 'cause at- at this- by the time this Time Magazine article ran they had a justification for why they thought, even those studies weren't bearing it out, why they thought taking mega doses of vitamin C, A, E, whatever, would actually make you healthier.

Justin:
Why is that?

Sydnee:
So, you've heard of antioxidants?

Justin:
Right.

Sydnee:
The general idea, I think, from a layperson standpoint, is that oxidation in your body is bad.

Justin:
Right? Agreed.

Sydnee:
Because we want antioxidants. Right?

Justin:
Rust. Right.

Sydnee:
Right. 'Cause you rust inside.

Justin:
'Cause you rust on the inside. 'Cause your action winds down. Got it.

Sydnee:

[laughs] The- The real reason is that oxidation causes free radicals. And if, even if you don't know what free radicals are, you've heard they're bad. Right?

Justin:

That's some of the rust being knocked off and floating around your body, basically.

Sydnee:

Kind of. You could say that. Not- Not rust. But yeah, I like that analogy.

Justin:

Okay.

Sydnee:

So even if you don't know what free radicals are you know they're bad.

Justin:

Mm-hmm [affirmative].

Sydnee:

They kill things. They kill cells. They damage our DNA. So, if vitamins are antioxidants and oxidation is bad, taking more vitamins will stop more oxidation. It will stop damage to ourselves. It will stop damaging DNA. Uh, we will not age as quickly and we will live longer-

Justin:

Sounds right.

Sydnee:

... and be healthier.

Justin:

That sounds exactly right to me.

Sydnee:

Except that we keep doing studies and showing that it isn't.

Justin:

Hmm.

Sydnee:

So, this is when things get really scary. Uh, after everybody goes crazy taking vitamins, we start doing big giant meta-analysis, big studies that look at all studies. Like a meta-analysis is an analysis of other analyses, if that makes sense. Like, we're looking at a ton of different studies all at once.

Justin:

Meta studies.

Sydnee:

So- So now we're looking at, like, hundreds of thousands of patients and the effect of vitamins on them. So we did these huge studies in '94; '96; 2004, 5, 7, 8 and 11. So, these are multiple studies over many years. And they looked at people who took multivitamins, people who took vitamin C, people who took vitamin A, combos of vitamins; all versus people who didn't. And here's the scary thing. Not only did they find that people who take vitamins don't live any longer than people who don't take vitamins, but they found that people who take vitamins are more likely to develop problems like lung cancer, prostate cancer, and heart disease.

Justin:

Nice.

Sydnee:

And that they didn't fare as well when they were battling certain cancers and other conditions.

Justin:

Holy crap.

Sydnee:

So they actually... This got so bad the study that they did in '96, the differences between the two groups, were so drastic that they had to stop the study. Because if you're seei- You know, if you've got a study where you're testing this out... Like if I give group A this drug and group B doesn't, let's see who does better. If group A starts dying like crazy, you kind of have to stop the study.

Justin:

I love that they waited a good eight years to- before they tried it a- absolutely tried it again. All right, it's time to fire this thing back up.

Sydnee:
[laughs]

Justin:
"What happened eight years ago?"

"I don't- I didn't know any of those fools. Let's do it again."

Sydnee:
"They probably did it wrong."

Justin:
"They probably did it wrong."

Sydnee:
"We're better at this."

Justin:
"Vitamins can't hurt you. They're good for you."

Sydnee:
So, an- and that's what I'm saying. Like, they did all these studies that showed that not only are we not seeing, you know, people avoiding cancer and heart disease and living forever with vitamins, but depending on which study you look at you saw worse outcomes. Um, and this has not deterred any research. There are still like 2,000 studies done a year. Or I should say, papers published a year; who knows how many studies are being done. But there are 2,000 published papers a year on vitamin C. That's- If you look at that in American research dollars, that's probably around $60 million.

Justin:
Ho- Holy crap.

Sydnee:
So, nobody found any evidence that vitamins are doing any better, um, but that obviously has not- not stopped the vitamin train.

Justin:
And what happened with Pauling?

Sydnee:

Well, Linus Pauling died of prostate cancer in 1994.

Justin:

Um, well, that is very unfortunate. I'm sorry to hear that Linus, but thank you for all-

Sydnee:

Brilliant scientist. I mean, really. Super, super cool guy. Obviously did many, many great things and to be fair he should be remembered for all those other things.

Justin:

Let's focus on those folks.

Sydnee:

And not the vitamin C so much. But I think that it really did strike, uh, what I would say is, I would say is, like, an epidemic in this country of vitamin usage.

Justin:

That's like me, I prefer to think of Jenny McCarthy from her work on *Singled Out*.

Sydnee:

[laughs]

Justin:

You know, I'm- I'm a glasses half full kind of guy. Uh, uh...

Sydnee:

But th- this is a thing...

Justin:

Okay. So I need to ask you.

Sydnee:

Uh-huh?

Justin:

What vitamins should people take?

Sydnee:
Are they...

Justin:
Apparently, if you take some, you don't get scurvy. If you take one more than you need, you die of cancer.

Sydnee:
Here's the thing-

Justin:
Vitamins.

Sydnee:
... here's the thing to remember about vitamins.

Justin:
Okay.

Sydnee:
Okay. First of all, this does not apply to pregnant women. If you are pregnant, you should take a prenatal vitamin. We have good evidence that shows in pregnancy taking, specifically, folic acid; but all of the things you get in a prenatal vitamin are a good idea. So, this does not apply to pregnant women. Everybody else, especially if you live in the US or in another developed country, your diet almost certainly contains all the vitamins you need. Unless you don't eat or you have a very strict diet, you know...

So this- Like, some, um, very strict vegans might be in danger of not getting certain vitamins, if they don't pay attention to what they're eating. Um, but for the most part, if you don't limit certain parts of your diet, you're just getting all the vitamins you need. It's almost- It's almost hard not to. If you ever wanna know, just take a look at the back of, like, even processed foods like chips and stuff and you'll see that there are vitamins in those that you didn't even know you were getting. Uh, more than likely you don't need any vitamins.

Justin:
You see this, uh, uh, so much-

Sydnee:
Supplements, I mean. Any vitamin supplements.

Justin:

... you see this so much that you almost get, you know, you almost get an air to it, but, like, you look at your cereal and, like, they literally- it says fortified with vitamins. Like they spray cereal with vitamins. Like...

Sydnee:

Yes. There are tons of vitamins in your food. A normal balanced diet should supply you with... 'Cause remember, one of the definitions of a vitamin is that you only need it in trace amounts. So, a normal diet should provide you with all the vitamins you need. Now, I will say that vitamin D is a really hot research area right now. Um, and this is probably related to the fact that in order for vitamin D to be active in your body you have to be exposed to sunlight.

Justin:

Hmm.

Sydnee:

And I don't know, maybe it's just evolutionarily, we are not spending a lot of time in the sun now. Um, especially, you know, we wear a lot more sunscreen and we try not to go out as much for the fear of skin cancer, which is something we should not ignore. Um, but as a result, we are finding that some people are vitamin D deficient as adults that we didn't know previously. But again, unless your doctor tells you you're deficient in a vitamin, and we can check for the ones that we're worried about, unless we tell you that you're deficient, you don't need to be taking a multivitamin.

Justin:

So there you have it straight from the Sydster’s mouth.

Sydnee:

Oh, and a B12 shot will not give you energy. It will not. Unless you are deficient in B12. So don't ask your doctor for a B12 shot. I get asked that all the time.

Justin:

Specifically, if your doctor is Sydnee, please don't ask her for a B12 shot.

Sydnee:

No. Unless you're deficient it will not help.

Justin:

Thank you so much for listening to our show, *Sawbones*. We wanna tell you about something pretty exciting. We're doing a, uh, a live show in Huntington, West Virginia, our hometown, where we live, with *My Brother, My Brother and Me*, the advice show that I do with my brothers, uh, on December 21st at 7:00 PM. Uh, it's gonna be a hoot and a half, I think. It's called *My Brother, My Brother and Me: Home for the Candlenights Holidays Spectacular, live from Huntington, West Virginia with Sawbones*, or featuring *Sawbones*, one of the two. Which would you prefer? You wanna be with or featuring?

Sydnee:

Um, I think with. Featuring sounds like more pressure.

Justin:

It's a lot of pressure. Uh, we're gonna be doing that at Huntington City Hall, uh, we'll be hanging out afterwards. And, uh, I have a whole list of fun activities to do, uh, in Huntington that you can find on the *My Brother, My Brother and Me* group. And I'll put it on *Sawbones* group, too, if you want. But, uh, we think it's gonna be a lot of fun. Tickets are going fast. Uh, we sold like around 150 today when they went on sale. Uh, so we're- we're- they're- they're going fast. You should get 'em and come to the show. It's gonna be great. You can go to mbmbamcandlenights.brownpapertickets.com and that will be, uh, where you can get tickets to, uh, to the show. And, uh, they're 15 bucks. So come on out.

Sydnee:

And check out... I think you posted this and maybe Travis did, too. There are a lot of cities that are surprisingly close to Huntington, West Virginia.

Justin:

Yeah. Lexington's two hours away. Louisville, Cincinnati, Columbus, you're all three hours away.

Sydnee:

Uh, if you go out to four hours I think we hit, like, Pittsburgh-

Justin:

Mm-hmm [affirmative].

Sydnee:

... and Indianapolis and...

Justin:

Yeah. I've driven to a- a lot of those places to see concerts before. I've driven to DC to see concerts before

Sydnee:

It's only five hours, I think.

Justin:

What, DC?

Sydnee:

DC.

Justin:

About six or seven.

Sydnee:

Okay. Well, you know, close. Yeah.

Justin:

But, uh...

Sydnee:

We're worth it!

Justin:

That- That address again is mbmbamcandlenights.brownpapertickets.com. So go get 'em and come hang out. It'll be fun.

Sydnee:

Yeah. Chuck's already got her ticket.

Justin:

Yep. Uh, anyway, that's- uh... We're- We're on the Maximum Fun Network with *My Brother, My Brother and Me*. And a lot of other great shows like *Destination DIY, Baby Geniuses, Stop Podcasting Yourself, Bullseye, One Bad Mother*...

Sydnee:

My Brother, My Brother and Me.

Justin:
I said th- Well, I mean, I said that at the beginning.

Sydnee:
You already said that?

Justin:
I said it, like, at the beginning, but I appreciate the double plug though.

Sydnee:
I'm always supposed to.

Justin:
I know I- I took that-

Sydnee:
It's my thing.

Justin:
It's your right.

Sydnee:
It's my patter.

Justin:
It's your- [laughs]

Sydnee:
[laughs] Don't...

Justin:
Uh, they're all at maximumfun.org. So, go listen to some of those shows. Thank you to the Taxpayers for, uh, the use of their song *Medicines* as our opener and our closer, and that's gonna do it for us. Uh, until next time, 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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