

Announcer: Bulletproof Radio, a station of high performance.

Dave: You're listening to Bulletproof Radio with Dave Asprey.

Dave: Today's cool fact of the day is that there's an interesting way to cook rice to dramatically cut the amount of calories and carbohydrates in it. A guy named Sudhair James, an undergrad student at the College of Chemical Sciences in Sri Lanka, and his mentor discovered that you could cut the number of calories by 50% by cooking rice this way. What you do is you take rice the way you'd normally cook it, but you add coconut oil about 3% of the weight of the rice before you boil the rice. Then, you refrigerate it for 12 hours afterwards.

Dave: What this does is this makes a resistant starch that feeds your gut bacteria better and doesn't raise your blood sugar levels. What I do is I do that with brain octane because I don't like coconut flavor in my rice, and I find I get a similar effect from it, and even if you don't cool the rice right away, you're probably still getting some benefit, but the idea of eating cooked and cooled rice is actually a great way to make branched-chain carbs that feed gut bacteria, but that don't feed you. When your gut bacteria eat these branched-chain prebiotic types of fiber, they actually make short-chain fatty acids, which really does put your body into fat-burning mode, which is cool. Things like butyric acid that you read about in Headstrong and in the Bulletproof Diet.

Dave: As we're getting into the show, I'm going to interview someone who has been a guest on the show before, and as a result of that, is featured in the book Game Changers, which you must buy now if you haven't bought it yet, and the reason for that is that if you enjoy the show, I've gone through and analyzed almost 500 of these conversations with a statistician to find out what do people who change the game not just for themselves, but for the world around them, what do they actually do?

Dave: The guy is coming back on the show for his third time actually. He's a very well-known cardiologist who goes by the name of Dr. William Davis, and you know about him because you've probably read or at least heard about his famous book, Wheat Belly. Dr. Davis, welcome to the show.

William: Thanks for having me back, Dave.

Dave: I included you in Game Changers because you were one of the very first guys as a board-certified cardiologist to come out there, and just go, and fly in the face of traditional wisdom and say, "Actually, this gluten thing matters. It matters greatly." As a result of that, you took a lot of hits. People said, "That can't be so ... It's not possible," and you got all the grumblings from the National Grain Marketing Association and people like that. Sometimes, they go under the guise of a school of medicine or regulatory agency, but that's my perception of reality maybe around.

Dave: I wanted to pick your brain. We could talk about the latest things you're doing on fixing healthcare, which was the second reason you came on was to talk about how to manage

your own healthcare. We'll get into that in a little bit, but I want to know how you dealt with the first wave of criticism when you came out with Wheat Belly.

William: You know, Dave, it was easy because I went through a long period of skepticism. I have seen what happened to people when you remove grains and took some additional handful of steps to restore health. It was astounding, and I couldn't believe, so I thought about this for a long time, did a lot of thinking, talked to some agricultural scientists, trying to understand what the hell was going on that when you take the food that was blessed by all official authorities, you witness dramatic turnarounds in health, weight, need for prescription medication, et cetera.

William: So, I kept on expecting to be ... to find out I would say, "Ugh, it was my mistake," but as I dug deeper, it became clearer and clearer that conventional dietary advice was not just ineffective. It was catastrophically and tragically wrong, and so I knew I was right. When you see people get off 11 medications, when you see people get rid of 20 years of rheumatoid arthritis, when you see people get rid of ulcerative colitis, and Crohn's disease, and diabetics on 10 years of insulin and other injections, and become non-diabetic, you prove over, and over, and over that there was something really powerful about this lifestyle, so the criticism is there. You know what I do though? When someone would piss me off, I would go on the Amazon page for 50 Shades of Gray.

Dave: Yeah.

William: I never read the book, more so the movie, but I knew what it was about, and here, this woman, of course, had a huge success, but read the criticism. "This horrible book must have been written by a horny 14-year-old." In other words, she got the most vicious criticism, but you know what? She won. In the end, she won, so I found that very comforting that you can be right in something. Maybe a bad analogy, but you could be right in something, but people who stand to lose money or just credibility, or have their careers decimated, if a faculty member at a university built their careers on 30, 40 years of advocating healthy whole grains and some schmuck Milwaukee says, "No, that's all wrong in fact," you've lost all credibility. You damage their careers, and so I understand that people had been harmed by this message, but the bigger message here is that many, many, many millions of people have hugely benefited from it.

Dave: Okay, so you keep your eye on this idea that you've seen sick people who you couldn't cure using the standard of care the way it used to be, and you've seen enough of them, so that is so much greater than the value of the criticism that just having the mission was probably the biggest thing that I teased out of that?

William: Yeah. I'm not selling people fancy programs. I'm just telling, "Just try this."

Dave: Right.

William: They get off their medications. They are freed of chronic pain, and sometimes, 10, 20, 30, 40 years of suffering with joint pain, headaches, depression, suicidal thoughts that

are dramatically ... Not to say every disease known to humans reverses. Just most of them.

Dave: It's been my experience, and one of the reasons that I wake up excited every morning is the same thing. I went through all that stuff and did the work, and something magic happens when you do the stuff that I recommend, the stuff that you recommend, and I look at all the 30 or so years that I was just sickened by bad advice, and really, I feel a moral obligation to tell the truth about it. If someone says that it didn't happen because it can happen, like that's the anti-science here. You just ignored the evidence because you didn't like it, and I find that that behavior happens in medical schools. It happens online. It happens in corporate board rooms and all that. You've dealt with that a lot. You do a patient compliance when you're dealing with the patient where people ... They just don't want to see reality. What have you learned about getting people to see reality?

William: People like to see the successes of other people. You and I can talk till we're blue about the science, and some people do, but I know you're a guy who likes to hear about the science, but most people ... Oddly, about 87% of my audience is female, and they ...

Dave: It certainly looks, right, Will?

William: Yeah, it must be that, Dave. Yeah. You can mention the science to reassure them that there's a real logic and rationale behind all this and scientific evidence too, of course, but most people just want to know if they can fit back into a size four dress, if they can attend their daughter's wedding in a nice form-fitting gown, and that's what people really want, and so ...

Dave: Isn't that called Spanx, and then you're done?

William: That's right. That's what's driven a lot of this. It's not my charisma and good looks. I can assure you. It's the fact that people witness each other's extraordinary successes, and these are not just weight loss successes, I should know. It's also change in appearance. It's complete dramatic turnarounds in health, and that's the part I find the most exciting. I can't show people that ulcerative colitis is now gone and they're off three medications, including a very costly biological drug, but I can show them the change in facial appearance. I can show them the reversal of cellulite in legs. I can show them that someone's waist has been reduced by a foot, a foot in circumference. So, we can show that sort of thing, but we can't really show them that this person doesn't need insulin and three oral drugs for diabetes and hypertension anymore. The successes are what drive this message.

Dave: It is the successes that motivate me, and I'm asking on behalf of listeners here who may not be in a position as a cardiologist who has years of practice, and all the experience, and 4 million books sold, and all, so all of them are working on stuff, and they're all dealing with this. I'm trying to do something good here, and I've got all these naysayers, and people say it's not possible or my mom is telling me that I have to eat gluten because I'll starve otherwise. Is there some mindset that's more personal than the

mission-driven one that's motivating you and me? Something you've heard from a patient or some sort of a mindset trick that really helps people just rise above all the stuff that's holding them down when they're looking to reset their health.

William: I think, for me, it's also a mission of trying to set things right. When you see some ... If you see a man beating his wife, you want to step in and try to do something about it.

Dave: Yeah.

William: Maybe you don't ... Maybe achieve them, maybe you don't, but you want to at least have the impulse to try. If you see somebody caught in a burning car, you have the impulse, "I should run over and pull that person out of the car," and that's what I see happening here. So, like your experience, Dave, 30 years or struggling with health, it wasn't because you were broke and didn't have access to healthcare. You were struggling despite the bundling of healthcare, and that's what I see happening that people say, "I've been to eight doctors. None of them know what ... but they're happy to dispense prescriptions for Lipitor to Toujeo, Enbrel, Humira, and I now spend \$1,800 a month," and that's what's happening in the US as you know. The prices are escalating faster than ever, so a drug like Humira, which is commonly prescribed as an anti-inflammatory is now priced at \$4,800 per month.

Dave: Wow.

William: The drugs for hepatitis C like Harvoni start at \$84,000 per vile, 120 tablets. This is what's happening. The prices are going faster and faster, and the doctors are the willing accomplices in this massive predatory exploitative industry called healthcare, and big pharma, and the medical device industry. The truth of it is we could cut healthcare down to a tiny fraction of what it now does if people just got the message of health.

William: For the most part, people don't need their doctors to muck up their health. In fact, the kind of health you and I achieve by our programs is not just on a par with what you get the medical system or almost as good as. It is dramatically superior. The health we achieve is superior to the impaired health, the propped up artificial health you get from the doctor's office and the healthcare system. Taking Lipitor for cholesterol and thiazide diuretic for blood pressure and anti-inflammatory drug for joint pain, that's not real health. That's the appearance of health as perceived by a predatory, profit-seeking, exploitative thing called healthcare.

Dave: I can see why you wrote Undoctored, the subject of our second interview, because you're passionate about this too, and I look at the three knee surgeries I had. In fact, I was diagnosed with arthritis when I was 14, and no one knows why like, "Oh, it just happens." Like, "What do you mean it just happens?" I carried a lot of bitterness and anger about that until I did all my neurofeedback in ...

William: Rightly so, Dave.

Dave: Yeah.

William: We should be angry at the healthcare system. I agree.

Dave: Yeah. At this point, the anger just makes it stronger, and I'm to the point where I am dismissive of it and very happy to break it. In fact, I get great joy from that, but I'm doing it from a place of anger. It's more a place of amusement because I know it must happen, and you might as well enjoy putting a stick in the spokes of a big system that is crumbling under some weight, and the way you do that is just simply knowledge.

Dave: When someone reads Wheat Belly, when someone cuts junk out of their diet, and they look different, and then their friend says, "What did you do?" Like you can't stop that and social media made it a lot easier to do that, so I look at the 20-year outlook for the companies selling this kind of junk, it is not good, and I'm here to make some stuff that's worth eating because I need to feed my kids and I want to feed myself, and so we're there, but you talked about how you become smarter than your doctor in your book, and this is actually why you're also in law 33 in Game Changers, and this is a law that says that you want to track what you're going to hack, and I talked about how I've changed my life.

Dave: A lot of the Bulletproof techniques around ... Almost every blog you'll see about how to hack your sleep, they're just carbon copies of copies of copies of the original How to Hack Your Sleep blogs that I wrote in the early days of the Bulletproof blog, and this came about from looking at EEG data every morning. "Oh, there's a study. Let me just test this and see like ... Oh, this works."

Dave: So, sleep mattered, but I want to get your opinion as a cardiologist on ... If people wanted to hack their health the way you talk about, what are the big lab test things they can do at home, but specific data gathering things that we should all be looking for in order to get the best possible perspective on what we're doing and also, just to be cost-effective about it? I spent ... I don't know how many zeros, but because I'm a professional who can pick, I probably spend, I don't know, tens of thousands of dollars on lab tests all the time because I'm trying new lab tests because I want to see whether this worked, and I'm trying to live to 180.

Dave: So, I'm not normal, but I want your doctor's advice. What matters most? You need this dataset. I'm guessing it's not LDL cholesterol even though you're a cardiologist, so give me your list of like most important stuff to track so that people listening can have the most control over the amount of energy they have and how they feel.

William: I'll bet most of your audience already recognizes, Dave, that the whole cholesterol statin thing is a crock [inaudible 00:15:50] a bunch of crap. That is it's very profitable. It came from misinterpretations just like the "cut your fat, cut your cholesterol" conversation. Diet is proven to be completely nonsense. There never was science that supported that. It was misinterpretations of science, but the real tragedy of a statin and "cut your fat" conversation is that the real causes of heart disease aren't talked about, and that's why there's more than ever angioplasties, heart attacks, bypass operations.

William: You know what? It's very profitable to be stupid. That is very profitable for my colleagues to turn a blind eye to the real causes of heart disease. That's why hospitals can afford to add on \$80 million new wings. That's why my colleagues make seven-figure incomes by doing procedures because it's very profitable to be ignorant and continue the status quo, which is a procedure for every problem, a drug for every problem, but if you really want to ... So, a lot of the things I do actually got their start because I was trying to regress heart disease. I was scanning people with heart ... CT heart scans and seeing people freak out on me because heart disease progresses at the rate of 25% per year. It's horrendous. If you put somebody on a low-fat diet and high-dose statin drug, heart disease progresses at 25% per year. There's no impact at all.

Dave: So, Dean Ornish and you are great friends, right?

William: Oh, well, that's a whole conversation of its own how he misinterpreted his data, and he never did put a stop to heart disease at all. That's ridiculous. He used the wrong measure. His patients ... and the Lifestyle Heart Trial had an enormous amount of cardiac events, so this idea that he reversed heart disease is complete nonsense, but anyway. So, this whole program that I call Wheat Belly Total Health or Undoctored really came from efforts to reverse coronary atherosclerosis, the stuff that underlies heart attack, heart disease, need for bypass and stents, and all that. So, cholesterol testing is nearly useless. It's a lousy marker to begin with. It's imprecise and miserably outdated. It's from 1950's, 1960's technology, but there's much more ...

Dave: I want to pause of a second here. You're listening to this. Dr. Davis is a board-certified cardiologist and he just said all that. Like let that sink in. This is actually how it works. All right. Keep going. Sorry.

William: So, what we do instead are look at the real cause of the most common causes of coronary disease, and you do that by doing something called advanced lipoprotein analysis like an NMR lipoprotein analysis. You can ask your doctor to draw it, and he'll say, "Oh, I don't know what that is," or, "Insurance won't pay for it." Don't let him pull that bullshit on you because insurance does pay for it, and I've been doing it for over 20 years. It's relatively easy to interpret, but your doctor isn't educated to do this because the sexy sales rep in his waiting room in a miniskirt doesn't teach him about that. All she wants to do is hog her statin drugs, and Repatha, and that kind of stuff. So, NMR lipoprotein panel with lipoprotein A. You have to specify that.

William: Then, the access of testing that gives you basic insight and cure insulin sensitivity or resistance. The situation can lead to diabetes, type two diabetes and pre-diabetes. That involves simple fasting glucose, fasting insulin, and hemoglobin A1C, the long-term measure of blood sugar. Vitamin D is such a huge player, Dave, in reversing cardiovascular risk. Huge. It was the first time I saw heart scan scores reversed, dropped. 900, which is a very high score. Zero is normal. 900, for instance, dropping to 450 or something. Dramatic regression. That only happen when I added vitamin D to achieve a 25 hydroxy vitamin D blood level of 60 to 70 nanograms per milliliter. There are other things you can get, but that's the ... Oh, and thyroid panel. Very, very important.

Dave: Thank you. I was going to ask you about that. Advanced thyroid panel?

William: Yes, so full thyroid panel, TSH, free T3, free T4, reverse T3, and thyroid antibodies give you a full sense of landscape of thyroid dysfunction because so many people ... Conservatively, 20% of the US population has thyroid disease. More accurately, probably 35%.

Dave: Yeah.

William: It's a ton of people.

Dave: [crosstalk 00:20:19].

William: I blame industry and the ignorance of my colleagues and toxicologists because we know that BPA, perfluorooctanoic acid from Teflon residues, triclosan in hand sanitizer and antibacterial soaps, and on, and on, and on. Dozes or hundreds of these things in your toiletries, perfumes, colognes, topical things, all sorts of things disrupt your thyroid, including blocking the conversion of T4 thyroid hormone to the active T3 thyroid hormone, and so we have endocrinologists who even other and occasionally check the thyroid handing out Levothyroxine, which is T4, and people remain hypothyroid despite taking the T4 and say, you know this, "I'm cold. I can't lose weight. I'm losing my hair. I'm constipated. I'm depressed." The endocrinologist says, "Uh, that's not my problem. Take an antidepressant." That all goes away with addressing T3, so yes, and hypothyroidism is a flagrant coronary risk factor.

Dave: Thank you for saying that. Okay. You might know the stats off the top of your head. If someone is low on thyroid, what percent does that increase their risk of all cardiac events? Do you have a ballpark number?

William: There's a lot of debate about that. It depends on the severity of the hypothyroidism, so there's a lot of active debate about how much ... how hypothyroid you have to be in order to contribute. I will tell you my experience though. I did this to many thousands of people. Let's say somebody has a heart scan score of 700, which is a very high score, and then we put them through the program. All the things we have talked about, grain elimination, sugar limitation, vitamin D restoration, et cetera. Next score is 480, regression. Another two to three years later, score is 380, further regression. Another two or three years, score is 900.

Dave: Oh, wow.

William: So, we look. What's wrong? We find it, hypothyroidism, so that can rear its head, and it will act as a flagrant cause for cardiovascular events, but there is no question that hypothyroidism does cause heart disease. Actually, in many forms, not just heart attacks. It can also cause heart failure and other forms of heart disease, so thyroid is very important, and unfortunately, it's a byproduct. Hypothyroidism is a byproduct of industrial compounds, this sea we're swimming in of industrial compounds.

Dave: Is there a case for people over 50 or something to ... Maybe just [prophylac 00:22:50]. we take a grain ... or sorry, not a grain, an eighth of a grain or a quarter grain of thyroidism anti-aging hormones so they can feel really good when they're old?

William: I think that's not that unreasonable. That was actually a very popular notion several decades ago.

Dave: I think it was right.

William: I think there may be ... What I don't know is if you and I had grown up in the wild and weren't expose to all those things, well, that really would be a benefit, but of course, none of us have done that. We're not the Hadza. We don't dig into dirt and spear animals, so I wonder if this is simply a spin-off of modern life, but a very tiny ... I think that would be rational. The endocrinologist would throw a fit because they have this peculiar attitude that you have to be on death's doorstep before you deserve thyroid replacement. It's a very odd attitude.

Dave: I'm sure those endocrinologists who are highly enlightened who are listening to this right now and I ...

William: There might be one or two.

Dave: I apologize in advance for this comment, but every time in my own health history, and as I was learning how stuff really works, any time someone says, "Oh, I've got a problem with my hormones, so I'm going to go see an endocrinologist," they've never once had anything beneficial happen unless they had an active cancer that was producing it in which case, but other than that, they would just get the opposite of useful advice, so why do most mainstream endocrinologists hate human beings, Dr. Davis?

William: Dave, your experiences precisely reflects mine. I have heard of one or two endocrinologists who are actually open-mind, and functional, integrative, and thinkers, but I say easily 99%. I don't know why. I don't know what's the nature of their personalities or training that make them so incredibly dense and ignorant. I don't know what, so I actually discourage people from seeing endocrinologists because as you point out, they come away with their brow beaten. They're insulted and given astounding misinformation.

Dave: That is unfortunately like my experience, which is smaller than yours, and so if you go to someone who studies functional medicine or anti-aging medicine, you typically find someone who looks at bioidentical hormones as tools to be optimized as an operating system versus this brute force club approach. Essentially, I'm happy we got to talk about thyroid and aging because I know this is an ancient anti-aging thing, but the more I hear from people who say, "I don't quite have the energy I had." They take a tiny dose of thyroid even without a test. At that low dose, it's not going to cause a problem, and if it's too much, they'll be sweaty, and they won't like it, and they'll stop. These main things you talked about aren't expensive except the heart scan test, NMR, the advance lipoprotein analysis, that runs what? About 1,500 bucks out of pocket?

William: Now, it's something like \$80 or \$90 so it's more than ...

Dave: Oh, it's that cheap? Okay.

William: Yeah. It's more than a cholesterol test, which can vary with like \$15, but it's really not that bad. The insight you gain from it is priceless, but the insight you gain with proper interpretation virtually always points to dietary solutions, so you can imagine why Merck and Pfizer, and AstraZeneca don't advocate this much more confident testing called lipoprotein testing because it makes it immediately obvious that the solution is not a drug. It's a shift in diet, and by the way, the kinds of results you obtain in the true test lipoprotein testing with nutritional methods is dramatically superior than the kinds of results you obtain using drugs.

William: Thereby, you obtain far better reduction of cardiovascular risks using nutritional methods, but the problem is, of course, the cardiologists, the primary care doctor, government agencies say that you should cut your fat and cholesterol, and your saturated fat, eat more healthy, whole grains, which if you watch this from a lipoprotein standpoint, you will see a dramatic deterioration in the patterns that lead to heart disease, diabetes, obesity, et cetera. In other words, government advice and conventional dietary advice actually cause heart disease, and dementia, and cancer, and hypertension, and diabetes.

Dave: Yeah. That is the way I see the world as well. I noticed that you didn't have anything in there around Lp-PLA2. Can you explain what that is? Then, I want to tell listeners why I'm interested in that, but can you document that as a cardiologist what you take on it is?

William: I'm not sure what to make of it because so much of the data surrounding phospholipase A2 has been generated by the drug industry, and we know that the drug industry paved its own path for profit, so I was trying to understand this data that is ... I'm always hesitant when the part of solution is always a drug.

Dave: Yeah.

William: So, in other words, it's like LDL cholesterol is perfectly crafted for drug treatment even though the real treatment has nothing to do with the drug. Likewise here. Every study agreed that people who have higher levels of this inflammatory mediator called phospholipase A2 have increased cardiovascular risk, and that risk is reduced by statin drugs. Well, that doesn't make any sense to me, so I actually called the world's leading researcher, and I asked them, "Can you explain something to me? Why aren't we looking at such things as some kind of natural manipulation of phospholipid metabolism or some other natural means to impair the excess cardiovascular from this rather than just, as you say, brute force, knock-it-down-with-a-hammer effect of statin drugs?"

William: He had no idea what I was ... He thought I was from Mars. He was very gracious, very nice, but in other words, he's the carpenter with the hammer. Everything looks like a nail, and so I don't till this day really know what the full answer is, but I will tell you with

the collection of things we do that is elimination of grains, net carb reduction, fish oil, vitamin D, et cetera, compilation of bowel flora. We see phospholipase A2 go down in most people. I don't know which of those components is responsible for it, Dave, and I don't know if it's an inadvertent shift, phospholipid metabolism, or phospholipid intake, or something like that. I don't have a full answer for you, but I am convinced the solution is not more statin drug.

Dave: I am 100% with you on the statins because they damage mitochondrial function. The reason I'm interested in this is it's an enzyme that goes up if there's damage to the lining of your arteries essentially, so when people hear, "Oh, my cholesterol is 210. My doctor wants to put me on statins. Oh, and my HDL is 87." By the way, HDL is protective ... like the good cholesterol. If your cholesterol is 210 and your HDL is 87, you're probably going to live longer than the average person, but they'll still ... They freak out and say, "Well, okay. If you believe this cholesterol myth, then your Lp-PLA2 should be up."

Dave: What do you know? When you go for that more expensive test, you don't see the damage that would be present if there was something going on in your arteries. Therefore, the cholesterol is not causing the damage, so it allows people to close the loop, but the other two that I thought you might say would be C-reactive protein and homocysteine. These markers of inflammation that seemed to be behind almost every one of the chronic diseases, including cardiovascular events, do you add those to your list later on, or are they just more expensive? Why didn't they hit your top five or six?

William: With C-reactive protein, you know that this was trumped up by industry to become another statin drug, so the JUPITER trial, for instance, that looked at a high-dose Crestor in people who had low cholesterol, but high C-reactive protein as a presumptive increased marker for cardiovascular risk, and there was an apparent reduction in cardiovascular events on Crestor. Well, first of all, the study was paid for by the manufacturer, and the test yielded revenues for the guy who patented the C-reactive protein. In other words, there's layers of predatory type of revenue generation.

William: Two, the results, even if we believed them, were wildly exaggerated. There's a very minimal reduction of real cardiovascular events, but the statistical manipulation, they exaggerated them, and I'll tell you what my experience was, and that is if someone starts with high C-reactive protein say of 3 milligrams per deciliter, or 4, or 2.5, which is presumptively increase cardiovascular risk, it goes to zero almost always with no grains, no sugars will show up on the ... In other words, it's saying ... I sound like a broken record. I know, but it drops to zero for every single time.

Dave: Exactly. It's not that hard, and it's controllable, right?

William: Mm-hmm (affirmative).

Dave: I look at those for people. If they're not losing weight, if they don't see the benefits when they go Bulletproof or even just eliminate grains, if they don't up their fats, the weight, then I would recommend it. Then, it's, "Okay. You've got some inflammation, and if so, you look for latent infections, and it will show up in these numbers." But if

things are working, they probably don't need to, and what I like about your list here ... fasting glucose. That is very simple to get. You can sure buy your own glucose meter to get that.

William: Mm-hmm (affirmative).

Dave: I started doing that. Just my first glucose meter ... 1996. The doctor told me maybe I should try to lose weight, and he said, "Maybe your blood sugar is high," and so I got this. So, I went into the drugstore, and it was 150 bucks and not 10 bucks back then, and I just pricked my fingers all the time, and I said, "I don't know. My blood sugar doesn't seem that high. This is my graph." He just looked at me like I was an alien, and now, I've actually went implantable glucose meter on Dr. Oz, and he's like, "Dave, what is that thing on your arm?" I'm like, "I didn't want to pull it out because it stays in there for two weeks." He said, "It looks weird on camera," because it was an interview about implantable glucose monitors. It was just like my robot arm for the day, but there's a \$10 test, and you can do it as many times as you want by sticking your finger. Okay?

William: Mm-hmm (affirmative).

Dave: Insulin. This is also a vanishingly cheap test. You get a fat ... What? 12-hour fasting insulin? What do you want it to be?

William: As close to zero as possible, assuming not higher than three or four, which is not what conventional advice tells us. Most doctors don't even check the fasting insulin, but you want ... so high. So, it's very common for Americans, Canadians to have fasting insulins of 30, 40, 50 units, and it's sky high because they're resistant of the insulin. Their bodies, their muscle, and their liver are resistant to insulin, so the pancreas overcompensate by producing huge amounts of insulin, which of course, is a very effective weight gain drug and amplifies inflammation, so getting your insulin down to near zero means you're not insulin-resistant. You're responsive, and it doesn't get in your way of trying to lose weight.

Dave: It's amazing how people who are in ketosis for long periods of time also get insulin-resistant. It's one of the reasons ... Like if you're in ketosis, great cycle. Go in and out, in and out. Be able to metabolize carbohydrates. Be able to metabolize fats, and this sort of ... the keto bro, "My ketones are higher than yours." It feels to me like someone is saying, "My blood sugar is higher than yours," because you should be metabolizing this for fuel. What's your take on long-term ketosis versus cycling ketosis as a cardiologist?

William: I'm thrilled that you brought that up, Dave, because ... So, you and I know that ketosis is a physiologic natural process.

Dave: Mm-hmm (affirmative).

William: It's a protective mechanism for periods of deprivation, starvation, lack of carbohydrate, but I view it like the stress response.

Dave: Yeah.

William: Temporary stress is an adaptive response. Long-term unrelenting stress is very bad. At least, the cancer, dementia, and heart disease. Same thing here. Intermittent brief periods, meaning days to weeks of ketosis is natural, and it's a great tool for losing weight, reversing fatty liver, accelerating reversal of type two diabetes, but when you follow ... As you know, we have tons of data in kids who are put on ketogenic diets for pro-longed periods because it suppresses intractable seizures, and it works, but what happens to these kids?

William: They stop growing. They have huge increase in kidney stones, osteoporosis. There's an occasional cardiomyopathy, or heart muscle impairment, or heart failure, sudden cardiac death. They develop dysbiosis and small intestinal bacteria overgrowth. They get constipated, and their risk for diverticular disease and long-term potential for colon cancer increases. In other words ...So, ketosis is wonderful, and natural, and physiologic for the short-term and intermittently, but not for long-term use.

William: Now, I worry about that a lot because the ketogenic people go berserk. They think I'm just bashing their lifestyle. I'm just trying to educate them, and I fear about some of these commercial operations where they're trying to introduce long-term ketosis. What I fear, Dave, is let's say two years in to a ketogenic diet, somebody develops either diverticular disease or colon cancer, and then critics will say, "Look at that. We told you. All those diet fads. You're stupid." With a broad stroke, they'll condemn all the non-conventional diets. I fear that could happen, so that's why I'm trying to tell people as you are that ketosis is fine. Just don't do it all the time.

Dave: I like that perspective, and I have concerns over like high levels. I like to have a little bit of ketones present all the time, and some days, I fast. Some days, I don't. Some days, I'm eating keto diet. Some days, I'm not, but the deal is the body can do it, and I feel like base on my lab data that that is the right approach because of the way it handles the inflammation and things like that.

Dave: I know that you're very much data-driven, which is why in Game Changers, you're in the rule about track what you hack, and I noticed you didn't put ketones on here because most people aren't ever going to be in ketosis in the normal population. If a Bulletproof Radio listener who has tried ketosis or maybe uses brain octane to get ketones introduced into their diet even if they eat some rice every now and then, would you put ketosis, having a ketone meter as one of the things that's important or not really?

William: Yeah, I think it's useful. Let's say someone who's a type two diabetic and really wants to become non-diabetic in short order or someone with fatty liver wants ... undo that process as fast as possible, or you got a lot of weight to lose. You might go as fast. I think it's very reasonable to do fingers to ketones or breath ketones.

Dave: Yeah.

William: I think that's reasonable, or if you have performance interests and you want to supplement, say, MCT or beta-hydroxybutyrate ketones. It's a supplement in [Dutches 00:37:40] production, I think that's reasonable, and try to keep your level above one millimole or something like that. I think that's very reasonable.

Dave: I like to keep mine above 0.4 because that's what turns off hunger hormones. Anything beyond that is gravy, and I'm not a fat of the ketone salts for some weird [inaudible 00:38:02] reasons.

William: Good point. Good point, Dave. Yeah. I actually contacted the FDA because one of the manufacturers, if you use their preparation twice a day for two weeks, it would be fatal. Yeah, yeah.

Dave: There's a lot of crazy stuff. I had a ketone ...

William: A lot of crazy stuff.

Dave: I had a ketone salt formula that wouldn't have that problem formulated and ready to go. Labels created, FDA stuff all done, and I actually pulled the product before I shipped it because I became aware of new research on the mirror image ketones that are not bioidentical and what those do, and I said, "All right. I'm in the stick with brain octane for that." It was an inexpensive business decision, but it felt like the right move, and so I definitely have concerns there. We'll put it that way. So, next one on your list. So, we had the heart scan and glucose fasting levels. Insulin. You had another one, which was a marker for basically long-term blood sugar stability. What was that marker?

William: Hemoglobin A1C, which is interesting, Dave, for a variety of reasons. So, it's an index of long-term blood sugar fluctuations. So, the average in the US and Canada is in the pre-diabetic range now, and my colleagues often tell some ... Let's say you have a hemoglobin A1C of 5.7%, which is pre-diabetic. 6.5% higher is type two diabetes, the official cutoff. Ideal is 5.0 or less. Most of us fall in these lifestyles or in the four range, 4.3, 4.5. Something like that.

William: People aren't often told that if your hemoglobin A1C, say, is 5.7%, most ... As you know, most doctors, my colleagues say, "Dave, you're fine." What they're really telling you, "Dave, you don't need insulin or drugs yet for your blood sugar. Don't waste my time." What they're not saying is that you're safe because we know that the risk of death from heart disease, for instance, at that level is about 250% to 300% higher than the average person.

William: In other words, you're walking around with a target on your back that you could easily reverse within weeks easily, and the doctor pats you on the back and says, "it's okay, Dave. You don't need Metformin, Toujeo, or NPH insulin yet, so just carry on. Continue to cut your fat and eat the foods that raise your hemoglobin A1C higher." This is the status quo in conventional healthcare.

William: I think that's what drives you and me, and people like you and me is that there's so much wrong. When you set profit first, you do some really awful things to people, and when you make health and truth the thing you want to achieve, all of a sudden, it's like shining a light in the a dark room. You start to see all the things in there.

Dave: It's something that really changed, changed my life, and it also made me feel like I just have more control, and I did go through this phase, "Oh, look. You get all this data." This was 10-plus years ago, and you realize that you can get way more data than you're ever going to do anything about. At that point, you're like a coin collector or a stamp collector. If it makes you happy to have binders of stamps on a shelf, that's good, but they don't actually do anything. Right?

Dave: So, if you're a data fetishist like some of my Quantified Self good friends, I would encourage you to follow your passion, which by the way is also another rule in Game Changers. But for the rest of us, it's like just give me the numbers I need that aren't going to cost me a lot of money and things that will change if I do what I think is going to work, and you just nail that in a really clear thing, and the budget ... Oh, I think that getting hemoglobin A1C is relatively expensive. I didn't ask you the price on that. That's ...

William: It shouldn't be more than ... I couldn't quote an exact price, but it's less than \$100.

Dave: Okay.

William: You can even buy your own home device to measure it.

Dave: Got it, and a vitamin D test is around 50 bucks, and then the advanced thyroid panel is still around 200 bucks.

William: Yeah, yeah.

Dave: All right.

William: There are labs ... As more direct consumer lab tests and testing services are being offered, we're seeing a ratcheting down of costs. There's not a whole lot of bargains yet, but I'm seeing some improvement there.

Dave: It makes me so happy. I've always been terribly offended at the idea that I need a permission slip to get data about my own body.

William: Yeah.

Dave: It's unacceptable. If you're listening to this and you're saying, "Well, bio-hacking or living to 180, it's a game for rich people," look, cellphones were for rich people too. They are not for rich people anymore. They're for all of us. Everything we're talking about here by pushing boundaries, it's how it becomes affordable, so if you find yourself playing that story in your head, just All right. Tell your doctor you want this. Tell your insurance

company that you're pissed off at them not paying for it and that you don't want to pay your premiums if they don't.

Dave: Magically, it will become much more affordable over the next number of years, but even so, we're talking ... I'm going to call it 100 bucks for your heart scan. I mean, for the insulin and glucose, we're going to just call in 25 bucks a piece. 150 bucks. 100 bucks for A1C. We're at \$350. \$50 for vitamin D. We're at \$400, and advanced thyroid is 200 bucks, so we're talking \$600 max, and you might be able to get this all in for \$400.

Dave: It's going to give you a very substantial picture of, are you going to die from a heart attack? If you don't like the numbers and if you eat a normal diet like, "Oh, I just occasionally have my soda and just occasionally eat meat from industrial animals," and just on weekends is when you eat your loaf of white bread on your cheat day, you won't like your numbers, and then you can do something about it, and you can test them again at six months.

Dave: This is what people spend on lots of other things. In fact, there are people who spend this on, dare I say, coffee over the course of two months. I will encourage you to keep spending that on coffee and more. Just kidding. You guys realize I am the Bulletproof coffee guy, right? But I can tell you that it's not end of the world money, but it is real money. It's just the return on investment for this is just ... It's so high that I highly recommend this, and I would also ... I'd toss in C-reactive protein and homocysteine as well. I find that those are helpful, but if you just go with these, I'd be totally happy with that too.

Dave: All right. Let me pick your brain about a couple other things. You may know for 20 years, I've run an anti-aging nonprofit group, and a lot of the bio-hacking thinking came out of that. Tell me your top three things for people who want to live way longer than Mother Nature wants them to like the things that matter most based on your experience.

William: The wheat and grain elimination is huge.

Dave: Yeah. Yeah.

William: I'm still wild, Dave, to see the effects that come from that and I ... As you know, proving longevity is not an easy thing to do.

Dave: Oh, no. It's theoretical, by the way. You don't have to have a clinical study for all. This is what you would do for your dad or for you.

William: Because it's so difficult to prove longevity, I've settled for second best, which is trying to be as vigorous and youthful for as long as you can. That is if you die at 84, but you are a vigorous 84 jumping on a pogo stick, dancing the samba, hobnobbing with friends, and having fun. That to me is a great success like I can't argue.

Dave: Absolutely, it is.

William: Vitamin D, huge that ... Vitamin D was a world-changing ... a real game-changer for me. Not to say I have all the answers for how to cultivate healthy bowel flora, but I think bowel flora is huge, and it's becoming huger every day. All the efforts we make in ... because I think we're going to see that Parkinson's disease is largely a disease of bowel flora. Fibromyalgia, bowel flora.

Dave: Yeah.

William: Ulcerative colitis, bowel flora. Colon cancer, bowel flora.

Dave: It's all in there. Have you talked with Naveen Jain from Viome. I've been an advisor to the company since they're first founded and just ... I want the data. I wonder what fungus is growing in my gut. I want to know what bacteria, and I've gotten richer data than they have. Any takes on using that clinically? I know it's so early days.

William: Yeah. It's a little pricey, but I think it's going to be at the front of generating data. So, a very common question in my world is, "Do you have small intestinal bacterial overgrowth that is ... have colonic organisms ascended up through the 24-feet of small bowel and stomach?" which I think, Dave, afflicts one to three, one to four of Americans, Canadians.

Dave: I had it big time. It was such a problem for me for years to the point I swallowed an electrical stimulation device from Russia. It was a little pill that would steam it to [inaudible 00:46:55]. This is going back 20 years or something. Yeah, I bought it online before Google. It was a very uncomfortable experience. It was probably the first swallowable medical device of my life, and it still didn't fix that problem, but I think I had it for much of my ... like the first half of my life, and it's gone now. Thank goodness, right? So, I'm happy you talked about SIBO because if you have that, you're not going to live a long time. Your bowel flora are off. It will be a long time. I would say for people who can afford it, the best test I know of is the Viome test, and I [crosstalk 00:47:30].

William: One of the questions I asked Helen Messier, their Chief Scientist ...

Dave: Yeah, I love Helen. Yeah.

William: Yeah, is ... because diagnosing SIBO is not foolproof. A little bit of hassle. A little bit of expense. The test is not perfect. No one wants to go through endoscopy, so the H2 and methane breath testing is a hassle. Not to mention 150 bucks per pop, so I asked her ... because they're assessing bacteria, bacteriophages. That is viruses of bacterias.

Dave: Yeah.

William: As well as parasites and metabolites. I said, "When you look at people with SIBO, verified say by H2 breath testing, are you seeing any kind of signatures for that?" Imagine they could say something ...

Dave: That, they do.

William: Yeah. Imagine they can say something like, "If you have the 25th ... 95th percentile of this and that metabolite and bacteria strains, you have SIBO, and it corresponds well with H2 tests." She said they're working on it. They don't have it, but I'm very hopeful that a testing like Viome, because of its comprehensive nature, will yield those kinds of really, really cool insights.

William: No one really knows what healthy bowel flora is supposed to look like. That silly Israeli study that made the news a few weeks ago where the whole series of studies, as elegant as they were, was based on whether you can return to your prior bowel flora. Well, you and I know that's ridiculous because we all start with some degree of dysbiosis and not overt SIBO, and so this idea that your whole golden life is to return to your prior bowel flora stage is an absurd concept. It's a flaw in logic, but I agree. What I love about bowel flora, Dave, is most strategies that emerge from inside the bowel flora are going to be nutritional for some and not stinking drugs, so I'm glad. This is a way I think for us to exclude big pharma and their exploitative ways.

Dave: I think it is, and it's what you put on your plate at the beginning of the day, and so I've gained a lot of knowledge about what was going on in my gut from the Viome test. Well, because I'm an advisor and long-term supporter, you guys have probably heard me talk about them before and Naveen has been on a couple times. He's also in Game Changers, but there's a code for Bulletproof which gets you something special on the Viome site, and I don't remember what it is. But anyway, we're buddies, and it is a pricey test compared to what we talked about. I would get this data that you're talking about here. You need to know your fasting insulin and glucose before you worry about what species of bacteria is growing or what level in your gut, but having that was really a big thing for me.

William: I wonder, Dave, if the solution to bowel flora is that somebody goes to the published science on the bowel flora composition of the Hadza or the Matsés in Peru.

Dave: Yeah.

William: That is people who lived hunter-gatherer lives, don't drink chlorinated water, have never taken antibiotics, don't have antibiotic residues in their food, et cetera, and their bowel flora, of course, is very different from ours. Although, these two groups of people living on two different continents who have never talked to each other, never had contact have very similar bowel flora.

William: Thereby, presumptively meaning they have stone age bowel flora. Of course, they have no diseases of civilization like type two diabetes. Virtually, no cancer. Virtually, no heart disease. Skin rash are highly uncommon, unless a source of the nematode, or infestation, or injury, so they don't have any of the chronic diseases we have. They have injury and infection, of course. Different collection of problems, but should somebody recreate a probiotic that looks like their bowel flora, and would that be the solution?

Dave: Yeah. It might be.

William: I keep on hoping some enterprising entrepreneur like Dave Asprey does that.

Dave: Well, I was going to go down there. I tried blending it with butter, and it totally didn't work. Just kidding. That was a bad joke, but what I'm seeing is fecal matter transplants are probably going to be a part of anti-aging in the future, and I have actually yet to do that. I've taken pig with whipworm eggs and rats, tapeworm larva to modulate the immune response in my gut, and I've got my ... My gut immune response is way down like I'm 9.6% body fat. I'm 6'4. I have 19.5 pounds of body fat in my entire body. My liver fat is under 3%. Like everything is good, and I was obese, and I weighed 300 pounds.

Dave: So, something is working, but if I could get like upgraded poop that gave me even more energy, you bet I'd sign up for it, so give me time, Dr. Davis. I think this will happen whether I do it or someone else does, and if you're listening and you want to start a business, bring some liquid nitrogen and convince someone in the jungle to poop and save all those bacteria because we need them in a bank just like we have a seed bank in Norway or wherever the heck we put it. We need the same thing for a poop bank. It's that important.

Dave: I also think there's a business opportunity for people to go out, and when you're born ... If you save your baby's cord blood for stem cells, shouldn't you save your baby's poop? As long as you didn't give your baby antibiotics and put antibiotics in their eyes and all that weird stuff they do in hospitals, there's nothing like that initial gut bacteria. So, if your baby does have to take antibiotics, you can actually repopulate with what they're supposed to have. This is part of the future of medicine, so I'm happy you talked about poop because these are important.

Dave: On that note, I have to say thank you for being on Bulletproof Radio, Dr. Davis. Your book, *Wheat Belly*, really woke a lot of people up to this idea that hey, what I put on my plate matters. Grains do bad things to humans. They're better than starving to death, but not that much better, and yes, they're delicious, and crunchy, and good, and it doesn't matter because heart attacks are neither delicious, nor crunchy, or good.

William: Well said, Dave. Well said, and thank you for being such a powerful and effective game-changer yourself.

Dave: Oh, I appreciate it. I know that I've sent you a copy of *Game Changers*, and if you like this interview and you like this data-driven focus that we just showed, you'll appreciate the book, so go ahead and order your copy on Amazon, or at your local indie book seller, or wherever else you'd like to support because authors like me ... This was ... Probably 4,000 hours went into this book and lots of statistical rigor to tell you, "Hey, here's how to kick more ass in everything you do." I'd love to share it with you. If this show is worth your time, this book is worth 10 times more than the show. Have an awesome day.