Diet Doctor Podcast

with Nick Norwitz PhD, Ted Naiman, MD, Michael Mindrum, MD and Ethan Weiss, MD

Episode 71

Dr. Bret Scher: Welcome back to the Diet Doctor Podcast. I'm your host, Dr. Bret Scher. Today we're talking about metabolic health, all things metabolic health. Now that's a term that's gained a lot more attention recently, but it's still maybe a little unclear to some people what it means.

Now when I talk about metabolic health in my brain, I know what it means to me. I know what it means when I'm trying to help a patient or help millions of people through our writings at Diet Doctor improve their metabolic health. But what does it mean to you? What does it mean to other experts in the field? And how has that changed over time?

So today, we're going to interview Dr. Nick Norwitz, Dr. Ethan Weiss, Dr. Michael Mindrum and Dr. Ted Naiman, probably names that you know from the Diet Doctor podcast before or from the world of metabolic health, but what we're going to hear is what metabolic health means to them, how that perception has changed over time, and also the intersection of metabolic health and nutrition, the state of nutrition research when it comes to metabolic health.

And finally, sort of the role of social media and how that plays for educating clinicians, scientists and the general public about metabolic health. So this is going to be a power packed episode with lots of information about metabolic health. Let's see what our experts have to say.

First up on our metabolic health journey is Dr. Nick Norwitz. Nick has a PhD from Oxford in ketogenics, metabolism, and neurodegenerative disease. But he's now embarking on a new part of his scientific and educational journey as he's an incoming first year medical student at Harvard Medical School.

Now, Nick, not only is educated about the world of metabolism and nutrition, but also has some personal experience, as you may have heard on his YouTube channel, or seen his YouTube videos, if you haven't, I recommend you check it out. But he was suffering from osteoporosis, a weakening of the bone at a young age, which is really kind of unheard of for young men, but also a severe inflammatory condition in his intestines, ulcerative colitis. And he went through the medical journey trying to find a way to reverse these conditions.

And it wasn't until he really ventured into nutrition, and started experimenting with low carb nutrition, that he was able to turn this around. Now that puts Nick in a really unique position, because as a first year medical student, he already has more scientific and personal experience when it comes to nutrition and metabolic health, which is going to put him on an uneven footing from his first year medical school peers, but also maybe even some of his teachers.

So this is going to be really interesting to get Nick's perspective on what metabolic health means to him, the role of nutrition, and how he sees the future of metabolic health and medical school education. So Nick, I don't mean to be putting too much pressure on you or too much weight on your shoulders.

But in a way I see you as the future of metabolic health and the future of medicine as I think it should be because of the position you're in with your personal experience, with your PhD and getting started on your medical education journey. So how do you feel when I make that sort of statement that you're the future of metabolic health?

Dr. Nick Norwitz: Very complimented and that's very generous of you. But I'm confident but I'm also very appreciative of the position I'm able to find myself in. I was talking with Brian Lenzkes the other day, and what he was saying is like people like you and Nina, you run a lot of the race already, while having like bricks thrown at you.

He talks about passing on the torch, I just feel very privileged that so many people have just done so much groundwork to get metabolic health to where it is now. And I feel like we're at an inflection point where it's just about to take off. And I entered this space, I was fortunate enough to have my health issues entering this space at a point in time where this was accessible to me.

But I had you know, my whole experience and found low carb I think if I had dealt with my health issues 20 years ago, I don't know what would happen. But I feel very lucky and fortunate that of all these people that have come before me and I feel like I'm standing on the shoulders of giants that I just... it's a pay it forward kind of scheme. So I feel lucky and motivated to bring it forward.

I hope I'm the right person to be able to bring it forward, but also bring my peers with me. That's why I'm so excited about starting med school. I feel like I can maybe serve as a little nucleus to bring people in.

Bret: Yeah, so you mentioned your own health problems, your own health journey. And it's interesting you said you were fortunate enough to have your health problems at this time, which is interesting. So I mean, I recommend anybody who hasn't seen it, to go on your YouTube channel and see your description of your ulcerative colitis and your osteoporosis at such a young age and in an apparently otherwise healthy person which can just be devastating.

But also your journey from physician to physician where people didn't really look at your diet, or they didn't look at sort of other potential causes, it seems like so give me your perspective on the current state of understanding of nutrition as it factors into health conditions, what your experience was, and what you hope will change.

Nick: I don't mean to make blanket statements, but I am kind of going to make one because I had experience with dozens of doctors in the state of nutrition with respect to these sort of chronic diseases is nil. None. I went to dozens of people, and it was either nutrition wasn't discussed, or I was referred to a nutritionist who just threw the rulebook at me.

And I was literally getting calls, like, you lost a little bit of weight, because of your colitis... I'm at school at this time. You know, have you had your fifth servings of carbs today? Are you eating your pasta, you know, you put on weight, just like eat whatever you can. Ice cream is great, like how many times you get ice cream today? These are real recommendations coming from Harvard nutritionists.

It's a very simple siko type model standard, MyPlate... and, you know, for some people, it may work, it definitely didn't work for me. You know, an acute the acute episode that really brought me to taking a little bit of responsibility was I was in Oxford, I just moved there.

You know, by myself living in a new place for the first time and I just had a terrible flare, lost 20% of my body weight, and I was actually in the palliative care ward of Oxford hospital for three days with heart rate in the 20. After all, that I was kind of brushed off. They said maybe I had like tumeric poisoning, which was kind of an absurd hypothesis.

Bret: So was it a flare of your old ulcerative colitis? In the palliative care ward is where people go like when they were sort of about to die? I mean, is that--?

Nick: My heart rate was in the 20. The thing that shook me is, it was the first time I ever experienced death... because two people died while I was there.

And people were running around with dementia, and I couldn't sleep because the monitor wouldn't stop beeping, if my heart rate went below 30, there was no way to turn off the alert, and it kept going below. So I didn't sleep for like three days. And after all that I'm just like, I just need to get out of here.

Bret: Did you think you were going to die? I mean, did you think... oh my God, like you have to face your own mortality at that moment?

Nick: It only came to my mind kind of after the fact in the moment, it's one of those, I guess I just didn't really imagine it as a possibility. Also just feeling really crappy. But after the fact that that's when I'm like, wait... it was an awakening for me, it was to, you know, the last straw that broke the camel's back.

And I remember getting back from that episode and lying in bed. And after like lying in bed for a day, I just thought, "This is it", I don't really have a way out, I'm a little bit hopeless. And that's what drove me to start digging to the literature and taking what I consider to be extreme measures, and really experimenting with diet, I had no expectation, but I had nothing to lose.

And one of the last things that I came to was, you know, a low carb diet. And when I tried it out, for me, everything just clicked, like literally within a week. It was absurd. I was home for the time being, and like markers of inflammation in my stool from my ulcerative colitis, called calprotectin, dropped from three times high normal to less than like low, low. And then it just stayed there.

And I came off my medications and it's never come back. It's never been an issue. So I removed the... what I consider the inflammatory insult and my conditions just resolved and all the physicians that care for me... There's a lot of like, honestly, doctor hating on Twitter, and I don't really like that because the system just doesn't permit for I think the kind of care that is required for metabolic conditions everybody that care for me, they genuinely were trying to the best by me, and doing the best they could under the circumstances.

And some people I came back to with my own ideas after the fact. And they were very inviting and wanting to learn. Like I said, we're hitting this inflection point that as it starts to take off, people are going to want to learn because they know this works. And their goal is to help patients. So when they figure out that this is what's going to help patients, more and more people are going to catch on.

Bret: Yeah, and that's what really puts you at the forefront of this, but also a very interesting po-

sition because you, let's face it, you're going to, quote go into medical school where you're the student, the first year medical student, the lowest of the low when it comes to medical students, and you're going to have more experience and knowledge than most of your teachers when it comes to nutrition and how that can impact chronic diseases.

And I mean look not to make blanket statements, but some attendants and professors don't like to be taught by people who... especially first year medical students. So how do you think you're going to be able to walk that tightrope or balance it without coming off as some like arrogant no at all first year medical student but at the same time trying to help people have been doing the same thing for 20 or 30 years see a different way of doing it?

Nick: That's a that's a good question. I think the first part is connecting with the students more than anybody. Because, you know, I think there are some... you know, senior people with a lot of potential, who just have that attitude of being lifelong learners. And I met some of those already. But the students are the next generation, they're impressionable, and they're my cohort.

So I'm going to be, you know, with them 24 seven, I could definitely start a club around this, in fact, I already tried to, it's a little bit difficult to zoom in being a pre matriculate. But I can sense that there is a will among the student community to be interested. And my understanding is that the institution really cares about the students voices.

So my goal really over the, you know, the time I'm there is to start to build a student voice saying, "Listen, we want this in the curriculum." This is important, this is the future, and take it from there. As for accessing my professors, I think it's just about asking the right questions to the right people. Just in general, and I'm sure you know, this is like when people aren't ready to hear something, there's no way you're going to teach it to them.

And so, selecting the right people that are actually maybe receptive to knowledge, now professors might be and then so I'll pick and choose my battles. But for those people who are receptive, I'll come with data and say, you know, what do you think about this, I will just make evangelical claims is as much as sometimes it's just that urge, but you know, if something's taught in lecture, I'll find the right paper to like, enquire about, you know, you said this, but I, you know, I read this here, what do you think about this piece of data?

They can't get angry at me from bringing up data and asking the question, so, I'll appreciate my place is at the bottom of the totem pole, actually kind of like being there.

Bret: But it is interesting, because on the one hand, I mean, that's a great response about the way to make it more of a question and engage your fellow students, I think that's a great approach. So on the one hand, you're at the bottom of the totem pole.

But on the other hand, you come in with a PhD in ketogenic, in neuroscience, and so you have the experience of how to interpret scientific evidence more than your average first year medical students and possibly more than your average attending physician too, if someone who's just super busy, you know, clinically, and not spending so much time on the research.

So what is your impression on the current state of the scientific evidence, not just like the US guidelines, but the scientific, you know, disease based institutions like the American Heart Association, the ADA, the quality of the scientific evidence that they use to make their recommendations?

Nick: Honestly, based on my personal experience, having this information thrown at me as a patient, and also in collaborating with physicians at Harvard, and knowing kind of what they know, what questions they ask, I think it's insufficient and poor, quite honestly.

Like I said, I think the tide is turning into this, a lot of open mindedness actually, towards different interventions for metabolic health, not trying to generate a "balanced diet, one size fits all", let's just kind of get every piece in there. So we're covering all our bases, but thinking more appropriately and mechanistically, about what makes sense for a given condition.

You know, now when I go to talk to physicians, and although the status quo right now for diabetes care is titrate, your insulin to your carbs, when you say, look, diabetes is a disease of high glucose and high insulin doesn't make sense to minimize dietary glucose intake and also minimize, you know, hyperinsulinemia or reduce hyperinsulinemia. And most would agree. Yes.

And when you show them the data, that shows a low carb intervention, can, you know, reverse diabetes or like, oh, this is interesting. I don't know why we're not doing this.

Bret: Now, you've probably heard the term metabolic health. It's certainly a term I like to use a lot because it means something to me, about my patients or about you becoming healthy in a specific way.

But what exactly does it mean? Let's find out by asking our experts here, what they think about metabolic health, how they define it, and how that definition has changed over time. Because it may be eye opening about what it means to you and what it might mean for the future.

Let's get some interesting answers from our experts. We're talking about metabolic diseases and metabolic health, but we probably should take a step back and actually define what that is. So how do you define metabolic health?

Nick: It depends what perspective you're coming from. If you're coming from the perspective of someone like me, who has dealt with a health condition, and I think a lot of people have that's a large minority, if not a majority, then achieving metabolic health is going beyond just coming back to the baseline of zero and absence of disease.

It's like, when I think metabolic health is just what emotionally comes to mind, it was that transition point between going from having no hope to figuring out this is kind of something that works to having hope and understanding, look, if I address core pathologies of disease, then it's just an... like it's continually improving future.

When I talk to, like clients who I work with, the mental shift I try to have in their mind is that like nutrition is an ever evolving N equals one journey where you get to experiment yourself and continually improve. So right now we're in a state in healthcare, where you think about diseases like cardiovascular disease and diabetes and Alzheimer's, and people who just think it's a downward slope.

Like you are where you are, and you kind of want to slow the downward slope, but it is a downward slope. Whereas when I think metabolic health I think continually optimizing over time and going upwards over time, rather than downwards, that's my personal definition for metabolic health. It's that kind of mindset, if nothing else,

Bret: Yeah, it's interesting. So you focus more on the mindset and the trajectory and not so much the specific. You could say disease processes or markers, because when you look up metabolic

health, you get metabolic syndrome, which is abdominal obesity and high triglycerides and low HDL and high blood pressure and high blood sugar.

And that's like, metabolic health as it's taught. But it sounds like you would... would you have some disagreement that that is what we should be thinking about for metabolic health?

Nick: No, no, I completely agree. I think my explanation was on this downstream of that. I wanted to maybe say something a little bit original, because, you know, to bio-optimize, you have to bio-track. So these tools like CGMs, and you should, you know, getting your... obviously you can't do this continuously, but things like HSCRP and full fractionated, the panels really delving into it is how you collect data on your own in equals one and how you iterate.

So you need those markers in order to continually develop and step forward. The mindset is required to translate those markers into continual improvement, if that makes sense.

Bret: Right. Next, let's hear from Dr. Ted Naiman. Now, Dr. Naiman is a primary care doctor in Seattle, Washington and the author of the PE diet. He's a big proponent on the protein to energy ratio in the foods that we eat, to maximize weight loss, metabolic health and body composition.

So let's see what Dr. Naiman has to say about metabolic health. So Dr. Ted Naiman, you are a physician working with a number of patients, thousands of patients over your career, and also with a personal journey of improving your health and your metabolic health. A big proponent on nutrition, specifically protein, but when it comes to this concept of metabolic health, how do you define it? What does it mean to you and your patients to have metabolic health?

Dr. Ted Naiman: For me metabolic health is really driven by body composition, is having enough lean mass and low enough fat mass that you can basically deal with any incoming energy or any incoming macronutrients. If you eat fat, you have plenty of room to store it in your fat cells. If you eat glucose, you have plenty of room to store it in your skeletal muscle, which is your main disposal site for glucose.

So I think that metabolic health comes from having enough lean mass that you can dispose of glucose and enough room in your fat cells that you can dispose of fat. So you know, if you eat carbs and fat, no problem, your fat cells just suck the triglycerides right out of your bloodstream on the very first pass, because they're fairly small, and your muscles just suck the glucose right out of your bloodstream, because they have plenty of storage space, and they're large, and they're mostly empty.

And so for me, it's really all about body composition. You want your fat cells to be not ever full or maybe half empty. You want to have tons of skeletal muscle so you can dispose of glucose. And it's really just having higher lean mass and lower fat mass, honestly.

Bret: So what's your go to form of measurement to help your patients quantify where their body composition is and to track whether they're making progress or not with their lifestyle?

Ted: My very favorite actual measurement is waist to height ratio. So you measure your waist at the belly button, you know, first thing in the morning after you use the bathroom, abdomen fully relaxed, you just measure your waist circumference at the belly button. You divide that by your height and your weight should be less than half of your height.

If your waist is over more than half your height, you probably have too much visceral fat. This means you're over fat. You've run out of storage space in your subcutaneous fat and now you're

storing fat in the visceral area of the abdomen which means you're basically insulin resistant and the bigger your waist circumference is, the more over fat you are and the higher your fasting insulin is going to be and your triglycerides.

You're going to have metabolic syndrome with high blood pressure and low HDL and pre-diabetes, and then you're going to be diabetic. And you basically go sliding down this slippery slope of metabolic disaster. So it really comes down to leanness, and waist to height ratio is my very favorite. Second favorite is just how you look in the mirror, you know, that's a really great, really great way of telling how insulin sensitive you are. And so you know, basically how you look and your waist to height ratio.

Bret: Next, let's hear from Michael Mindrum. Dr. Mindrum is a general internal medicine physician, who did his medical school in Louisville, Kentucky, and then his residency in University of Vermont and now practices in Canada, where he's been for the past 13 years. And he's definitely had sort of a transition in how he sees metabolic health.

And now his practice focuses on diabetes, and obesity, which you'll hear him say sort of he was not very big on or very excited about when he first started practice. He thought it was very cookbook and sort of boring. But this sort of reawakening of what metabolic health means, changed how he does his practice.

And you can find him on Twitter, at MichaelMindrum, M-I-C-H-E-L-M-I-N-D-R-U-M and we talk about social media as well with him, which you'll hear. And I think you'll appreciate his perspective on that, because it's a little bit different than what you get a lot of the time.

So Dr. Mindrum, you've been in practice for 13 years, and I'm sure there's been a progression in your thought process, how you see the science, how you treat patients. So tell us about how you see and how you define metabolic health, what it means to you, what it means how you see your patients, and how has that changed over time in your practice?

Dr. Michael Mindrum: Well, that's an awesome question. You know, I was trained as a general internist, when I went through medical school and training, when I got out in practice, to be honest, I didn't think too much about lifestyle. This was, you know, soon after I got out of residency. I, there's so much to learn in medical school, they're just about the pathophysiology of disease, the medications, it's a whole new language.

And we didn't get taught much about lifestyle or nutrition. And so when I got out into practice, I was an internist doing primary care in Vermont at that time, and a lot of, of course, patients with diabetes in my practice, and I would refer them to the dietician to the Diabetes Center, I really saw myself as the person to manage their medications, try to get their A1c to target.

And I remember back now thinking, you know, A1c of 6.8, you know, that's great. Is that really diabetes? Do we do we really need to add other therapies? Nobody likes taking medications. And I, you know, kind of thought about diabetes as a bit of just uninspiring kind of cookbook medicine.

And I had a lot of at the time, sense of futility about lifestyle, that that weight management was a bit futile, and to just stay in my lane at that time. And so that was kind of like the backdrop and to be honest, I had a lot of the bias and stigma that other people and the public have that, that obesity or complications of obesity were in some ways things people brought on themselves. And so I feel embarrassed about that now and doing my best to change that narrative.

Bret: It sounds like... you used the word yourself, you're sort of pessimistic and really down on nutrition as a therapy. And your view of metabolic health changed as your view of nutrition changed. So if you were advising, you know, a medical student starting medical school now, what kind of advice would you give them about nutritional science, how to learn nutritional science and how to learn how to use nutrition to help their patients and help people improve their metabolic health?

Michael: With nutrition... it happened for me, and I think it's happened to a number of other people where you see firsthand either in yourself or in your patients, the real significant change that can happen through lifestyle. And so one with a medical student, I'd have them connect with a physician that understands lifestyle interventions and nutrition, and so that they can see the impact it can have on patients.

For me, it was one of my first kind of it was five years ago and I think we all have the kind of like that patient zero. Sometimes that's ourselves, but sometimes it's clinical practice and I had somebody that came back three months after a visit after I prescribed a bunch of medications, and I saw their A1C had dropped like a rock, their blood pressure was perfect.

And I thought, you know, I patted myself on the back about how good my drugs had done. And he said, I didn't fill any of your prescriptions. So I was like, what, what did you do? And... "I cut the carbs"... And I didn't know what a carbohydrate was really, at that time. And I thought, well, he'll be back in a few months and we'll start the medications.

But that got me reading a fair bit. And, you know, I encountered some of the, the books from thought leaders in the field and reading and reading, and then met a couple people that were, you know, either they were just at wit's end in terms of caring for their diabetes, and no, I said, "How about I learn about this nutritional strategy with you? And we'll do this together."

We can get biased by early clinical experience, but one patient within a few months, you know, came back without insulin. And then a couple months later, we'd stopped her heartburn medications, or blood pressure medications, or inhalers, or insets. And so just a dramatic change where her med list went from twelve to one, and she felt incredibly better, and she gave me a hug. And I can't tell you in diabetes, how often I've gotten a hug before.

And that kind of thing starts feeling no, like, man, there's something to this. And so then seeing it kind of repetitively happen, I really started pinching myself, where you could see people who hate being on insulin or suffering with hypoglycemia and hyperglycemia come back, just feeling markedly better. So I think you get infected by that.

And inspired by it, by the patient's stories and experiences, and so the books... and the research is one thing, but being on the having that clinical experience is another so I think to a medical student, that's like saying, hey, this really matters.

Bret: Yeah, so that's interesting, you know, to help them learn by the patient experiences that they haven't had yet, right? Because they're medical students, so to get that experience and see the power, and that really, I think that really does help people shift their orientation, like you said, and I was in the same boat as you about pessimistic about lifestyle changes, until you see at work and you realize the message matters and what we're telling people matters.

Next, we're going to hear from Dr. Ethan Weiss. Now, Dr. Weiss is a cardiologist at UCSF, and he's also a researcher focusing on metabolic health, and is very involved in teaching the future generation of doctors and cardiologists as his role of a professor.

So he's got a unique perspective to be able to sort of go through all three aspects of medicine, the clinical practice, the research, and the teaching. So let's get his thoughts on this topic as well. So Dr. Weiss, I'm really curious to hear from you.

When you think back on your career from you know, residency to fellowship to early in your practice to now... how has your concept of metabolic health changed? And how would you define metabolic health at this point in your career?

Dr. Ethan Weiss: That's a great question. I'm not even sure I can answer that last question. But I can definitely tell you how to change, which is, I didn't even really think about it, probably until... I mean, other than the sort of, I was appreciated, obviously, the concept of diabetes of type two diabetes and obesity, but I didn't really think about metabolic health.

In fact, when my lab became interested in studying some models of mouse fatty liver disease, which was in 2008, 2009, I had never heard of mash before. So that's really puts it in perspective of how much my own personal education has changed over the past 10 plus years. So yeah, I don't think I really started to pay attention, probably until then.

Bret: So that really points to I'd say, a fault in the whole medical system and the education system and sort of teaching of metabolic health. So now you're sort of intimately involved in this educational system. So what do you think should and is changing for how we discuss metabolic health with, you know, budding physicians and medical students and so forth.

Ethan: I think there's been a trend over the past 10 plus years to have more conversations about general lifestyle issues, whether that's nutrition or exercise. And I also think there's been a push towards trying to consider and emphasize within medical education, how to enable and empower patients to be able to help themselves independent of whatever it is that we might do in the form of a prescription or surgery or procedure or something like that.

So I do think that there's been a movement that way. I'm also probably biased because I live in Northern California where there's a tremendous amount of emphasis on lifestyle and people here are generally fairly healthy and want to stay that way.

Bret: Yeah. Do you think it's complicated though teaching nutrition as medicine, to medical students and to physicians, because there's such a wide range of what nutrition is, and if different people have such strong opinions? So what do you see as sort of like the pitfalls and the ways to overcome them for teaching nutrition as an intervention for metabolic health?

Ethan: This is another great question. I think the biggest pitfall is probably the biggest pitfall within nutrition science, which is that the quality is sort of various body. And so I think this thing to begin with, when teaching nutrition, whether it's a medical student, or to anybody else, even a lay person, is to kind of begin by setting expectations for what we're looking at.

And to begin to give people some sort of ability to wade through all of the noise, right? I mean, if you take the example, We have talked about this one before, because it's just such an obvious one, but take the example of eggs, and you know, you can find a different publication on either how eggs are going to kill you, or make you live forever, pretty much any other day.

And so I think maybe the most important thing is to be able to arm people to begin to be able to decipher all of this information they're getting and give them some framework for sort of, well, what is evidence? And what evidence do we start with and what matters and what matters more?

And obviously, we all aspire to have gold standard of evidence in the form of, you know, randomized trials. But that doesn't exist very often in nutrition yet, hopefully.

So again, it's like giving people the idea that this is what we're gonna do with this, you know, with the information we have, this is how we make sense of it.

Bret: Yeah, so that's a great example. So, you know, let's role-play; a patient comes to you and says, "Doc, I just read the study that eggs are gonna kill me, but I love having a couple eggs, you know, a few times a week, what should I do?

Ethan: Yeah, so I get that question a fair amount. And I would say to a patient, which is probably the same thing I would say to anyone else is, look, there's a lot of noise. In the nutritional epidemiology of eggs, there's never been a randomized, controlled trial of you know, giving somebody an egg.

Even if we did give somebody an egg in a controlled feeding study, we'd be looking at some surrogate outcome like, you know, cholesterol, we wouldn't be looking at an outcome like a heart attack or a stroke, or somebody dying. So let's put it all in context. But within the world of nutritional EPI, which we all agree is fraught with a lot of potential confounding issues and variables and it's just, you know, imperfect science.

But even if you take it as being directionally accurate, the magnitude of risk associated with an egg in either direction, whether it's a benefit or a harm is minuscule. So what I tell people is, look, for the most part, if you're eating a reasonable number of eggs, like I have some patients who like to eat 30 or 40 eggs a week, I would caution those people that, you know, let's at least kind of see what happens with your biomarkers, right?

Even if you're going to eat that many eggs, I think that's at least keep an eye on things. But for an average person who wants to have you know, one to two eggs every few days, you know, on average, at what, seven to 10 eggs a week. I tell them that it's likely to be relatively harmless.

Bret: What do you think needs to change about the way we teach nutrition both to whether it's medical students or just the general public? What do we need to change in our message about nutrition and health? **Ted:** First thing would be the importance of protein percentage in the diet.

I think that's probably the most important factor of all. I think that overshadows you know, low carb versus low fat, plant versus animal. I think protein percentage of the diet is probably the single biggest lever anyone has to improve body composition, higher lean mass, lower fat mass, higher satiety per calorie, protein percent is really not highlighted the way it should be, in my opinion.

But the other thing I don't think we highlight enough, is the addictive nature of high energy density, carbs and fats together. You can take any kind of human junk food pizza, donuts, cookies, candy bars, you can feed it to any omnivore mammal and immediately just fatten it up completely.

In the lab, they just feed human junk food to rats to make these hugely obesogenic rat, and it's so powerful. It really isn't talked about enough, I don't think this specific combination where the protein is low, and the carbs and fats are very high and high energy density carbon fat together, drives overeating mercilessly and will basically make any mammal fat. It's just a fact.

Bret: So when it comes to eating more protein, the obvious answer is more than most people currently are eating. But you have a goal in mind, a percentage or grams per day, or gram per

kilos or something in your mind that you say this is our goal?

Ted: Yeah, absolutely. So you know prior to the last 50 years of the global "diabesity" epidemic protein was maybe 15% of human calories, but we slipped down to about 12.5% protein by calories in the US. And it's been a disaster. Obesogenic rat chow is redundant at about 10% protein. So we've almost reached that low point.

If you look at people who've lost a lot of weight and kept it off long term successfully, they're usually up to at least 20% protein. And if you look at worldwide hunter gatherer macronutrient estimates, they're at about 33% protein, your body builders are up at around 40% protein. So I think you really can look at this scale.

And I think your average person, if they're trying to achieve some sort of body composition, higher lean muscle, or fat mass, I think 30% would be a really good goal. We have studies showing that if you can get humans to 30% of their calories from protein, you will see a 100% reversal of pre-diabetes, even though people are eating as much as they want. And that's a huge big deal now that 52% of Americans are pre-diabetic or diabetic. So for me, 30% would be a really good goal. You know, for most people who are trying to recall.

Bret: So another quote, I've heard you say, is that "Doctors are not paid to be curious." And that's, I think I've probably said something similar to it. And so hopefully, we both think and maybe there is some truth to that. And that's stereotyping, because there are plenty of physicians, who are very curious and want to learn more.

But in general, those who are curious, aren't paid to do it. So the statement is still true, whether someone is curious or not that doctors are paid to see patients, they're not paid to be curious. Is that another paradigm that you hope you can somehow sort of knock down or bring more attention to?

Nick: But first of all, I don't think it's an unfair characterization, because it's not a characterization. It's a fact. And it doesn't mean you can't be curious. I think curiosity can be intrinsic to being a physician, maybe that's why you went into medicine. But the truth is, there isn't the incentive to be curious.

There's an incentive turning to our patients. And I think also you're quoting, a quote from me that was quoted from I think it was actually Ben Bikman, on your podcast, Episode 63.

Bret: So that's coming full circle, for sure.

Nick: But yeah, that definitely resonated with me, because I've met some people that are very curious, but I thought it was true, the incentives aren't lined up. And that's just a shame, in terms of changing that that requires and changing the entire incentive structure of medicine, the entire medical system.

And honestly, that is one of the things I bought into the most, how do you really transition to the system we have, from the system we have to a value based system, like it's a quantum leap, as it appears to me. Honestly, I don't know enough about really how the medical system is structured and have that vision to think about the transition point.

But I do think there are people in our sphere that have a really good points. I remember Adele Hite, talk about like, getting reinsurance and companies involved. And, you know, reinsurance was like insurance for insurance. So, I'm leaving that problem of completely, you know, redesign-

ing the medical system and implementing that redesign to my seniors and future me once I'm a little bit more informed on that topic.

But quite honestly, I don't know what to say about how we're really going to flip the script, because without really a government based board system, like they have say in the UK, and I think the UK system is completely broken, too. But, you know, at least there when you have like David Unwin doing his work, he's like, "We can save the government, like hundreds of billions of pounds." You can't say that here, because we don't have a government back system.

Bret: Right.

Nick: So it the same logic doesn't apply. It should apply, but it doesn't.

Bret: Yeah, that's the problem with prevention in our system, is if one insurance company is spending money on prevention on a patient, and then the next year, they switch insurances, that's now wasted money for that insurance company, that they're trying to make that person healthier because they don't reap the benefits.

So, yeah, I mean, you can argue for privatization, you can argue for government back, but that is certainly when it comes to prevention. I think that that is one benefit to a government back system, like you were saying. So in medicine, we tend to put everybody in buckets. You're a cardiologist, you're and endocrinologist, you're a neurologist.

But here you are, at least your experience so far with a very heavy neurologic focus on your research, a very heavy metabolic focus with your message and your personal history. You've spoken a lot about cholesterol, and lipoproteins. Do you envision sort of a cardio-endocrin-neurology specialists that you can sort of bridge the gap on all three or like how do you envision your future as a doctor?

Nick: Short answer... Yes, that is my hope. I think there's so many brilliant specialists that are great looking at an organ and telling you all about it and how to treat it. The issue is any metabolic disease, in my opinion, is a systemic disease. If you've Alzheimers disease, it's not just a brain, or Parkinson's disease or you know... diabetes is not just your pancreas.

So thinking in that way, it doesn't work at the patient level, especially when people have multiple conditions, like the way my conditions, the osteoporosis and ulcerative colitis, were diametrically opposed. Like so, you know, interventions that people were trying to implement from osteoporosis, like saying, gain weight and eat, whatever the hell you can, including fudge, and ice cream... was killing my stomach.

And then that manifested. So at the patient level, I don't think it always works. And right now, there isn't a specialty for whatever you just described, I would just call it metabolic health specialist. But what I do love about science and medicine is, you know, you look at it over time, more specialties are cropping up every like, a year, every couple of years.

So what I'm done with med school, in four years, and then residency and a fellowship, and another three, then maybe two more for fellowship, there's a lot of time for things to develop. So I'm not like putting my flag down. And I'm going to be this yet because I'm really hoping that like metabolic health expert does come up as a specialty and I actually know people who are trying to start metabolic health fellowships Dr. Loh for one.

So, you know, if one's not started, then maybe I'll do something in like endocrinology, and then

try to start one myself in a future year. But I think we need metabolic health to be its own specialty, even though it's you know, it seems somewhat general, it's quite honestly not like how do you treat the whole person.

And we're kind of already starting to get there with SMHP, I mean, the metabolic health practitioner certification and license like that's the starting point, that's really cool.

Bret: Really starting to bring more attention to metabolic health, which makes a lot of sense. Now, I'd love to see that start to infiltrate the education process, which hopefully will, like you say, over time. And now back to Dr. Michael Mindrum.

So questioning things actually brings up another point that there's a statement that doctors aren't paid to be curious. And doctors aren't really taught to be curious. Now, you don't seem to represent that, because you are very curious. But how do you think that statement applies in general to the medical profession in general?

Michael: Our education early on, and it might be changing with a small group learning... and back in my education, it was like the old school learned by fire hose and, you know, multiple hours of just consuming information and trying to regurgitate it. And the critical thinking skills aren't applied there.

And many of us feel creativity and just thinking about things, there's not time for it. And it's not encouraged, you could ask your attending questions, but you try not to ask them, they don't know. You certainly don't want to say, "Hey, I think you're wrong about this." Probably for many of us, either if you get the bug early, and are lucky enough to really get hooked by something early in the career and then can delve into it, that's one thing.

Others I think, like myself, once medicine becomes more comfortable, come across something like metabolism, or insulin resistance, or hyperinsulinemia, and see how lifestyle happens. And then, you know, I've got, by this point, my career, I can understand most of the things I encounter clinically, so there's room to start reading about things.

The job of the physician is misunderstood, as well, in the nutrition space, I'll give you one example is people that read a lot about say LDL cholesterol, who aren't physicians, they could very well know a lot more about LDL cholesterol than their family physician or an internist.

We have guidelines, for instance, that work most of the time, and we have calculators, and we can talk about it... does understanding how LDL cholesterol moves through the system help clinically for most physicians? They probably don't need to get into the nitty gritty, but then they could be criticized for not knowing, you know, that a lay person could know more about that than their family doctor.

And so I think it's a bit unfair, like you'd have to sit in a family doctor's seat for a day to recognize how much expertise is there and how many domains they're working with, how many hats they wear, and the full breadth of medicine that they're practicing. And then it might make sense that they haven't gone down the deep hole to understand all the particular specifics.

Bret: Yeah, that's a really interesting example about LDL, because it highlights how we teach guideline based medicine, which, as you say, works, maybe for the average or for the majority. But we're not taught when it doesn't work. We're not taught, you know, to examine what falls outside the guidelines, or maybe isn't covered by the guidelines and needs a different perspective.

And that's where these, you know, citizen scientists, these curious individuals outside of medicine, bring up some very good points that I think medicine needs to listen to. But you're right, it's hard to listen to all that. Because if you're getting it for LDL, you're probably also getting it for how do you treat low back pain?

And how do you treat headaches? You know, you have got algorithms for everything, but then there's also people who fall outside the algorithm. And so that's why I think maybe the curiosity needs to come into play. But you bring up a good point, you can't be... I mean, it's exhausting to be that curious about everything and to dive into everything, especially when you've got a panel full of patients.

So it's a good point to take the perspective of the primary care doctor, but at the same time, we can help the doctors practice to be curious and to learn. So we have to strike that balance. So I don't know if there's an answer. But you know, how do you strike that balance?

Michael: I think, you know, at the beginning, learning medicine is so stressful. There's so much to learn that the curiosity I have to learn more. I've always been curious. So I love this part. Like if a patient and I think it's maybe a personality thing, too. So if a patient brings up something new or has a different angle on it, I love just hearing about where they got that idea and so forth.

So whether it's personality or, you know, who goes into... I think most physicians are curious. It just might get stamped out of us a bit.

Bret: Another topic here is the use of social media channels to educate people, which is very different than the use of scientific papers and research or learning in medical school; you are developing a YouTube channel, which is already getting quite a bit of popularity, you are writing a book, which at the time of this recording will be out in a month or two, what do you think of the responsibilities for people on social media and writing books to be completely based in science and completely trustworthy?

And how does the public know who to trust and who not to trust on these basically unregulated venues?

Nick: That's a tricky one... on a lot of levels. Because just thinking about the scientific rigor, for example, everything you say, in social media, is not going to hit the level of nuance you want to say. When I put out a tweet, it is not reflecting the 10,000 word like paper I want to write on this topic.

And so there are some people who it's going to reach and it's going to be like a means to an end thing where, you know, the intention that I had, came through, and they got what they needed to, and then maybe we can implement it, then there's gonna be somewhere else in the Twitter sphere, who's gonna grab that and say, "But you missed this, this and this point," and they're dead right. And then you have to respond and to engage those people.

So walking the line between, you know, advocating a message that is simple enough, without, you know, misrepresenting the data, it's really difficult. And you actually, I want to give you credit, because I think you... there's some people that are really stellar at this... you're really stellar at this, Ben Bikman's really stellar at this.

And I remember when I was corresponding with you a little bit about a book, a point you made about the limitations of literature was... I was kind of Omega-6 bashing, which quite honestly, you know, I don't think is entirely fair, I think I was drinking a lot of the Twitter Kool Aid, so to speak,

and there's a lot of Omega-6 bashing on Twitter, secondary to, you know, negative speak, which I think is justified about like processed seed oils, in Western culture, but it's not necessarily the same as Omega-3 as a category of nutrient.

And so that's just one example of, you know, finding that little bit of nuance, and now trying to be better... aware of when I am drinking the Twitter Kool Aid... just help my messaging, because I think it's a difficult thing. And how, as for how people know, who to trust and who to follow, if two people know more than you, and they're having a debate, how could you possibly know who is right? Is that even possible?

Or is that just actually impossible. So I would like to say leave it up to the, you know, media sites to censor people who are just spreading false information. But since they don't know how to assess either, I feel like there's a better chance than not that like metabolic proper metabolic health is going to be the thing that gets chucked out. And then this, the standard, you know, standard of care... that as well is going to be you know, perpetuated.

So I think it just needs to be a First Amendment, open system. And hopefully, that science wins today. I think that's the cool thing about science is that it's sometimes slow, but science always wins in the end, right?

Bret: So Ted, you're you're pretty active on Twitter, and Instagram. And you share a lot of your graphics and your diagrams, which I think is great, but what do you see is the role of social media in helping educate the public? And what is your role as a physician on social media and helping achieve that?

Ted: Well, I think social media is, it's sort of a two edged sword, it's great, because all the information is out there. Like you can literally learn about anything on social media, it's all there. The problem is, there's a bunch of other stuff there, that's not really accurate. So it's now you're trying to find a needle in a stack of needles. So it's a little bit difficult.

You know, I actually feel sorry for people who are facing this deluge of social media advice, because they don't really know who to listen to. So it's a little bit tough, but I think that my role is to basically try to explain evidence based science to people in as simple a fashion as possible, and basically try to offer health advice that's like reasonable and rational and makes sense to people and fits the literature. And it's a little bit tough to navigate because I didn't exactly read the handbook of how to do this the right way, you know, before I started,

Bret: Yeah, that's the problem. That there isn't a handbook and I think part of the controversy and the arguments and the drama on social media can drown out a lot of the sage advice and a lot of the wisdom and the deep thinking and some of the great advice for someone like you give, so hopefully you can cut through all that, so more people can find you and learn from your message.

Now let's hear what Dr. Michael Mindrum has to say about this topic.

Michael: We all probably trip into the nutrition space or the lifestyle space through some personal perspective. And it's a personal experience, clinical experiences, we might get there through different avenues. And then you begin interacting with people that have shared some of your bias. And there's something really comforting, exciting about that.

And it's quite beneficial in a lot of ways for me, I got coerced into joining Twitter. And you know that's also a great area to learn. But you at first it was like, what are all these contrarians that are

saying that low carb advocates are zealots? Or no what is the problem... and you start navigating all the these personalities, these people and their careers.

And it's like a big drama. And it's kind of like trying to sort out who's who and why are people saying opposite things? I think the positive there is that it does kind of hone one's like critical thinking if they want to about okay, "Is there a different way of looking at this?" And some of the people that I thought were real jerks on Twitter or just naysayers are people I respect more than anybody now.

And I kind of get where they're coming from. It's exciting. There's drama. But there's also the role for sensibility and staying, kind of trying to keep an even view a bit of being a bit dispassionate, at the same time, about, you know, what does the science say? Can we look at this differently? Could I understand this person's perspective better?

Bret: Yeah. And you certainly lead the example for that, you lead by example with that, but like you said, there's a lot that we agree on, but it seems like social media focuses so much on what we disagree on, and you use the word drama, because there is a lot of drama.

And my concern is that people just get swept up in that and get swept up in the arguing and the ad hominem attacks and that, but I think you're you summed it up nicely, that the civility, respecting the people but maybe questioning the idea, intellectual curiosity, that's what we need more of. And I think I think you summed that up very well for, for social media, and you represent it. And now let's hear from Dr. Ethan Weiss.

Ethan: It's very hard to wade through the noise on a medium like Twitter. I mean, I just don't know if you are a layperson, I just don't know how you'd approach kind of figuring out who here is credible and reliable and who's not.

And some people, as you know, are extremely adept at persuasion and could convince you, you know, look, you don't have to go very far to look what's happened in the history of humans in recent history of humans with things like, you know, I mean... I hate to use this example, because it's extreme, but like, Jim Jones is able to convince 700 or so people to drink cyanide.

So I think it's easy, you have to basically be able to kind of separate out what's the message from the messenger, because sometimes messengers can be very persuasive. And yet, they're peddling messages that are either unfounded or flat out wrong in some cases. So I do worry about this. And nutrition is one of these rare things where everybody experiences nutrition every day, and everybody's got their strong feelings about it.

And it can be very difficult to kind of change somebody's mind, and maybe not even advisable to try to change somebody's mind when people are very attached to their ideas that, you know, I found this firsthand when we published our paper on time restricted eating, and there were so many people who got, you know, really angry at the result of me.

And the reason was that they said, "Well, this works for me." And I had a hard time explaining that I wasn't saying it doesn't work for you. I'm sure it did work for you. It worked for me. But that doesn't mean that it works for, you know, broadly and in a setting like a clinical trial in a population of people. So I don't know it's tough. Social media thing is really hard.

Bret: Yeah. And that's a perfect example. I mean, your time restricted eating study was a well-designed randomized controlled trial that tested sort of one aspect of time restricted eating and I

think that's sort of a problem that a lot of people had with it was they interpreted it as this encompasses all time restricted eating, and we're saying that no time restricted eating works at all but really, that's where you have to sort of focus on what this trial actually study.

And that's the question we answered we didn't answer every question about time restricted eating. Well, that's not the message necessarily people get on social media, right?

Ethan: No, they don't get that message on social media. And frankly, the traditional media didn't get it either. And I had to be careful. You know, I learned some lessons along the way and talking to different people, whether it was talking to lay people or talking to professional journalists that you have to be very careful about what you say.

And I tried again, and again, to be very careful to say what you just said, which is we tested one very narrow form of it, we also tested it in a real world setting. And we tested a prescription, we weren't putting people in a metabolic ward and feeding them certain hours and not feeding them. We don't know what people did or didn't do.

All we tested was what happens when you ask somebody to do this, versus what happens when you ask somebody to do this. And so again, the education bit of this is beginning to arm people, whether it's people in medical school, or even just people out in the lay world, to be begin to decipher sort of, what does this mean, and it's hard, it's not that easy.

Bret: So taking all this that we've discussed the changing face of metabolic disease, the changing face of nutritional education and research, what are you most excited about in the future, or where you see this whole field going, and what you think we can accomplish?

Ethan: Well, I will say that I am most excited. I mean, look, we can argue forever and ever about sort of what we did or didn't find and treat in our time restricted eating study. But the thing that I learned out of that beyond anything else, beyond any of the results of the science was that, hey, look, you can do these carefully constructed studies, this was actually not that hard of a study to do, wasn't that expensive.

So I'm excited about that opportunity, we all have to begin to actually build up a foundation of knowledge and evidence that we can then use to kind of come back to people and say, hey, look here, this actually supports doing things this way. Or it supports that this will have a favorable impact on X, Y, or Z.

Whereas I think a lot of what we're doing now today in practice is based on not much other than sort of opinion, or, you know, this plausibly could make sense based on a cell culture experiment, which to me is like, you know, absolute crap, like... like, so many people were so mad at me about the time restricted eating thing, because they're like, well, autophagy.

And literally, like the word "autophagy" appeared in my timeline or in our conversation 375 times. And I don't think maybe two of those people even knew what that word means. So anyway, my point is, I think I'm excited by the opportunity, we all have to be able to do good science, and we have some new stuff coming in.

I think, again, this is maybe even coincident with COVID. We're now learning that we can do well done nutrition, scientific experiments, even in people at home, and without, you know, sort of the really, really complicated expense of having to bring them into a clinical research center or even admitting them to a metabolic ward. So I'm hopeful about that, excited about that.

Bret: Can you give us any teasers or foreshadowing on what you're working on, that may be coming down the road?

Ethan: Yeah, we've got a paper that's coming out. I don't know, but we have a paper that's coming out, hopefully soon, we submitted the manuscript. And it was a clinical trial that we did is registered and published. Actually, the protocol is published, it was for this company that I advise or co-founded called Keto, which is basically we tested this program that we have, which is a ketogenic diet that we use, a feedback that people get, you can get from a breast center, this sort of enables, I think, knowledge and behavior change.

So this is sort of a freestanding, low carbohydrate diet program. And we tested that head-to-head against Weight Watchers, which is sort of one of the most, you know, prominent direct to consumer weight management companies. And so it was a randomized trial, it was about 150 people, it was 12 weeks. And we actually extended it or pre specified, we would extend it to 24 and then to 48 weeks, but we have the 12 week data all wrapped up and ready to go.

We did lipids, we sent everybody a scale. We, you know, basically got randomized, you got either downloaded the Weightwatchers app, you downloaded the Keto app, and you were off to the races. And so those results are coming out soon.

Bret: What were the main outcome measures?

Ethan: The main outcome was changing weight, secondary outcomes, pre specified spec, secondary outcomes were all the things you'd expect. So HbA1c, fasting insulin, we didn't unfortunately had the capacity to do body composition analysis.

But we did a whole series of other things, including lipids, we did liver function tests. That was the basic stuff and then we did what's called ASA24, which is a survey of asking people what they ate. So we cut it, again, it's self-report. So it's not going to be the most robust data set, but we're able to... at least be able to compare what people ate before and after they started either diet, and then compare between the two different diets, both in terms of all the macro and micronutrients, but also in terms of calories.

We also got to ask people sort of how they felt. We did a, I think, a sleep survey, a validated sleep survey. And then we also asked people a lot about the impact of COVID. And so one of the things that we were curious about was, how difficult or easy was it to adhere to this diet intervention? When you know, we're locked out or something, you know, because we started enrollment for the trial in December of last year. So just over a year ago, we've wrapped in November, so it was basically a COVID study.

Bret: Yeah.

Ethan: And so yeah, all that's coming. And I will tell you without giving away the answer, that it's a super cool result, it was definitely surprising to me.

Bret: Okay, that's a good teaser. I look forward to it. But the bigger picture, like you were saying is these trials are totally doable. They're not out of reach. And we need to be doing more trials like these, rather than just relying on epidemiology studies.

Ethan: Yeah, and these are... look, we tested two commercial products, basically, it made it easy, because it didn't, we didn't have to build anything, right? They were already built. So we were able to just assign people to one of these two things. But it was an entirely virtual, you know, trial.

So we never touched the people. In fact, they were enrolled... For technical purposes, they were enrolled only in California, but they're enrolled all throughout the state of California.

So they never came in person, they went and got their blood drawn at a local diagnostics center. And then everything else was done in home. So, and again, we didn't design it with COVID in mind, because COVID didn't exist when we started. But it's sure was a great way to run a trial during a pandemic.

Bret: Yeah, that sort of opportune timing, I guess, shows your ability to sort of pivot and take advantage of that. But yeah, so there's the results of the trial. And then there's what it represents for future trials. So I think that's important. So what are the take homes that we can walk away from these interviews with?

Well, I think the first thing, it was amazing to understand how the concept of metabolic health has changed for pretty much everybody over time, and how for people who've been practicing medicine for a while, it wasn't even really thought of or discussed as an important concept back in training or in early practice for a lot of them. And the role of nutrition for metabolic health was even less of a discussion.

So now we can clearly see how that's changed. And I think that's so encouraging, because with the more discussions about metabolic health, and especially for the nutritional interventions for metabolic health, it shows a potential bright future so that we're not going to see any more of these studies, like the one showing 88% of all Americans were metabolically unhealthy. That's just unacceptable. And that is an absolute failure of the medical institution.

So now hearing from Dr. Mindrum and Dr. Weiss, and Dr. Nieman, that that trend is clearly changing, certainly for the people we interviewed, and hopefully for the future generations like Dr. Norwitz, and all the doctors to come. Now this trend is definitely going to change. And the other sort of encouraging aspect is how we're starting to understand more about nutritional research.

All research is not the same. I think everybody pretty much echoed that it is clear there's variations in the quality of research and nutritional research in general is pretty poor. But Dr. Weiss gave us some encouragement. And again, some bright spots for the future of how to run some of these higher quality trials that may give us more information and certainly more important information than then the nutritional epidemiology studies, which are notoriously weak.

Now, the other factor that was really interesting in these discussions is the role of social media, right? Because not everybody's going to get their education from their doctor, a lot of people are turning towards social media. And you can see how, how confusing it is. A lot of people were saying, I don't know what to recommend for social media.

But if I were to sum it up, I'd say I think the keys are to focus on the people who discuss the ideas, the people who are open to other ideas beyond their own, and try and focus more on the facts. I know that's a that's a tough topic when it comes to... it's a tough word when it comes to these topics. But that focused on the issues, because the people who are focusing on the issues and less about personalities and attacking each other, I think that's where the best discussions happen.

And I highly recommend following any of the people who were interviewed on this podcast because that's part of why I sought them out because they focus on ideas, they're deep thinkers, they like to talk about the issues and they don't get caught up in the noise of social media. So I hope this was a helpful format for you where we talk more about the ideas more about the con-

cepts and go deeper into them and get a variety of different opinions.

So please leave us some comments if you think this was helpful, because we can definitely do more of this type of format on the Diet Doctor Podcast to show different opinions about where the common ground is and where there are some differences that we can work on for the future and hopefully help you walk away with a stronger base of knowledge of what it means to be healthy and how you can improve your own health. So thanks a lot, everybody, and we'll see you next time on the Diet Doctor Podcast.