

Diet Doctor Podcast with Ben Bocchichio (Episode 39)

Dr. Bret Scher: I'm joined today by Dr. Ben Boccichio. Now Dr. Ben, or "Benbo" as he's known, was really quite a pioneer in the world of low-carb lifestyles and resistance training and high intensity interval training. He started this back in the 70s and has continued with it today and when you hear him talk, you're going to see his passion, his knowledge and the impact he's had on a lot of the people he's worked with and one of the things we talked about is the concept of you can't outrun a bad diet.

And he has a different perspective on that that I think will be really important to hear. I mean he knows his stuff, he's got his training, he is a PhD in exercise physiology and a second PhD in health and physical education. And like I said he has been in practice since the 70s helping people.

And it's important to hear sort of the counterbalance to, 'oh, we don't have to worry so much about exercise', and his point is exercise is absolutely crucial when done correctly and works synergistically with diet to help us metabolically and help our health. So I hope you really appreciate and enjoy this interview with Dr. Ben Bocchichio.

Dr. Ben Bocchichio, thank you for joining me on the Diet Doctor podcast.

Dr. Ben Bocchichio: My pleasure, Bret. Always a pleasure to see you.

Bret: I've learned so much since I've met you and one of the things that really was remarkable to me is that you've been doing this new thing called keto... low-carb diet and high-intensity interval training, this brand-new fad thing since what... 1974? Is that right?

Ben: Yeah, actually personally before that, but professionally and clinically started in 74.

Bret: So give us some of the background of how you got started in this with your education and then what you are seeing in your clients and in you personally.

Ben: Well, I started off being an athlete and my family had scientists in it and doctors, my parents were educators, my father was a firefighter and a teacher and I always liked sports and I was always fascinated with the training. One of my cousins, great cousins really, we call him uncle, was the trainer and manager of Jersey Joe Walcott, who was the world heavyweight boxing champion before Rocky Marciano.

So I used to go to the fights and I get to go in the gym and watch these guys train and box and stuff and I was always fascinated by it. And as an athlete I was always really interested in how to train to be better at the sport, but I really like the training part as much as the sport in some cases and so I decided I was going to study this in college and I got a degree in phys/ed, health and science and then a Masters in education with a specialization in resistance exercise, then I did a PhD in exercise physiology.

And the second one after I was in practice for a while I had a low back center in Miami, everybody was overweight. I had the largest fitness center in New York City, most people were concerned with their weight. I had a cardiac rehab center... and most of the problems for those people was they were overweight. And I had a pretty good business going and I had time, I decided to take a second PhD to get serious and study obesity.

So when you do a PhD you do a review of literature, so you have a theoretical basis for your hypothesis. So my review of literature was the development of obesity and fat related disorders. So about 8 or 10 years before Gary Taubes wrote Good Calories Bad Calories, I interviewed and studied a bunch of the people like he did for his book. So when that book came out I got ahold of Gary and we've become really good friends and done seminars and presentations together and so I got into that.

But as far as the low-carb thing, to me was all first-hand observation. People wanted to get lean and the leanest people that I knew were bodybuilders. So I kind of asked them. It's kind of like asking a race horse how to run fast, but I asked them what they were doing and I kind of observed what they were doing and they were low-carb. Before a contest these guys were low-carb, big-time low-carb, okay.

And I thought that's a good way to go and I didn't mind it because I loved eating meat and I did it myself and I felt really good and at that time I was still a fairly elite athlete and I felt great in my performances, my energy and everything, in physique... And, you know, I am not a bodybuilder, I always had a decent set of Italian muscles, so I started doing that and I used it for a lot of my first clients and patients and subjects and studies that I did.

And so we did the keto and then I created in 1974 slow resistance training. And the basis of that was high intensity training that was safe and productive. And I really started out training athletes. In fact, going back to 1974 it might be interesting to note that I didn't even first consider that women could do this. There wasn't such a thing. So I had a model come to me, an Olympic volleyball player gal and they work their butts off and I said... light went on... they can do this too. You know, I literally did not even consider that as part of my model.

So it grew rapidly into orthopedic rehab, cardiac rehab, metabolic disorders, all kinds of-- you know, sports training and so my clientele just got diverse and big very fast. By the time I was, I think, 27 years old, I had seven of these facilities, centers all over the East coast and that's the deal and I've been doing it ever since.

Bret: So you really were sort of one of the pioneers in the field because now it's incredibly popular and people are talking about low-carb, but back then really not many other people were talking about it.

Ben: Well, low-carb actually I've seen about three iterations in the 45 - 50 years that I've been doing this. You had the Stillman and then of course you had the Atkins in the initial stages. And he was in New York and I was in New York at the time and then these things got hot and then they went away and I think I'm trying for this not to happen in this iteration but I think we have more solid science and we have better people to represent this drive... this issue.

So I think this time it will stick and I want to-- but one of the things, you know, and I think Steve Phinney-- I realize Steve is almost as old as I am and I realize we have kind of a similar perspective on some of the new claims made by the keto community. So, you know, pump the brakes a little bit. So we don't get into that, you know, getting ahead of ourselves and making claims that are going to make us less reliable.

Bret: That's a great point because when something becomes hot and something becomes a new catchphrase and people are benefiting from it, it almost turns into a cure-all. And then you start to sound like you're selling snake oil because the one thing can cure all. So what do you see as some of the areas where you think maybe the low-carb community has gone too far and needs to pump the brakes a little bit?

Ben: Well, not intentionally but anytime things get hot like you say, people are going to jump on the bandwagon. You have keto socks, keto bowties, I mean to use the word, my point is, you know, we have a specific set of metabolic issues and parameters that we deal with and we have science to back up the fact that we have some benefit derived from that practice.

But some of these claims-- one of my pet peeves is-- and I'm not going to mention names unless you want me to, but some of the claims that are being made for example about fasting, I think are still a little over-the-top and are unproven.

Now I wrote my first article about fasting in 1978. I was trained in therapeutic fasting by vegans who had a therapeutic fasting clinic and I saw some wonderful results from this stuff. I mean arthritic conditions-- I will tell a story about a girl that came in there at 12 years old and had had her tonsils out at nine or 10. And after she had her tonsils out she started to decline in her performance at school, her attitude, behavior.

And at that time they used ether as a-- So they fasted this girl, 12-year-old girl, I watched this and I think on the fourth day of fasting-- So fasting to me is not eating... eating once a day is not fasting in my mind, in the therapeutic fasting genre, okay? But anyway, they fasted her for four days and in the fourth day she felt better and the room stunk of ether 3+ years later.

Bret: That's bizarre.

Ben: Yeah, if I didn't see it, I wouldn't-- But then she felt better. So I saw arthritic people come into that place that could hardly walk and some of them fasted two weeks; I'm talking two weeks with just water.

Bret: Now that sounds like you're talking about fasting as a miracle cure, but you said you have some concerns about--

Ben: No, it was therapeutic fasting. That's different from what we're doing in conjunction with keto. Now I didn't say it's a miracle cure. I think it's a good modality when used prudently. There is a sweet spot for almost anything; a drug, a behavior, okay? And this is one of them. I have no problem with fasting I think in most cases, responsible fasting, I have no problem with what they call intermittent fasting and we used to call it eating once a day.

So the fasting thing connected to that to me is a little bit-- I spoke to somebody yesterday who was fairly knowledgeable and we had a little bit of an argument. And he said really technically the four hours between my meals is when I'm fasting. I said a fasting person doesn't accept that. I mean so that means every minute that you are not eating, you are fasting... I don't consider that to be the right terminology and the right application of the concept.

Bret: There has to be a threshold somewhere to cross before--

Ben: Usually in my practice, we are talking about not eating for a full day. So you're sleeping without having eaten that day. So I don't want to get too tackled, maybe it doesn't matter, but it just bugs me.

Bret: Well, this is interesting because the term gets adopted, popular landing it's thrown around and you want to make sure that you're using it in a way that's actually going to benefit people significantly. People want to get the maximum benefit for the minimal effort. So if you say fasting six hours is going to benefit me, well, okay it's probably better than snacking but it's not going to have the same impact as fasting three days. But again each is a tool to be used in a certain circumstance, not that they're all good for everybody in every circumstance.

Ben: Okay, I'll go with the subjectivity and individuality of it, all right with that, but if you think about it, Bret, if you eat breakfast lunch and dinner, you are fasting four hours and five hours... is that the case? No, I don't consider that fasting. Let's not beat a dead horse, but you get the idea. The claims that I'm talking about are the metabolic claims of fasting.

So let's go to the cellular-- I am a muscle guy, okay, so I know muscle physiology, I know protein synthesis kind of pretty decently, okay? If you're claiming that during fasting you can up-regulate protein synthesis, it's a tough swallow, because certainly no cell is dumb enough to basically grow in the absence of nutrients and no organism really does that. Now can you temporarily or something--? Now the HGH claims, okay?

Bret: The growth hormone.

Ben: Yeah, the human growth hormone claims that during fasting the HGH basal level or responsive level goes up. Now I think, this is my opinion, this is not science yet, because there isn't any, that this is this furtive effort of the cell trying not to die and so it's pumping a little bit, you have these spikes in HGH, without much area you have some amplitude. Because the cells say, "Please don't die. I am to try to get some HGH into this thing, so I don't die."

I think that's different than HGH from exercise and some of those study show that you can increase HGH to double the basal rate. But by the same token my pitch is... there are plenty of studies that show high intensity training exercise, muscle training, increases HGH by 15 to 20 to 25 times. So I think that if you calculate that these things are somehow equivalent I think it's just silly and I think a little irresponsible.

Bret: Interesting, that's a big statement. So I definitely want to get into the exercise, but you've distracted me here with the fasting, so I'm going to keep going with the fasting. So one of the big concerns about fasting is loss of muscle mass. That's one of the biggest concerns that are going to put people at risk of sarcopenia and accelerated muscle loss and you are the muscle guy, so what do you think about that?

Ben: Again I think it's how you apply the modality. So I think some fasting and I think that autophagy is part of this whole cycling, you don't build muscle from exercise, in fact you a little bit break it down for a day or so and then you start to rebuild. Protein synthesis becomes-- the ribosomes become more active, the mitochondria-- because you've demanded energy, these are good things, these are useful anti-aging, if you want to go there, things, longevity kind of things, they happen, okay? But there was a time at which you can have this degradation. I think Steve Phinney is going to speak on this, but I see the same thing.

Now years ago I did a fasting experiment with about 12 athletes and at that time we used a hydrostatic weighing in, you know, under water weighing for body. I wanted to see on a five-day fast what happened, what I could measure. This was maybe late 70s or early 80s at the latest. And I did it myself. And the first two days according to hydrostatic weighing we lost lean tissue, no question. Now understand, Bret, that hydrostatic weighing considers everything of equal or higher density than water to be lean.

Bret: Including bones.

Ben: Of course but I'm saying, understand the key word is "water". Water is considered lean in hydrostatic weighing. So you know on a low-carb diet or keto diet you'll lose water the first few days, right? And since muscle is 80% water, fat 17, it's assumed in an algorithm that it's muscle.

Bret: I see.

Ben: Okay, but this is what it showed and that was the gold standard at the time for body composition. So we lost muscle the first couple of days and then in the last three days we lost equal amounts of fat and muscle. So there is some indication that we are definitely losing some muscle.

Now I don't recommend five day fasted un-therapeutic and un-supervised. But in the lexicon now, you know, once a day eating I don't think has this drastic effect, I think that's perfectly fine. I knew plenty of people, I'm talking hundreds of people that ate once a day and did well and had huge muscle mass and kept it into, you know, extended years.

Bret: So when you work with people and have them fast under supervision--

Ben: I don't do that.

Bret: Okay.

Ben: I mean I understand how to do it, but I really haven't done it because that to me gets into almost of a medical practice or an application. I am familiar with, but I don't feel competent in supervising it.

Bret: So in your opinion then without science and just your opinion would light to moderate resistance training during a fasting period help offset that muscle and lean tissue loss?

Ben: Good question. So basically we're talking about what is the priority of the organism. Is it to sustain muscle or is it to preserve energy? So it was more important

for us to have the energy to go out and hunt to get the food or to have the food to go out and hunt? Okay, so the chicken and egg a little bit. So I'm not sure but if you're talking about intermittent fasting or one day fast you can do anything you want.

There are guys that have played NFL football, that have run Olympic races in that condition and there's no evidence-- But again now it depends on the response, like any medication, like any behavioral intervention, depends on the response, depends on the pathways that we've induced to what level, for the individual, but in my experience I've not seen a problem with that at all.

You can go high-intensity, you can blow it out if you want. If it's one day fast I haven't seen any problem. Now do I think-- to answer your question, doing some exercise during a fast, a three day fast or something you could-- I have no reason to believe and I don't think there's any evidence in the literature to believe that at least moderate intensity exercise would be damaging. I don't see why it would.

Bret: Okay, so now we are on the exercise topic. The big phrase that I know kind of ruffles your feathers a little bit... you can't outrun a bad diet, right? That's been a very common phrase that we've heard and for good reason, because for a long time it was just this "eat less, move more" message that we know doesn't work for the majority of the people. So then that transitions to "you can't outrun a bad diet", basically meaning you need to focus on your nutrition first before you start exercising for weight loss. But tell me your thoughts on this statement.

Ben: I don't agree with that. I gave a presentation on low-carb here yesterday and I said if you don't use both of these modalities-- there is so much synergy when we undertake any kind of a treatment, behavioral, pharmacological, whatever it might be, we are instigating or attempting to directly instigate certain metabolic pathways. That's really what we're trying to do, is it not?

With keto diet we're trying to instigate metabolic pathway. So we identify these pathways, so we know what some of them are and I can show you literature and pound for pound how high-intensity exercise is at least an additive if not a synergistic component of this. You're going to get much more bang for your buck and I can instigate a lot of those pathways without being on a keto diet. So what's more important?

To me the sensible way to apply this is together. So I don't think-- Now behaviorally I understand if you get a 350 pound diabetic and you don't want to give them too much to absorb behaviorally as it's going to be ominous... "I have to watch - I can eat bread and I have to exercise..."

Okay, I could go with that but physiologically metabolically I do not go with that. I mean I think you have to exercise the muscle systems power and efficacy as an endocrine organ has been underestimated and we in medical and the graduate school have not been taught to recognize and appreciate it.

Bret: I think that a number of good points is that one, we don't want to overwhelm people by giving them too much, so sometimes simplifying the message to say just focus on your diet and don't worry about exercise is an easier pill to swallow so to speak, an easier transition to make. But your next point is if you want to have maximum effect, then you also have to consider the exercise in addition to the nutrition.

But when you used the word high intensity interval training, I think that's come to be synonymous now with sprinting, with, you know, treadmill repeats or bicycled repeats as hard as you can for 30 seconds or a minute, you know, the boot camp type workouts. But you use that also to mean resistance training.

Ben: No, I actually I don't use it to mean any of the things that you just described. That's hard work. If I give you a pick and a shovel and ask you to dig a 20 foot trench 6 feet deep, that's not high intensity training, interval training. That's not productive exercise, so I don't agree with that. High-intensity exercise is a direct organized muscle fiber recruitment pattern for your body for the particular workout, the timing between the workouts, the methodology of the workout.

What we are trying to do is to induce these fight or flight, life or death, type 2B muscle fibers to come into play and tax them to a threshold level. So now we have certain parameters that are human parameters. Nobody can work at a high intensity with those type 2 muscle-- type 2 fiber sorry-- type 2B fiber was more than probably about 90 seconds.

So if you're going longer than that either you have the lower the intensity-- So it's not that it's hard exercise, it's not that it's demanding and grueling, it may be all of those, but that's not what defines high-intensity exercise. So this is a universally applicable concept. If somebody is very sedentary having them get off that share three times may tax their type 2B muscle fibers and therefore they are in a high-intensity metabolic load.

So the concept that we normally... "High-intensity, oh it's hard"... You know, that's my little red badge of courage, has nothing to do with it. It has very little to do with it. It's this... in my mind, this is a prescribed controlled environment to tax those muscles to this threshold level under control, safely and in a sequence of time and recovery that's organized and subject to physiological parameters that we know exist.

Bret: Yeah, so it sounds like on the surface that this will require somebody who's already fit, already knows what they're doing, has gym knowledge, but no, you say this can happen.. anybody can do this.

Ben: Today we just trained 15 or 20 people, some who had major orthopedic problems, some who haven't exercised in 45 years, some who are obese many of whom were diabetic and don't exercise; we just did it with them at every level, from I would say 25 to 75 today. And I've done this tens of thousands of times. So you can do this at any level.

My last slide said, you know, fat kids, rich kids, poor kids, anybody can do this. In any case you can do this with anybody. I did it with phase 2 cardiac rehab patients, I did it with orthopedic patients, I've done it with people in wheelchairs, I've done it with the world-class world record holder athletes, kids, older people. All we're trying to do is to tax those fibers. And subjectively it's the same demand but objectively could be totally different planets.

Bret: So how does that work then when you're taxing these fibers, what's the mitochondrial effect? What's the cellular effect that you can see with this type of exercise?

Ben: So what happens is... this is something I'm going to get across and I put this and in my talk... so we're doing what most people consider strength work. I just consider it muscle taxation. So we're doing something locally in the biceps or the quads or whatever we might be working. There is a global support mechanism.

The circulatory system increases, the respiratory system has to supply oxygen, your breathing accelerates, hormonal changes happen, skeletal system adapts, neurological system... okay, so the driver of all these major organ systems is exercise, muscle contraction if you think about it.

We would not have needed a heart that can pump 10 times above normal if we didn't have a muscular demand. We would not have to breathe four times, seven times more oxygen per unit of time if we didn't have to do some exercise... some muscle action didn't demand it.

Even the brain - the brain didn't grow, you know, until it grew much more significantly when we had vigorous exercise and we know that the more you exercise or at least you tax these muscle fibers at a certain level, the more the brain increases the neural transmission capacity. So my point is the muscle system is really important and I don't know if I'm going off track a little bit, but with that in mind we tried to develop the system that's safe and scientific and not time-consuming but it is universally applicable. You don't have to have-- I mean, you can do this with bands at home.

And if you saw Doug Reynolds and I doing on Low-Carb USA, me taking him through it and Doug is a pretty strong guy, he got his butt kicked just using bands. And it took us I think 12 minutes to go through his whole body. So it can work, it does work, it's applicable.

Bret: Yeah, that's a really another important part about this is the barrier to access, because some people say I don't have to drive to the gym and change my clothes and I don't have to spend an hour. And you are saying, "No, do this at home, do this with simple equipment, do it for 10 to 15 minutes and you're good as long as you do it correctly."

Ben: I mean if that's what you want. Some people like the social atmosphere of the gym and some people have a different piece of equipment, I have no problem, but you have to reach those metabolic thresholds, those fatigue thresholds, that taxation of those type 2 muscle fibers whatever the modality.

Bret: I think that's the key; you have to work each muscle to fatigue, each exercise has to be to fatigue.

Ben: Yeah, okay interesting-- I don't know if you've heard of-- Let me see... Keith Baar...

Bret: I don't think I--

Ben: You got to listen to Keith Baar. He is an exercise physiologist research cellular dude, at UC Davis top-of-the-line. mTOR guy, knows this stuff. In his research in a petri dish he has come to the conclusion that muscle stimulation should be slow in nature, it should be probably a couple times a week and each exercise should be taken to failure.

Now that's exactly what I do. I came from the gym 50 years ago and came up with this. He came from a petri dish and we've arrived at the same place, which is interesting. And can I'm to get a hold of him and we're going to have some contact, maybe do some studies, but this is pretty interesting, this is really what works primarily and almost exclusively, this kind of formulation.

And so again one of the things I brought up in my talk was that if you are in the top one third for muscle strength in your age group for your gender you are 25% more likely to live to be 100 and at least 40% less likely to die of cancer. As an isolated variable; if you are diabetic, if you're overweight, if you're a smoker, it doesn't matter, it doesn't reflect on that statistic.

So muscle strength as we know... so you asked me about sarcopenia, okay? So sarcopenia is almost always a matter of lack of physical activity or endure exercise, which I consider two separate and distinct issues.

Bret: Important differentiation.

Ben: So activity offsets the problems that kind of occur with sedentary behavior. So as a species if we were sedentary, you died. You couldn't get away from the predator, you couldn't get the food and water and shelter. Now we die but it takes 65 years.

So that's activity and I think you should be active, but exercise is every three or four days taken down a big old animal to eat, working your butt off for a few days, taken easy and then you got to go out again. But if you had to do that every day, you would've been dead. You couldn't have sustained it. So there's a recovery genetically determined from high-intensity exercise.

Bret: Very interesting... so to go back to the original statement, "you can't outrun a bad diet", would you say that's true, but you can out-lift a bad diet?

Ben: Yeah, I mean we know that aerobic "cardiovascular" exercise has proven to be useless in fat reduction. There's no question about it; it's the wrong prescription. So the prescription came out... the history of this came out kind of simultaneously. Fat's bad, eat carbs, start to run. Those things happened almost contiguously, simultaneously they happened. So what happened when we applied those techniques?

Bret: People got fatter and sicker.

Ben: People got fatter and did more and more exercise and ate more and more carbs. So the physiology of aerobic exercise instigates fat usage, but fat recycling. So here's is one of the things that I put into my book and I think people understand. There's fat borrowing and then there's fat burning.

In an aerobic cycle the normal fatty acid to triglyceride cycle happens continuously. We borrow from that cycle for aerobic exercise. That's why it's steady-state. Steady-state by definition means it doesn't make a big imposition on your metabolism. Right? Because you can sustain it. If we do type 2B high-intensity exercise, it is anything but steady-state.

It drives an adrenaline response. That adrenaline response produces a release of free fatty acids, because I'm running out of glycogen or I'm being threatened of running out of glycogen, the life-and-death fuel and so your body says, 'we need some backup here because I think I'm running out of this'.

Whether you run out of it or not, I think if you threaten that, if you deplete at a very high rate, your body gets into this survival kind of a mode, it releases adrenaline, which in an amplification cascade produces this free fatty acid release. And adrenaline I think can cleave I don't how many thousands of molecules of glycogen. Just one molecule of adrenaline, so it's a powerful potent-- So now what we've done in this fat cycle we borrowed from our stored fat, we've actually used, we've now taken this out from triglyceride into free fatty acid.

So when we're done with exercise as opposed to when you're done with aerobic exercise, you've borrowed, you've created this deficit so what does your body do? Gary Taubes has mentioned this, what your body does is it slows down and gets hungry. So the net effect is zero.

Bret: I think that's so important; the hunger effect is so important.

Ben: But when you release all this fatty acid, you know, after an exercise or this adrenaline kind of thing, your metabolic rate stays high and you know if you have adrenaline flowing, you're not hungry. So there is a whole different response mechanism to high-intensity exercise than there is to supposedly fat burning aerobic exercise.

Bret: Now how about... how the diet impacts that? I mean can you still have those benefits from a high carb diet?

Ben: Sure. So if we're talking about maintaining protein synthesis, which is maintaining muscle, which is anti-sarcopenia, understanding that kind of a concept, all right? There are three ways that you can instigate protein synthesis. One, our amino acids, leucine's a big one, but amino acids, two, our growth factors, and three, our mechanical stress. Now mechanical stress and growth factors do the same thing. So you really only need one or two of those.

So you need your aminos, that's the eating, that's the synergy and we can do the exercise. One of the growth factors is insulin, but as low-carb people we don't want insulin, so forget insulin. Use the amino acid input with the mechanical induction and deformation and stress and you can increase protein synthesis on a ketogenic diet. We don't need the growth factor of insulin.

Bret: Right, but if you... I guess my point is though that you can see benefits whether you're eating low-carb or high carb. Either one is going to see similar muscle benefits, but maybe different benefits for fat loss, or different benefits in another way.

Ben: Yeah, the insulin actually is a growth factor that would benefit protein synthesis. Don't forget, it drives other stuff, other than just sugar or fat; okay, it

drives protein synthesis also. In fact some of your big time elite or grotesque bodybuilders inject insulin, that's how they grow. But in our case, for the 95% of the population, insulin really has a negative connotation with good cause.

Bret: So for someone who has started on the journey of improving their diet, improving their lifestyle, going low-carb and has read all the lines of you cannot outrun a bad diet, so has sort of put away exercise for a little while to focus on diet, how do you recommend they get started with a program like this? How do you recommend to get started with implementing exercise to improve their health?

Ben: Everyone, as long as there's no anatomical problem, now injury problem, and you can work around those, can work all the major muscle groups in their body safely and simply with about seven exercises with bands or-- I'm not a big body weight guy, I think that's another thing...

Some of our colleagues do these stunts, these very difficult body weight exercises, I wouldn't prescribe that to anybody I trained, even my world-class athletes. I think would start to get into Cirque du Soleil stuff, you know. Look what I can do, I can do these pistol squats. Come on, I mean I can't prescribe that to people.

Bret: So too challenging for most people.

Ben: And the skill aspect of this I think overcomes the muscle... the productivity of the muscle work. I mean, you can get it done much more safely and much more simply than that. So the use of some kind of resistance other than the gravity that earth provides for us in our body weight to me is much more benign and simple.

Almost everybody can do all the exercises and the ones that they can't we can substitute and exercise to work that muscle group in one of its functions, so we're not at a big loss, you know. So you work the whole body... again there are local and global benefits of exercise. Locally, insulin sensitivity, you got insulin sensors in all your muscles, why not tax them? You've got mitochondria in all your muscles.

Why not instigate their increase and behavior. We have mTOR production in all of our tissues actually. So all these growth factors can come into play and I think they come into play more globally by working sectionally each muscle group. So I like to work the whole body in one day, then allow the body to recover as a total unit instead of an arm and a leg...

That comes from the bodybuilders and there are a lot of want-to-be kind of guys in our field out that started, you know, they've done some exercise and you can see their abs and you can see their biceps, you know. And you know, good for you, but you're not a bodybuilder, so get off that, okay?

Bret: So what about the people who say, "I want to do this to be healthy, but don't want to get too bulky, I don't want to look big"?

Ben: My answer because this question has been asked to me... This now is the 10,001 time... If you think for some reason you're going to do an exercise and wake up like the Hulk the next day tearing out your clothes, this is not going to happen. So if you get to a point where you are getting too big and too muscular, you call me and you tell me and we'll figure out how to minimize that. That problem happens almost never.

Bret: Good to know. And then what about people who are concerned about hunger? Like we talked about with the cardio exercise, it can fuel hunger and you sort of give yourself an excuse to eat more. And with this type of exercise, you said it doesn't stimulate hunger as much, but you find psychologically people still use it as a crutch to eat more?

Ben: We can go into behavioral and psychological stuff and we would have another 300 hours of interview, but some people say, "I exercise so I can eat", which is stupid. I don't know how else to describe it, but physiologically-- And don't forget now high-intensity exercise has effects on leptin, ghrelin, I mean it has these effects and there are plenty of studies that it affects-- it actually reduces leptin levels, I mean this is are good things that happen.

And then again if we don't vacillate in my opinion blood sugar levels, which are going to have these spikes and drive hunger, which again if you're more insulin sensitive but through this muscle work, it serves as almost a panacea for a lot of the exaggerated symptoms of hunger.

And even understanding if we control leptin not only do we control the signals of hunger, we control the psychological hunger. I mean that there are two separate and distinct mechanism that leptin instigates.

Bret: Also leptin helps you feel full, so you would want sort of more leptin to be--

Ben: Don't forget, you can become leptin resistant and then we start to get into dynamic range of substances, of molecules. If you have a high level of fasting insulin and you take a bolus, you take in an imposition of glucose and say it takes 20-- 20 level-- of insulin to adjust to that. And your basal level is 18, you do not have the dynamic impact of someone whose basal level is 7 or 8.

So it doesn't really affect, that's what you're insulin resistant, because the dynamic range is minute. Somebody who is down in seven or eight give, you give them something that requires 22 level of insulin. They are going to get a good bang out of

their buck from that 22 because the dynamic range is important enough for you to get a significant response. So that's another issue, this dynamic range concept. And in leptin is pretty much the same way.

Bret: Well, interesting, I think it's a fresh perspective that people need to hear because we are so-- we repeat the phrase so much, you can't outrun a bad diet, because the cardio exercise is not the best way for weight loss and it's important that we realize that. But then also important to hear your side that wait, there are other ways to exercise, we can do this better to still impact our metabolic health, to improve our overall health and work synergistically with a low-carb diet.

Ben: Synergistically, big word, but that's really important. More bang for your buck.

Bret: I really appreciate the message and I'm glad that I had you on today to kind of help our listeners understand this and give them a little bit of a framework to how to get started with this. So if people want to learn more about this system where can they find you to hear more?

Ben: Dr. Benbo.com I believe. I'm not a big website guy, but I have all the information there where they can contact me. I take phone calls, emails from people and I enjoy it. I have enough spare time that I can get through this. Forgive me if I don't get back to everybody right away on emails because we are starting to get a whole bunch of stuff going on.

Bret: I bet.

Ben: Yeah. And it's fun, I would certainly like to help. And they can come to these conferences, I mean, you and I did a private conference which was really cool low-carb conference. I am going to speak a number of things now and I am on some podcasts.

Bret: Great, thank you for your passion and thank you for your message.

Ben: Always good to see you, Bret.

Bret: You too, Dr. Ben.