

Tom FDP

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SPEAKERS

Michael Nelson

 Michael Nelson 00:00

Hey, it's Dr. Nelson, welcome back to the flex diet pod cast, where we're focused on increasing your performance, better body composition and all without destroying your health, even increasing your longevity. Today on the program, I've got an interview with my buddy Thomas Phillips. And we went kind of all over the board on a whole bunch of different topics he wanted to pick my brain on. So big thanks to him. Everything from metabolism, to heart rate, variability, glucose monitoring, using a continuous glucose monitor, and much more. As always, this is brought to you by the flex diet certification, go to [flex diet.com](https://flexdiet.com) FLEXDE t.com you'll be able to get on to the waitlist there. That will also put you on to the semi daily newsletter. I've got some great stuff for you. And we'll leave it as a mystery. Something I'm doing only for newsletter people coming up, I think you will enjoy. So go to [flex diet.com](https://flexdiet.com). And enjoy the podcast today with my discussion with Thomas Phillips. So

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first of all, Mike, thanks again for taking the time to do this last time. No problem, man,

 Michael Nelson 01:31
I appreciate the questions.



01:33

Yeah. So just real quick, because I just want to give a quick overview what we did last time, we talked about heart rate variability in the whoop system. And since we spoke, I am now 100% pretty much positive that the HRV that whoop uses is in fact an algorithm that it's not actually measuring.



Michael Nelson 01:56

I did confirm that for the most part two, I talked to Joel Jamison.



02:01

So um, you know, the, which is disappointing, had I known that I wouldn't, I would have never invested in it. And just so you know, I mean, I don't know if we went over this last time, but ever since COVID. Started, I used to do what's called the ultimate transformation challenge. And I go through, you know, very comprehensive nutrition program. But when the COVID started, I didn't have access to the gym, obviously. And I started to do what are called 40 day challenges. And I figured you know what, let me start with the immune system. And for 40 days, I did 20 minutes on the immune system. And then people love that. And we wanted to have more information on this and then that. And so I decided, you know what, I'm going to start doing these topics. And obviously, the last one was HRV. So I wanted to let you know that this one we're doing I was actually able to get constant glucose glucose monitors. Oh, nice.



Michael Nelson 02:53

I just got a guy from Germany on that. So, so this one right here is by Abbott Cristo. Yep, exactly.



03:04

So I have 20 people doing it with me, I won't be able to get these things. But I haven't started it yet. And I didn't start again on purpose, because I actually wanted to get your thoughts on this tell you what I'm thinking and just do it better based on your feedback? Yeah. So here's so here's some of my thoughts, what I'm looking for with it. Obviously, I think the average person will find to probably type two diabetic. That's the first thing. But um, but more importantly, just how the perception of what's quote unquote, healthy food for some people might not be so great for others, and specifically, when it's carb based, I

have noticed myself, that's I react much better to certain carbs than others, even even, you know, supposedly good. And just in general, I wanted to talk a little bit about obviously, the benefits of keeping a healthy blood sugar, but then, you know, when it when it is advantageous, say post training to put in some, you know, to spike your glucose and therefore insulin and whatnot. So, any thoughts about what I'm doing here, Mike, what do you think of this endeavor? And what I'm looking for? Is there anything else that you'd be curious to see from the experiment? Yeah,

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Michael Nelson 04:27

I mean, one, I'd love to see the data. I think that's super interesting. My bias and how I've set it up with people is, the new ones are 14 days. So my bias is to split it into two weeks. So I tell people take the first week, don't change anything. Ideally, if you could not even look at the data until you've completed that week. Even better, because I want a nice snapshot of like, where your baseline is, what you're doing what's going on, obviously, log Your food with your timing your exercise and some sleep. So you can go back and look at it and see what was going on. Because the biggest mistake I see with people now that they can get access to the readers and everything is they do one day and they look at it and they start freaking out and they start changing 1800 variables, and they get so confused by day four, they don't know what end is up. And as you know, like it can change based on sleep, it can change based on stress the food, there's a whole bunch of stuff that goes on. But the main question you want to answer at first is, what was my baseline and what was good and what can be changed? So then at the end of usually that seventh day, I'm like, Okay, let's take a period of time, let's look at your data. Let's just look for associations, just like HRV you know, oh, wow, it looks like you had three nights of poor sleep. And it looks like the next day wasn't as good. Or, wow, I had white rice. I thought that was a quote, good food, my glucose was high after. So this will give you I usually have people start with like two to four little experiments that they would then want to run. Right? So it's like, Okay, if I sleep more, does that look better for the next week? Or what are like the three foods I kind of want to test? Right? Let's say white rice is one. So then I'll say, Okay, take a morning time, because it's going to be a little bit more stable. And as weird as it sounds like, just eat a shitload of white rice for breakfast. Yeah, right? Because that's gonna be the most stable period of time. It's in isolation is a kind of an artificial thing. Yeah, absolutely. And then see, are you able to reproduce it? If you are? Okay, then then you can play around with what you want to do to modify it. So I do the second week as modifications and testing the extremes.

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06:52

Yeah, I love it. I that's actually a great idea. And what I do like about whoop, though, is

that they, it's actually very accurate at tracking the sleep.



07:01

And it's not bad for sleep actually.



07:03

Not bad at all. So I like the idea of combining obviously, we talked last time about Matthew Walker and his work with sleep. And he's talked extensively about how Poor Sleep Affects blood glucose along with many other things in your brain, but but that's awesome. So some of the other things I'm planning on discussing during that challenge are basic things. I don't know if you've heard this research that apparently just a 10 minute walk after you eat is as effective as Metformin Have you heard this?



Michael Nelson 07:35

It can be in some people. Yeah. Cuz you know, non insulin mediated disposal basically.



07:42

Yeah, yeah. basic things like, you know, in terms of like having some protein and a little bit of fat with your carbs, just basic stuff that I think people don't realize how, how simple it is to kind of mitigate some of these problems that you can have with insulin response, you know, do you have any other suggestions as far as how people can other than sleep and exercise is totally and, you know, combining protein and protein and fat, any other little tricks that you found that map onto glucose that maybe aren't as well known?



Michael Nelson 08:19

Yeah, so there's a couple things. Movement is a big one, right? So most people are familiar with if you get in the weeds, like the, the insulin mediated uptake of glucose, right? So insulin causes a glucose transporter to go to the end of the cell, it sucks in a bunch of glucose. Most people are not as familiar with like you talked about walking, the non insulin mediated uptake. And there's some studies showing that that that may actually be a bigger portion. And all that is is just simply muscle contraction in and of itself, independent of insulin can actually start pulling glucose out of the cells. So like going for a walk in the morning, going for a walk after meals, do you have some insulin release? Just muscle

movement? Because I think and John Berardi said this years ago, he's like, all these people say they're active. He's like, yeah, you you train hard for 45 minutes a day. But then you sit on your ass for the rest of the day. That's good. Training is good, but movement helps to. Yeah, we talked last time about how important need is right now. You know, taking the stairs instead of you know, going up the escalator and purposely parking further away in the parking lot in order to get more steps in just this base. You know, I promoted a standing desk forever to people. Be weight bearing on your hips, find ways there's even stuff with people that fidget right that they find that you know, so. So great. That's great stuff. Another couple things I would add to would be there's some very interesting stuff with where the spike occurs in the blood glucose, right? So if I see someone who and again, CGM is pretty good at measuring interstitial. But if you see someone who spikes super high, and then it drops super fast, and then you've got this longer kind of tail to it, there's two main phases of insulin release. The first one is this a phallic release, which is primarily modified by your nervous system. The rest of it the kind of standard insulin response as people think of it is more related to the hormone insulin itself. So if I see people who have like this really big spike, and then drops and still is a little bit of elevated, my thought is, maybe there's something going on more with their nervous system. So I'm gonna ask them like, okay, where do you eat? Oh, I'm a trainer I'm eating while I'm running to my next client. Right? Oh, so you're eating in like a very stressed out state a lot of times, or you're watching something stressful on TV versus? Yeah, I decided to eat outside and stare at a tree. Okay. You know, it's more on the theoretical side. But I think you'll see different responses to that. And we know if you get stressed, right, you're just gonna start pulling, you know, blood flow away from your gut and that type of thing, too. So sometimes you can parse out that up to Yeah,



11:18

I mean, what isn't debatable, we spoke about this last time is that your parasympathetic system really is your rest and digest and right, when draining, you really are very, very sympathetic. And you're, it's the opposite, right? Your, your blood flow is everywhere, but in your stomach, it's paying attention to everything, but digesting. So that example of training as a stressor is great, because everybody can relate to that. But your point, just emotional stress, right? You're gonna work difficulty digesting and under emotional stress, or, again, to your point lack of sleep, if you only had two or three hours of sleep. That's a type of stressor. So I like that. Um, is there? Is there anything else you could think of? Before I kind of delve down a little bit more, I want to I want to talk a little bit more specifically about insulin as well.

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Michael Nelson 12:08

Yeah, my mother, like how aviat is, it's you probably are have coming up is that we're still only looking at blood glucose. And that's good. And that's a really cool window. But like I did a study that was long story short, it was a year and a half of my life and never got published, which is a whole different story. And we were looking at people that were borderline type two diabetic, we were looking at if you know walking was an intervention, we didn't really do a timed or anything like that. But we had people walk, didn't walk, we pulled blood glucose, we pulled insulin, we pull all these bloods off them. And when you go to run it, like blood glucose is very easy to get. But the insulin data takes a little while to come back. So initially, I had all these people that had all their blood glucose, and they're borderline type two diabetics. So they're definitely kind of uncontrolled. And like, yep, that person's high, that person's high. And then when I got the insulin data back, like some of the people who were high, but not crazy high, their insulin was sky high, compared to other people where it wasn't, right. So the person with the sky high insulin is definitely closer to a diabetic state, but their body is able to compensate and kind of keep blood glucose a little bit lower by putting out a massive amount of influence.

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13:24

Right. So So this is sort of part of where I wanted to begin this conversation. And you can, this is what i, this is what I understand. And you correct me as I go along. Sort of like as, as blood glucose stays high over time, right? Somebody is not eating well, and they're eating, you know, refined carbs, lots of sugar, blah, blah, blah, and it goes on every time. Insulin will raise precipitously with that. Right? My understanding, though, is that eventually though, right, as the blood glucose goes up, insulin comes up with it. But eventually, whether it's six months, a year or two years, the insulin actually starts to come down. And eventually you can have a very normal looking insulin with high blood glucose is have you heard this?

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Michael Nelson 14:13

Yeah. So what happens is, imagine if one line is insulin and your other line is glucose, right? Because your body goes, Hey, I have to control blood glucose as tight as possible. That is the main thing, no matter what it's obviously beyond insulin, but the whole system is set up that if blood glucose goes way too high, it's very toxic. Now again, does that normally happen extremely rarely, but your brain goes, Okay, we need to dump it somewhere. We need to convert it into fat. We have all these other counter regulatory hormones, blah, blah, blah. But if we just look at glucose and insulin, you're correct that blood glucose can go up and the insulin can start going up. And what you'll see is the two curves will start

becoming disproportionate glucose is going up and you Insulin starts rapidly going up, you'll see this inflection point in the curve. But then at some point, especially as a bright gender, like type two diabetic, oh, now you've actually started having the problem with insulin production, right? The cells that produce it start having issues. And then your correct insulin production starts going down. The body says, Hey, man, we're putting it out as much as we can, we're actually starting to have damaged the cells that are producing it. And we just can't put out any more, we're actually starting to go backwards now. And at that point, blood glucose starts becoming really uncontrolled.



15:35

Yes, sir. Yes. So so that's really the problem. I think people get this idea that, you know, this is something that happens, you know, in a short period of time, but it actually takes a little while,



15:48

that many years actually.



15:51

Yeah, years. Yeah. And once that happens, you know, your people don't realize, I mean, you've actually caused, you know, problems to your pancreas, your liver, you know, there's your your liver enzymes are likely high, overall, unhealthy situation. But the good news is, is that we can reverse this right, most of the time, this is very reversible. And people that I've worked with over 20 years, I've seen this reversed in about three weeks, meaning like, you start to see very normal blood glucose, that's people that are being vigilant, you know, they're they're right on point, they're doing what you asked and moving their bodies they're doing, you know, they're getting enough sleep. But in about three weeks, you can see this crazy change in their body and in their blood glucose. And part of that is because your body is just so rapidly, you know, turning things over so quickly, right? Yes, you may still be 5060 pounds overweight, but you've created an environment in the bloodstream itself, where it's much more conducive to, you know, a healthy lifestyle. Is that accurate? on your end, Mike?



Michael Nelson 16:53

I would say so, I mean, the time course is probably debatable, and there's a lot of variability in it from what I've seen. And the part that we don't necessarily know is we do

know that if you get really far into being a type two diabetic, you probably have no other choice than to be on some type of insulin route. Again, if you can make your body very healthy, very sensitive insulin, you may not need much of any and some of those people were finding that we thought would be on insulin the rest of their life, they can probably come back a lot closer to healthy than what we thought before. But either way, the interventions or what you're gonna do are going to be the same, right? You're still gonna do all the things we talked about where you end up, you know, that's kind of debatable individual, but the action items and the stuff you would do is all very similar.



17:43

Yeah. I mean, if a person was willing to be completely ketogenic total beta oxidation pathway, they really wouldn't need insulin, right? Even if they so if they were type two diabetic, and were insulin dependent, right? If they were willing to go completely ketogenic, you you would agree that the the insulin would be pointless.



Michael Nelson 18:04

Maybe it depends. The tricky part with that is, I have a buddy who will remain nameless, but he's a PhD. And he is a type one diabetic, right? So he's got he doesn't produce any insulin. I do not recommend anyone do this experiment. But he went completely ketogenic, and for periods of time, he cut his insulin like dramatically to almost nothing. Now, again, I would not recommend that to anyone. The, the issue is that if you have absolutely zero production of insulin, you can end up what's called diabetic ketoacidosis. So insulin, even in tiny amounts will cross check how much production of ketones gets spit out of the liver. So in English, that means if you're a healthy person, and you do a ketogenic diet, the amount of insulin you're producing dramatically goes down, but you still have a little bit that's being produced. And that little bit that's being produced prevents ketones from going dramatically high. So if you're healthy, you can't ever really run into a problem with too high ketones. Now, if you drive that insulin production to absolute zero, then you could end up having an unchecked production of ketones and you can end up being what's called diabetic ketoacidosis. So that is a real thing it can happen. But again, that's some people who are very advanced disease state. Most people who are healthy wouldn't have to worry about it, but the amount of insulin even in that case goes down dramatically. That was a type one diabetic though, right? Like that's if you drive insulin to absolutely zero, correct Yeah,



19:50

but that the the example you just gave though, your friend was a type one diabetic.

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Michael Nelson 19:55

He was the type one diabetic, which is why it's tricky, but He also, I mean, he's actually spent seven years of his life studying this in a lab. He's lived his whole life as a type one diabetic. So he's pretty good at knowing what's going on with his body.

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20:13

Yeah. Know what I mean is is I'm saying, I'm saying specifically for a type two diabetic?

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Michael Nelson 20:19

Yeah, so type two diabetics, most of the time, they do have some insulin production is probably not sufficient. And if you do have some insulin production, your odds of you know having a super high ketone production, probably unlikely, because even that tiny amount of insulin production even in a healthy person, that's enough to present the ketones from going just through the roof. So most of the time, they're probably going to be okay.

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20:45

Yeah, yeah. Yeah. Perfect. Perfect. Yep. I mentioned earlier in terms of, you know, just combining foods in order to keep your blood glucose, you know, at a steady keel, terms of fat protein. fiber. Yep. Let's talk real quickly about protein. I know you did a lot of I mean, I've listened a lot to Dr. Stuart Phillips, as well. And I think, yeah, you've done quite a lot. And I think that you could say to people who are listening, that if you want to know about protein, he's probably the man right?

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Michael Nelson 21:24

Oh, yeah. Yeah, he's definitely I mean, his lab has done more protein research in terms of tracer studies. There's like a handful of like, six labs in the world that even do that kind of research. So

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21:36

yeah, yeah. So what I wanted to address with the the audience listening, because I think this concept gets very hard for people, hard for people to understand, but I'll tell you how I sort of look at it in this context. So people hear this idea of like, Oh, you know, what, I want to get big, and I want to get strong, right. And I want to put on as much muscle as possible, and I want to perform great, but at the same time, I only want to eat one meal a day. Because you know, that's supposed to be really good for you, I read that somewhere. And then I'm also going to be ketogenic as well. But I want to, I also want to be able to, you know, deadlift 500 pounds and benchpress, 300 pounds and go through these workouts that are 45, two minutes to an hour long. So the way that I look at it is like, sort of, like on that mTOR pathway, right? Like, you can either follow a lifestyle where you're on one extreme, that's designed to like preserve things like to live to be 120. And in this case, you know, yes, eat meal, one meal a day, you know, make, obviously, you know, you're still gonna do all the things that we talk about, but you're not necessarily going to drive your body the way a powerlifter would, and things of this nature, you would do things that are, you know, more in the, in the line of, you know, walking yoga, breathwork, things like this, this is great, you know, but if you're going to if your goal, right is to have a lot of muscle, and to be able to have these crazy workouts, not just in terms of what we're going to talk about protein, but just in general, it's probably a good idea to eat more meals a day, and to obviously follow all these lifestyle rules. But I think people get very, very confused in the world of, you know, health and wellness about these topics. And it's because they don't understand what they're trying to do. They just read things that are quote unquote, good for you. But yet, we're a result driven society, and we want to be able to do things. And unfortunately, sometimes these goals don't go together. So can you just speak briefly about that, Mike? If, if I'm on the right, track your one on this?

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Michael Nelson 23:39

Yeah, so a couple of things. So if we look at things that promote longevity, right, so things that we have pretty good data that support lines every muscle mass, lower body strength is probably at the top of the list, right? Your ability to get out of a chair, get up off the floor, don't break your hip, all that kind of stuff is related to muscle mass, especially lower body full body strength, vo to Max, how big is your aerobic engine? How well can your body process oxygen? grip strength is also a correlate there. The grip strength is probably more just an indicator of full body strength again, yeah, as you know from lifting, right, I've I've never met someone who has a really strong rep who is a weak person, right? And I've never met someone who's really strong that has just a horrible grip. But did they're just they're high associations of each other. Yeah. If you get into theoretical stuff, yes, reduction of calories may help. I say may because it depends upon what you look at. You know, if you're a friggin nematode, you know, it's like 40 to 60% of just slashing your calories. If you're a mouse. Yeah. 30% if you're a primate if you're a human, maybe even

one of the main primates though. That was done, got hosed up because one of the people in the lab felt bad for the group that was being calorically restricted and got busted for secretly feeding them. You know, so even the data we have on that, I would say is highly debatable. So in general caloric restriction, yeah, you want to be good body comp, you don't want to be obese. That definitely helps. But restricting calories further from that is hypothetical. In terms of protein, same thing, right there, yes, you can find all sorts of mouse studies showing that protein may increase cancer risk. But again, as you scale up to actual humans, in terms of potential risk of getting cancer, I'm not super convinced by that data. And again, I'm not a cancer researcher. And then when you look at the literature, you have to differentiate from people who are reducing the risk of getting cancer, versus people who already have cancer. Those are like two completely different mechanisms. So there's some mechanistic stuff that some types of cancer, if you already have it, and you are being treated for it, protein may or may not be the best idea. But that does not necessarily translate into, oh, I need to have less protein, because I'm want to reduce my risk me, I thought a little bit more hypothetical. So my bias is if someone said, Hey, I want to maximize longevity, I want to do it on what data we have. Now. All the things you said are great breathwork reduction of stress, sleep, I'm biased, more towards three to four, three to five protein feedings per day, most days, if you want to hedge your bets on that side, a lot of people do one day of just not eating right. So take Tuesday, work up and just do a long, fast, don't consume any amino acids. probably good for body comp might be some other benefits, it's probably yet to be determined. And if you really want to hedge your bets on that side, that's probably what I would have them do the other six days of the week, by all means run em tour, lift heavy stuff, like bias yourself into function as best you can.



27:12

Yeah, and my clients know that that's exactly what I do that, that I do one day where I do. I don't eat until three o'clock in the afternoon, right? So, my the night before, I'm done eating by about five or six o'clock, so I go about 22 to 20 hours of not eating and a lot of my clients have done that with great success. You know, just you know, one day we so long the topic of protein, and I brought up Dr. Stuart Phillips, for this reason. Can you explain to everybody, this idea, and I brought up that one feeding a day, right? So right, we'll get to it like, but I thought you can only absorb 20 grams of protein, you know, if I have to get all of my protein, I'm supposed to eat my body weight and protein, right? What up? People are reading, right? And because I want to get big and strong. And I hear that one feeding a day is really good for you because I read it or listen to Rhonda Patrick or whatever. Can you talk about the what what is meant by we absorb 20 to 25 grams of protein at 25. Certainly on the high end. And true truthfully, though, like wrap it up by explaining to people that all of the protein is eventually absorbed. Right? And what what

that we mean about this 20 grams of protein window absorption?

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Michael Nelson 28:34

Yeah, so that's one of those myths that gets thrown around all the time and still around. So I tell clients is like, okay, Hey, man, have you ever gone out to like a big restaurant and you get like a 16 ounce t bone? You have it for dinner? And you wake up in the morning? Do you take a crap and have like a T bone shaped poo like the next morning? Like does it just go right through you? Because you can't absorb more than like 20 grams of protein? Like, no, that doesn't happen. Right? So most people absorb it, it gets used it gets broken down into amino acids, no matter how much protein you take in. Now the caveat exactly what you said is people that are thinking use versus digestion. And normally when they think use they're only thinking about muscle use. So it is true that there is a cap to Maxi now what's called the protein synthetic response. So how much protein Can I take in and in English, just jam it into my muscle tissue only right because that's it most people care about? Yeah. With that the maximum dose is 20 to 40 grams. So if you look at like whey protein, you can take 20 grams of whey protein, this is a young healthy subjects on a fasted and you could double it you can take in 40 grams of whey protein, the net response of how much ends up in your muscle tissue is still the same, right because 20 grams of protein will kind of match out that response. It's like turning on the light switch, right? Once I have the light switch on, if I put more pressure on the light switch, it's not going to get brighter. It's not a dimmer switch, it's an on and off old school switch. If you are older, however, you may need 40, maybe 60 grams of protein to get that same response to someone who's younger. I think it was Tang who did a study comparing 20 year old individuals through those who were 71 years old. And what they found was a 71 year old to get the same acute response needed 40 grams of whey protein compared to 20. So the dose seen as you get older, because of something called anabolic resistance actually goes up. And then if you get into like rice protein versus way, like if you want to get about the same response, it's about 40 grams of rice PROTEIN ISOLATE, because it's not quite the same quality. So that's the main difference with that. And a super cool note on that. So Luke van loons lab in the Netherlands, they actually did a study with radioactively tracer labeled protein, it took them three years to get the protein. So what they did is they actually had to get cows, and they put the tracer in their feed, and they fed it to the cows. And then they had a monitor the cows, they took the milk from the cows, and they made protein, they gave it to individuals in a study via nasal canula. At night, they literally jammed it down their nose. And then they woke them up with like muscle biopsies in the morning. And what they found was because it was a radioactive labeled tracer, you can literally trace the amino acids in the body, what they found was a 20 gram dose of whey protein, only two grams of that actually got deposited in muscle tissue. So it's a very inefficient type response. But if you add that response up over time, so back to your one

meal a day, if I only did one meal a day, I'm probably gonna max out around that two gram deposit of muscle. Now, if I could add another, maybe two feedings, I could triple that. Now, again, still very small amounts, but that will offset the amount of muscle mass that people will generally use with aging, especially if they're not training. So having multiple feedings, especially as you're getting older, is going to be more beneficial.



32:26

Yeah, absolutely. I mean, you know, you mentioned, you know, the absorption protein, you know, as far as like foods, you know, eggs would be highly absorbable, you know, even more so much more so than whey protein, which a lot of people perceive as you know, super absorbable, I think whey protein, it's more the fact that I think the concentrations of leucine are so much higher, right? So the, so the signaling is so much is there, right? Maybe you could talk a little bit me about like, leucine, how sort of branched chain amino acids are a waste of time, right? I mean, like, we used to think in the 80s, that this was a big deal. But you didn't know leucine right to drive the deep the protein, the signaling, right?



Michael Nelson 33:10

Yeah, so the main thing of how it works is you've got just like your bank account, I can put money in, I can take money out, but I'm looking at the net response. So muscle protein synthesis is I'm adding more amino acids to my muscle and making it a little bit bigger muscle protein breakdown, as I'm pulling out amino acids, and it's going down, just like I'm withdrawing money out of my bank account. And at the end of the day, we want more to be put in and then we want to be taken out. And in studies, it's like two labs in the world that only really measure muscle protein breakdown. So it's hard to measure, but most of the what's variable and under our control appears to be more on the building upside. Again, that's still a little debatable. So when we have protein coming in, the two main things that are going to trigger that muscle protein response is going to be leucine, and then essential amino acids. So leucine real simply is like turning on the assembly line. So imagine I got my assembly line here. And I'm gonna make a bunch of stuff. Right, so the first thing I need to do is I need to turn the assembly line on, I need to get the thing running. So leucine is the main thing that sort of turns on that muscle building process. The second part is I need some raw materials to make stuff out of, right, so the building blocks are the essential amino acids. And then the last part, if I really want to crank it up, I need some type of fuel, which is like as you know, if you really want to add as much muscle as humanly possible, you're going to need to be in a caloric surplus in order for that to happen, you just need more energy to run through the system. So when you have those all three, then you're good. Now you can still add some you know muscle if you're not in a massive caloric surplus because of the training and everything else. But you mainly need

leucine and you mainly need essential amino acids. So We look at branched chain amino acids, they fulfill the leucine requirement. So there may be some slight benefit to that. But if you don't consume them with any essential amino acids, you're missing the raw building blocks. And you're gonna see, you know, very much of a subpar response.



35:18

Yeah, I mean, my point was that more leucine isn't the answer, right? You just read enough in anything more than that people think well, memory slam, you know, five grams of leucine. Because apparently that's that, no, you just need enough to start the assembly line. That's,



Michael Nelson 35:35

that's really the it's a, what they call a concentration or a threshold effect. Right? It's about two to three grams of leucine, depending on what animal data and what models you use somewhere around there. You're correct. So once the assembly line is on, it's on and it's running, right? So if I take eight grams of leucine, it doesn't run any faster. Right? So once you've hit that threshold, like turning the light switch on, once it's on, you're good to go, you've already accomplished it, adding more isn't gonna make the light any brighter.



36:06

Then like, you know, like how, like, just hypothetically speaking, if somebody did shake, chain, take branched chain amino acids in the morning, right? How, what's the half life of leucine in terms of how long it can sort of keep that window open for the next meal? Like, you know, let's just say hypothetically, your next minute, you didn't have enough leucine to, to trigger that assembly line. Do you know if that first feeding in the morning, four hours prior? Do you still have enough leucine in the system for the second meal,



Michael Nelson 36:35

I would have to look at the actual kinetics on it. But if I were to guess, I think it's only like an hour or two, like freeform leucine spikes really fast and then decays pretty fast. There's some super interesting data, I was just at the International Society of sports nutrition this past weekend in Florida. And Dr. David church was presenting, he's one of the guys who works in a lab that does Bob both lab that does a lot of these tracer studies. And they were showing that even a greater acute response with essential amino acids fasted even

compared to wait, meaning that if you compare essential amino acids to way more of them show up in the plasma and get to a little bit higher rate acutely in people. Now, we don't know does that translate into more muscle mass Are not we haven't really done a lot of those chronic training studies per se. But we do know that essential amino acids do show up faster. And I think in the future, to your question, we might be back again to the kinetics question of how fast these things show up might be more of a factor than what we think. But again, that's also down in the weeds, and you're splitting hairs. So if someone said, Hey, I really want to hypothetically maximize my muscle response, I'm already getting the amount of protein that I need. Was there anything else I can do? I'm already training hard. My sleep is good. Hypothetically, you could say when you first get up in the morning, you know, consume. And there's studies up to even 15 grams of essential amino acids first, and then maybe wait a couple hours and then have a normal meal kind of go by you know about your day. Yeah, and hypothetical at this point. But we do know that that does trigger that process via the high levels in plasma. I just



38:27

want to be clear that it's to people listening, because I know that this may be confusing to some people, but essential amino acids are not the same as branched chain. Correct? Correct. So I don't want people to go think that we're talking about brands right. So perfect, perfect. And then just in terms of just a general overall, kind of wrapping up the whole muscle building thing. I don't know. Are you familiar with a lot of the theory with Myostatin being like one of the main drivers of the rate limiting like, also somebody can build there seems to be like crazy evidence and in you know, one direction and then there's others where it's like, well, maybe it's not this I'm just I just was curious of your of your thoughts on this because they have that I think it's those those those oxen that are like those, have you seen these these Belgian blue?

M

Michael Nelson 39:23

Double, no Myostatin knockout? Yeah. So can you give me your thoughts on this? I'm curious what you think. So the thought is that Myostatin is one of these sort of breaking things that doesn't allow you to accumulate a lot of muscle, right? And we do know from like the Belgian bulls, which are what they call a double, no myosin knockout, meaning they just, there's two genes that code for it and you just, you just whacked both of them out. Right. So you took the break on muscle growth and just pulled it off entirely. In humans, that's really rare. I think there was A kid born in Germany, there was a double Mio stat No, I think, and you know, large amount of muscle mass. But there's some debate on biopsy studies that the muscle isn't quite as functional as what we think it's bigger in size. But the strength doesn't compare to quote, normal muscle. There's some interesting so

the US like most of this research was from de Shane's muscular dystrophy, looking at dystrophin molecules. And that's kind of how it got started. And there's even some debate with some of the genetic models that in humans, if you could really get someone that's double Myostatin? No, would that be an advantage, and it's really debatable, supposedly, like Flex Wheeler is like a single mile set? No. So the new thinking is that maybe we don't want to remove the brake entirely and throw it in the trash that maybe we just want to pull it back somewhat. And my gut feeling is that I don't know if we'll be able to without direct genetic engineering, because the amount of like, the longer we keep looking at muscle hypertrophy research, the more we just keep coming back to that it's this multi domain, like super redundant type system. And I just talked to Mike Roberts at ISSN. When he reached out in there, I talked to him and Les Norton, we had this hour long conversation about hypertrophy and punish and angle and all this stuff. And it just seems like some of the theories like the myonuclear domain theory where the little nucleus for it can only allow the muscle to get so big. The newer thinking says that may not actually be true. Even the models of what we had the actual fibers and how they arranged in three dimensional space, there's some super cool electron microscopy where they've done it in three dimensional modeling. And like the microtubules, and all these other structures are probably more important than what we thought. So all that to say is, I think it's definitely a factor. But how much of a factor? I don't know. It has out like direct genetic engineering that it appears we don't have a lot of control over it. And if I did, it might be not the best.



42:28

Yeah, I bring it up, Mike, because I want people to understand, uh, you know, I'm going to I'm going to go down a couple more things. Yeah. There's we're not we're in a society right now. Fortunately, where kids are very influenced right by Oh, yeah. So yeah, they just they want to get big don't want to get jacked, and I hear things right. And there's all these things that we're discussing about protein and muscle and that they're just not thinking about right I brought up the whole end Poor thing. You know, you hear this is good for you. But that but I want to do this too, because I heard this and your goals aren't matching up with what you're trying to do. Myostatin I'm saying is clearly a genetic thing. Right? So for for so there's a component there that's clearly genetic. The other thing is you brought up Flex Wheeler, those who don't know flexor was one of the greatest bodybuilders of all time in the 1990s he looked like he was going to surpass Dorian Yates but a lot of that being Ronnie Coleman, so Flex Wheeler so from that experiment, I don't know if you saw this that they did a whole bunch of Olympia competitors and it turns out these anomalies were not as common as they thought. But that brings me to my second point is that some of it is just the androgen receptors right some of it is some people just have unbelievable androgen receptors on this and especially those you know, people are taking anabolics

they're just they're just unusual responders to anabolic so when you're when you're looking at these guys and again, like you know, I hope you're on board with what I'm saying here in professional sports, they're all on drugs like you they're all on replacement testosterone, they're all you know, at 200 250 you know milligrams a week yeah, you know, they're not taking 500 MLS with the anadrol and everything else that that these other guys are doing, but these guys are all quote unquote maximizing their testosterone levels you know, you see these guys and all you have to do is go back and look at them. You know, my old baseball cards and Barry Bonds and mark you know, one Gonzalez and all these guys in the 90s I have been lifting weights my entire life my entire life. Okay, I am still 180 pounds. Yes, I can benchpress you know, 320 and yes, I can deadlift 550 s but I am 180 and it's not because I'm not trying to put on muscle. Yeah. That point, Mike, you know, just along with Myostatin, there's just other factors in the receptors itself with androgens and if you're taking anabolic some people are just hyper responders. I'm mentioning this again, because there are so many parents with kids who are so influenced by things. And now these kids can get things like sarms and get things, you know, peptides like right through the mail. And they don't they think that they're taking like a supplement when they're what they're actually doing is they're crushing the test their natural body's ability to create testosterone, at the very least, right? So that's why I bring these things up. I know that was like, kind of a long rant. But any any thoughts you have on that?

M

Michael Nelson 45:30

You know? Yeah, no, I, I agree. And there's a huge difference between even if we take testosterone, right, so huge difference between natural production of testosterone, and even using what's considered now a small amount of, you know, external testosterone, right steroids, like the you end up being in what's called the super physiologic range relatively fast. And again, that's highly different, depending upon the individual depend upon their androgen receptors, depending upon how they tolerate side effects, how they tolerate everything else. Some people are just more responsive period, like even look at, like Ronnie Coleman, before he ever used any extra supplements. He was a freak, like, look at pictures of Lee priest when he was 18. Like, what the hell, I mean, these guys were the outliers, the freaks of the freaks, before any of that, you know, and I think that's the part that people don't realize, either, especially with high end athletics, that doesn't is not to take away from, you know, the work and everything that they put into it. It's just, there's some people that are genetically or whatever things we don't understand just quite different.

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46:43

Yeah. And that's, you know, that's what I want to drive home, you know, for parents

listening, you know, for because there's so many kids right now, Mike, I'm telling you, I've been doing this for 20 years, and in the past five years, I have seen two ends one is either the kids are getting super super heavy, or they're like way overtraining and getting super obsessed. Super OCD and, and going nuts with things and I and you know, that you're trying to take every supplement every pre workout every Yeah, it's we're in as a society right now, where like, nobody can just be in the middle and bothered to learn something like learn it, right? It's everything being promoted to you are listening to, you know, the easy ways out, understand, what are the genetic factors? How does protein work? What about sleep? What about training itself? What about, you know, how often should I eat? What am what am I actually trying to accomplish? And is what I'm doing, getting me there? Is that the best way? Because, like I said, My concern, and what I'm seeing is how accessible, these things are to kids. And they're doing like, you know, you know, rad 140 and all these like crazies sarm things. And they think like they're taking a supplement, it's like, No, you are early, taking away your body's own ability to create testosterone, and you're crushing it. And if you keep doing it, you know, there could be, you know, long term problems, you know, hypogonadism and, you know, how reversible is that over time? I mean, you know, as some of the professional bodybuilders that are now on testosterone for the rest of their lives because of what they did to themselves earlier.

M

Michael Nelson 48:27

Yeah, I mean, I know a couple professional bodybuilders, I want to say their names, but the handful of ones I know who's like legitimately competed on the Olympia stage. All of them are on HRT, because they said they tried to go off one guy in particular, he's like, I didn't want to be on anything. It's like I stopped competing. I didn't want anything to do with it. It's not part of who I am. This is transition everything. He's like, I just have no production like zero.

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48:56

all heard about it on Joe Rogan. Yeah. You know, how different his body looks now. And he just says, you know, look, man, I have to take you know, exogenous testosterone because I just can't make it anymore. Yeah. And so, um, yeah, so again, I just want to take away to be look, take the time to learn, understand, if you want to build muscle, there's actually these check marks these boxes that you have to check off and understand. Let's talk a little bit about training itself. Michael? Yeah, you know, if the goal is to put on as much muscle as possible, which isn't necessarily everybody's goal, right. But if I'm going to try to put on as much muscle as possible, people talk about, you know, reps and sets and, and the biggest thing for me is, I mean, you and I both know Pablo sets on for a long time. So I

try to try to follow a lot of puzzles principles, which isn't just puzzles principles, been around for him, but try to stop about a rep or two before failure and as The problem is, is that nobody ever realizes or takes the time to realize what is their actual failure, right? If you're benching 225, for five, right? If you know that your fifth rep, you can't get your six the rep, right? For example, a lot of people don't ever bother to find out, you know, what can they actually get to? Before we can start to figure out well, how many reps? Do I have left? Or should I have left, and if we're talking 12 reps, there's a big difference between 12 and three rep max, some people are really good at those, you know, higher reps be if that's what you train, and genetic factors to that as well, as opposed to somebody who's really good at three Rep. Max. So talk to me a little bit about in the context of rep schemes, and training in general, you know, what do you find to be the best way to maximize hypertrophy?

M

Michael Nelson 50:55

Yeah, my bias is I like what's called the US stress model. So you stress EU Stress Stress, you can genuinely recover from relatively fast. So I'll look at like, let's say you're just doing week to week changes, I'll take each week, we'll kind of slowly ramp up volume over the course of four to maybe eight weeks, I'll do a little bit of a taper where we just slash your volume, they'll do some amrap sets, right? So we kind of push you a little bit to failure to know how many reps you can get with that weight. And then the next day, we'll just start with the the next phase after that, within each week. If they don't have any, let's say strength and goals, per se, they're not trying to be powerlifting, or they're not trying to be a hyper specialist of one lift. I'll just try to move as much stress as I can out over the course of a week. So instead of having Monday be the classic destroy my chest bodybuilding day. Like, yeah, you made bench press on Monday, but then you may do dumbbell press on Wednesday, and military press Friday, right, I'm going to try to move that stress with heavy loads out over the course of the week, to allow your body to recover a little bit. Most people looks like Monday, Wednesday, Friday, maybe Saturday, that's kind of main lifting, Tuesday, Thursday is a little bit more easier cardiovascular stuff. And then the goal is to pick exercise selection that allows you to accumulate the most amount of volume. So don't trap bar deadlift, squat, vertical press bent over rows, you can still add in some accessory stuff, I think that's fine. But most of it would be geared around lifts that allow you to put your body under the most amount of stress. Just because if you're doing a trap bar deadlift, you can get more load on your body than you can a preacher curl doesn't necessarily mean preacher curls are bad. But in terms of the priority, putting yourself under load and using lifts, you could move the most amount of volume, that's going to be the priority. And then as you walk through each day, you'll get into some lighter accessory stuff.



53:03

Yeah, beautiful. I mean, you know, thought volume, being the key at a particular percentage of right, above a, you know, one rep max, or max or three rep max, whatever. So along that that concept. Mike, let me ask you this question. So because I think the term volume can get a little bit tricky in this regard. So if I were to take for just because this is the easiest thing to use pull ups, if I were to do, let's just say I can do 15 pull ups in a row, if I were to do a pull up ladder, right, one and two, then three, all the way up to 12. It's a lot of pull ups, you know. And that's a lot of volume in a short period of time. Let's say I do it all on a 20 minute time, right? That would have a very particular training effect, as opposed to you know, greasing the groove, where if I get a pull up every hour, right, then over the course of the week, I would I would get the same amount of pull ups in the week as I did in that pull up ladder. In fact, I'd get more. But But I'm curious what your thought is in terms of the muscle response in terms of what's going to happen after that up to 12. You know, that pull up ladder, as opposed to the person who greases the groove. I believe that the person who greases the groove, once an hour is really training nervous system, and they'll get really, really good at pull ups, but they won't get the muscle effect that we're looking for in that short period of time when it comes to pure muscle hypertrophy.

M

Michael Nelson 54:36

Yeah. If you would have asked me a couple years ago, I'd say I probably agree with you and now I'm not so sure. Because there's been a couple. Yeah, there's been a couple of studies where they've replicated this now where they took a group and they said, Okay, we're gonna volume match a group at like, 85% of the one around And then we're going to have some group do like a rep stuff, right? So a simple example, I can't remember what exactly they used is, let's say you're gonna do 10 sets of three reps, right, so you're gonna do a lot of sets, but you're gonna do a low rep per set, and then you're gonna do like a three by 10, right old school alarm, you're gonna do more volume is just distributed different. So both groups are volume equated, but they're inverse of each other. Right, the three by 10, you're gonna get a lot more local fatigue, it's just gonna take you not as much time etc. The studies that looked at that, which again, they're short term, doesn't show much of a hypertrophy difference between them. If the volume is equated, the group that did the 10 by three, though, did get stronger. And the downside with the strength group is they usually tend to complain that trying to do that type of training for the entire study was horrible. They hated life, and their joints hurt. So there's a pro and a con to both of them. So I think, if you're trying to get stronger, doing more volume at a higher percentage is going to be good. And I think if you can get enough volume, you can probably still get some of the hypertrophy response. The hard part is like used to do we end up with issues of potentially recovery, could you come back in and do it again? Because it's the volume

scaled over time, that's gonna matter? And then are your joints hating you? How much time do you have in the gym to do it? So I think if you were to give, like, if volume is equated, I think the hypertrophy response is probably going to be relatively similar, would be my guess. Yeah, the



56:39

thing that I hate about these kind of studies, Mike, like, what you just cited, is, and I don't have to tell you is that it's very easy for people who are untrained to start using joints instead of muscles. Yes, right. So if I'm going to do pull ups, like, I know that I'm gonna, you know, engage my muscles and do the pull up, and I know I'm activating, or a push up, right, people get like, up in their shoulders, and it's just, it looks nasty, man, they're sagging their backs. And, and this is where you get joint problems, and you're no longer you know, properly training muscle, you're not thinking about getting tight and packing your shoulders and what your scapula is supposed to do. So in studies like this, I always take it with a grain of salt, because, you know, training is a skill, you know, and know how to activate muscles and skill. If you ask somebody to do something for 10 reps, as opposed to three, of course, the three reps is going to look better than the 10. By the time that person gets to 567, and eight, they're just, they're just miserable, their form is breaking down, they're no longer activating muscle. And so my point is, is that if you're taking somebody that's highly trained and knows how to activate muscle get tight, you know, use the appropriate mechanics. That's where I speculate that the pull up ladder in terms of hypertrophy, right in terms of not in terms of whether or not that person will do more pull ups in a single event in three months from now, I think, you know, greasing the groove, that person will almost certainly do better than the person doing pull up ladders once a week. Because they're training the nervous system. nice and fresh. It's perfect grabs, you're getting the volume over time. I'm just talking about the aesthetic component of the batch. That's my point. I mean, there's no right or wrong. I'm just giving my thoughts. Yeah,

M

Michael Nelson 58:22

I mean, I mean, I generally agree with like, the principles. I agree. 100% it's about activations about quality of work, like do the highest quality work, you can over time. I do think that the old myth of low rep training is only a central nervous system stuff is kind of going away. Just because you're that amount of tissue is still under load.



58:50

Yeah, I'm not sure. Let me just be clear. I'm not saying that it's only central nervous.

Primarily. Yeah, you have the benefit of being fresh. Yes. Get wrapped in when you're very fresh, and therefore the form is perfect.

M

Michael Nelson 59:03

Yes. I agree. Cuz you have you removed fatigue from the equation. Yeah, I agree. Yep. Um, let me I know, we're running out of time. Let me get one more. Yeah, no worries.

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59:13

So last time, we talked to any guy unfortunately, got really kind of messed up. But we talked a lot about magnesium, not one point. And just Mike, can you talk about, so I'm going to give you a situation I have a client who's 18 year old son has high blood pressure, and he's not particularly heavy. I know how the, how the kid eats he doesn't eat very well. You know, he eats pretty much the same foods all the time. My immediate thought was it's an electrolyte issue because I know what you eat. And it's also a hydration issue. So do me a favor, get more magnesium in and I told them to start with 200 milligrams of potassium three times a day and And see what happens as you hydrate. So I also wanted him to do the blood glucose monitor because I wanted to rule out type two diabetes and but just in general Mike, if you could just talk about, you know, my thoughts on that, first of all, and also just how hard it is to, to like, even as a healthy eater, I find that hard to get, you know, 4500 milligrams potassium, and Nevermind. And I'm training hard. So the harder you train, the more you do, the more you pretty much need and keeping these electrolytes in balance and sort of the, the key takes remember last time, we also talked about salt and things like this. Yeah, just give me your thoughts on some of this stuff.

M

Michael Nelson 1:00:39

Yeah. I mean, I think the biggest thing that's changed for me if someone is very healthy, doesn't have any metabolic issues is eating very good. I actually think they're probably low in sodium, which we talked a little bit about last time. Yeah. And that's something I wish I would have looked at sooner than what I did. I think magnesium is the next one. Most people are going to be low on right, just scan their thing if they eat anything green, probably a high amount of magnesium like green Skittles and m&ms don't count. But most people are going to be pretty darn low. So like you said, adding supplemental magnesium, I think is very good. Dr. James Lavelle. I got that tip from him. Like he has high end athletes where he just gives him a shit ton of magnesium. And he's like, Oh my god, they feel amazing The next day, like so even high level athletes sometimes are low in it. Potassium is one of those that can be low depending upon where they get from their

nutrition. So it's definitely one to look at. The good part is your, your body will tend to regulate electrolytes, okay, but that doesn't necessarily mean it's the best for performance or long term health. Right? It doesn't mean that you're going to drop dead because you didn't eat sodium one day, your body's going to figure out a way to make it happen. So that house too. But again, that comes I think at a cost of potentially longevity, potentially acute performance, like you'll definitely see changes in performance and just how you feel though.



1:02:04

Yeah, yeah, beautiful. And just in terms of how, you know, pour liquid meaning, literally not enough, Monette, magnesium, not enough potassium, you know, having these ratios weigh off how it does, in fact, affect your blood pressure, along with obviously being dehydrated, that these are things that people aren't thinking about, and are probably the biggest elephant in the room. When you think about what electrolytes do, like they literally conduct electricity, right? I mean, need this tap. That's how your heart is beating,



Michael Nelson 1:02:33

all your cells have to maintain our gradient of a certain amount inside the cell and a certain amount outside the cell, like literally every cell in your body has to do that. So it's one of those things where your body has to figure out a way to accomplish it. But it may throw some other stuff under the bus to make sure that happens. Yeah, beautiful. Mike, I appreciate your time. So much. I mean, it's been a little over an hour now. Oh, yeah. Cool. You know,



1:03:00

I like I could do this all day, literally, but I can't thank you enough for the conversation. And I got a lot out of it.



Michael Nelson 1:03:07

Awesome. Yeah. Thank you so much. I really appreciate it. And as always good talking to you. It's always fun.



1:03:12

I'm gonna keep you posted on that research on those constant blood glucose monitors.



Michael Nelson 1:03:16

Yeah, let me know what you find. That would be super interesting. I think that'd be quite eye opening for people to Yeah, I I'm gonna take your advice on that first week. I love that idea. Yeah. And that gives him the comparison then to because some people be okay. Some people are kind of a train wreck. I think just having that really good. baseline is like super useful for people. Awesome. Thanks again, Mike. Cool. Awesome, man. Thank you. Thank you so much for listening to the podcast. A big thank you to Thomas Phillips, for all of the great questions. really appreciated. You can find him in the link below here at Fit for Life. I will have the website links there. Thank you to him. I hope you enjoyed all the questions there. Thank you so much. As always, for listening. I really appreciate it. If you can help us out by hitting subscribe, downloading the podcast, sharing it with any of your friends. As always leave us a comment or whatever star review you think it is worth. I read all the comments, anything that you would like to see on the podcast for topics. drop me a note. We'd love to hear from you. So thank you so much, greatly appreciate it. Talk to you soon.