Episode 139- Athlete Monitoring with Heart Rate Variability ...

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SPEAKERS

Michael Nelson, Travis Mash

M

Michael Nelson 00:00

Welcome back to the flexure diet podcast. I'm your host, Dr. Mike C. Nelson, where on the podcast, we talk all about things you can do to increase performance, body composition, add some lean muscle in all without destroying your health in the process. Today on the program, my buddy Travis mash, we talk all about athlete monitoring, and much more. So he shares his background, how he is actually going back to school. Right now he's about halfway through a PhD. And he's 48. So he's an older person like me, oh, we're almost the same age actually. We talked about is it different to go back to school once you're older, and what his research will be, which will be athlete monitoring. Some other side tangents of the work of Dr. Keith bar, looking at collagen, and isometrics. Travis, there's some very interesting stuff that he did with isometrics with his athletes. And then we get into athlete monitoring, everything from heart rate variability, she heard me talk a lot about something called RSI, reactive strength index that he uses to measure his athletes both acutely, and then also chronically, velocity based training, VVT, and many others. We also chat along the way about the effect of NSAIDs potentially on muscle growth. He was asking me about protocols I've used for cold water and heat. So I kind of break down the model that I use from the fist flex cert on that. And at the end, we even talk about flywheel training. So I recently purchased flywheel device from Essentrics. K box. And I really liked it. And it's a way I think, to use velocity in your training, even if you are not doing Olympic weightlifting. So again, even if you're listening to this, and you're not an Olympic weightlifter, I still think there's a lot of practical things you can take out and apply to your training. And if you are working with higher level athletes, then Travis breaks down all the little indicators and things that he uses to monitor them over time. So today's program is brought to you by the physiologic flexibility certification, the fist flex cert will open up again in early April of 2022, depending upon when you're listening to this. And in that certification, I break down the four homeostatic regulators. These are areas that you would need to train in order to be much harder to kill, increase recovery and robustness of your body. So once you have the basics of good nutrition and movement down and sleep, such as taught in the flex a diet cert, this, to me is the next level that will allow you to recover faster. And I also believe increase your longevity. At the same time to the four homeostatic regulators are going to be temperature, pH, fuels, and air oxygen and co2. And in the cert, we have the same format as

the flex diet cert. So there's going to be eight interventions, right. So for temperature, you can have either a high temperature such as a sauna, or exercise in the heat, and then a cold temperature, such as cold water immersion, which I'm getting ready to do here after my cardio today. And at the end, you'll understand the four homeostatic regulators, you'll learn the idea of physiologic flexibility, what it is, is a concept. And then I also provide 40 specific action items and a full system for you to figure out what to do with yourself or your athletes. One of the problems right now is that these areas are becoming quite sexy. And there's some more talk about him, which is awesome. But it's extremely confusing. Should you use hot should you use cold? Like, at what point should I do different breathing techniques? Should I add intervals or do a long slow distance training? Right? Because if I work on intervals, so faster pace, that is something that is potentially changing your pH as you are literally dumping acid, hydrogen ions into the muscle. So we go through all of that and break it down into a system that you can apply to yourself and your clients so that you know exactly what to use at the right time. So go to physiologic flexibility.com. This is not open, when you're listening to this, you'll still be able to get on to the waitlist there. So you'll have all the information available to you once it is open or opens again. So sit back and grab some coffee. It's your neurons firing, and listen to my chat here with Travis mash of mash elite. Hey, welcome back to the flex diet podcast. And I actually have a formal intro this week, which is kind of kind of crazy. The last two guests, I just sort of we just started talking. So yeah, I'm here with Coach Travis mash. So say hello.

T **Travis Mash** 05:40

Hey, man, I'm excited to always talk to you and obviously, to hear.

M **Michael Nelson** 05:45

Yeah, thank you so much for being here. I'm super excited to talk to you, we'll probably get into a little bit about the PhD process and some athlete monitoring from heart rate variability to a whole bunch of other stuff. And the great part about you is that you actually have data on like high level athletes, not just the people in grad students that you just shoved into a lab just to do measurements to see what the hell happens.

T **Travis Mash** 06:09

That was the whole point. Yes, I wanted to be able to, I wanted to do this research on, you know, the athletes I work with, because, you know, it's, it's a big difference in regular people, and then people who are at the elite level, so yeah,

M **Michael Nelson** 06:24

yeah. And just in case people are living under a rock and don't know anything about you give us a little bit of background on what you've been doing. You've been coaching for quite a while, and you've got some super heavy, impressive lifts, and maybe a former life or a few years back,

Travis Mash 06:39

former life. But I was I played football at Appalachian State University. And that's where I was introduced to science. And I also was lucky enough to have an amazing strength coach, because this is like 91 to 95, which is good. This thing was just kind of like, you know, becoming popular. And I had Mike Kant, who still I mean, he just, he was at Florida University Florence few years ago. He was incredible. And it was of the whole experience of Appalachian, that was the greatest because I got to see what great city niching performance can do. Like for example, we had an athlete, Matt Stevens, who was a walk on at Appalachian. And he was up, he was 176 pounds, six foot one and ran a four 740 and had a wasn't various verticals like maybe 28. So he was like, average at best. And, but he moved well, and he had a lot of skills. He was good at that guy. When he graduated. He went, I'm pretty sure he was drafted in the second round NFL, but he was 215 pounds and ran a four 440 yard dash that was, you know, that was laser because it was NFL Combine. And his verbal elite was 38 inches. I mean, it was like, Oh, it was a transformation. It so then I was I was fascinated. And I saw there was a bunch of us. It's just he had the biggest, you know, he was like a miracle. And so that's what got me intrigued. Anyway, then I went to, I graduated, I went straight to Colorado Springs. I got to coach and we looked at weightlifting. And that was West Barnett Tom Olympian. You're later I was invited from a training center. And I was doing weightlifting. And then I had to finally get sick on the stem of the story. Am I gonna drag it on too much more, but No, you're good. And a father who got sick in North Carolina. I moved back home. Back then, you know, there was a CrossFit. So there wasn't weightlifting on every corner. So I started powerlifting. That was like 2001. And then by the time it was like 2004, I was a world champion power lifter. I won the world championships three times. Brooke, several world records. I don't know. I'm not quite sure how many. But it was the all time total was my favorite though to 20. Anyway, so then. So

what was your total at 224 14? What was it decided to cut out there?

Travis Mash 09:09

2414 2414. That was a beat at cons all time world record. And so that was the goal. That did it. However, we went on to beat me so the greatest for reason.

But yeah, that's awesome. Almost that.

Travis Mash 09:29

And then, through all that I was coaching athletes in 1996 Jenny Driscoll, she was a volleyball player. She was my very first athletic performance client. But then when I was in Colorado, you know, I was coaching and training the whole time. I got to work with pro boxers. I got to work with some ice skaters because the world arena was right there. So I have biggest fear. I got to meet Charles pull again. I got to meet great, a great contractor. Oh, Dr. Mike Lee, the guy who in that letter T. Yeah. So it was just a great learning experience. The deuce of T Nation

Magazine, you probably know them. Yeah. Right down the road. Yeah, right. Yeah. So they were all like right there. And then since then I've been coaching athletes since and somehow, around 2012 I started getting back into coaching, weightlifting. And then I got the chance to work with muscle memory USA as a professional winning coach. And so then, somehow, someway, I started being you know, the weightlifting coach. So here we are. And now I'm back in school, so we're gonna pay. So there we go.

M Michael Nelson 10:39

I'll go back to school for a PhD. I mean, that's, I always think it's interesting as an older student going back, and I graduated my PhD when I was 3839. I think losing track of time now, but

T Travis Mash 10:52

you said 38. Mommy, yeah, yeah, it's

M Michael Nelson 10:56

how is it different going back at your age? Because you're in your mid 40s? Now? Correct.

T Travis Mash 11:01

I'm 48. Somebody? Yeah. Yeah. So I feel like I'm a much better student now. I mean, I was always a pretty good student. But yeah, my mother who was demanding on me, and that was good, thank God. And so, it, I feel like school. It's a do I love it, you know, so when I'm taking biomechanics, you know, I love it. And so I'm not just taking the class, like, I'm applying it right away. And that's a huge advantage. So you know, when I learned about a moment arm, I'm going straight to the weight room. And I'm like, figuring that out more specifically, you know. So that's, that's a big difference in physiology. Like, I'm everything I'm learning, I'm applying immediately. Like, right now, this semester, I'm really working on a deeper dive into sport psychology. And like, it has been a, I tell you what, man in his first few weeks this semester, I feel like I've improved the most of my entire life as a coach, just because of like, really thinking about the things that I'm doing and saying, expressions on my face, seeing how my athlete responds, it's been a huge improvement. So I wanted to go back to school because I did not want to be, you know, this in our world, you have the people like you, PhD, you're brilliant, you know, you coach people that you know, you work with clients. So you have that. And then there's people who are these great athletes, and they have a voice. That's okay. And then you have people who are just just to cut, you know, they coach, several athletes, and they have a voice. And so I wanted to bridge the worlds so we can understand each other better. Like I've been a great athlete, I've coached great athletes, and now I'm in you're trying to get in your world as an academia, so I can like bridge the gap.

M Michael Nelson 12:45

No, I think that's great. Because even when I went back to school, I was. It was interesting, especially being done that. I think all the interesting stuff now is all in the overlaps, right? It's

especially being done that. I think all the interesting stuff now is all in the overlaps, right? It's an overlap of coach Gene or physiology of Muscle Fitness, and neurology, or the psychology aspect. There's all these overlaps that I think are like the next interesting area. And everyone talks about it. And they're like, oh, yeah, we have to, you know, Mind the Gap and fill in these things. But there's not many people that do it. And after I've kind of been in a little bit of both of those worlds, I kind of understand why. Because like from the research side, like I don't do research full time. Now I help out with some papers and things. I'm interested here and there. So the hardcore researchers, they're like, you haven't published enough papers as first author, what are you doing? And then to like, hardcore coaches? It's like, oh, but you don't coach, you're not in the gym, you know, 60 hours a week, like bleeding through your eyeballs, right? No, but I'm like, I'm not trying to do either one of those 100% I'm trying to look at the interactions between the two. So it's, it's a thing that's definitely needed. But from the the standard, how it's been done for so long, you get lots of hate mail from both sides.

T Travis Mash 13:59

Agree, man, I feel like you know, I'll I will write something about velocity based training. And then there'll be a coach that will be like, Oh, you don't need velocity based training?

M Michael Nelson 14:08

What are you doing all that tech stuff, man, come on, just watch it doing,

T Travis Mash 14:11

right? And they'll be like, you guys, all you do is track, you don't know how to use it. I'm like, son, you come to my gym, and I'll show you how we track and use it. You know, like, that's the point. You know what, what it is, you know, is that these people are afraid. I mean, I get it. You know, you're in the gym all the time, you're coaching hundreds of athletes and like, the thought of like learning a whole new subject area like, like HRV, or velocity based training or flywheel training, it freaks you out. You're like, Man, I don't have time to sit down at nighttime and try to figure this thing out. So the goal I have is to be able to simplify it for him because like, you know, at the base of loss based training, it's not very complicated. It's very easy to understand. And it's, it's, you can I can implement it in no time at all. And I can make that I can make to easy on, sounds like they don't freak out on me and just, you know, block it without even considering I'll make that transition and that learning process easier. At least, that's my goal, which something you do very well as well.

M Michael Nelson 15:14

Do you find that the students, they're like, I noticed this when I went to grad school, like I, the two things I got wrong, I thought, one, oh, this is gonna be so amazing. Like, I'm gonna sit down and have like, these super in depth, you know, conversations about detailed stuff with my advisor and all the people are gonna be working on the same projects. And that like never happened, like I had those conversations, but it was not with people in my department. And it was also interesting how divorced it was from any application. So the Ryan joke is, you know,

students are coming in the lab, like me and two other PhD students. It was anything remotely applied, like the easiest question. They don't like playing amigo, I don't know. Just ask him. I'm like, you're getting a frickin PhD. And this is the exercise physiology department. You're a smart person, you understand stuff. But then you realize that like, they don't have to apply any of it. They're gonna do you know, muscle atrophy researching and cancer, whatever. Definitely 100% needed. I'm not saying they shouldn't study that. But it was just weird. It even like the highest level how divorced a lot of application was from it, which was kind of shocking to me. I

T Travis Mash 16:21

know a lot. Luckily, there's two professors that are, you know, they seem to be like, very frequent, um, they're my professors. So I have to keep lighting is, you know, really big expert in biomechanics, and asset monitoring. So today, we're gonna talk about today. Yeah. So we've become the best friends. And so literally, I actually had a different advisor. But the more we got to know each other, he literally just took that rollover. Like, I didn't even ask for it. And then Dr. Cook was my original advisor, and the one who helped me start the weightlifting program. And the nor Ryan university, you know, he is more of the physiologist in so like, he's done a lot of research on perjury. So and both of them love as sport performance, and especially they love weightlifting. Yeah. So they've really helped helped me to implement it. So anytime they have any idea, they call me and, you know, we figured out with my athletes, so it's, I've been very blessed at this university, in particular, to be somewhere where the professor, you know, the head of department is good. So like, you know, he loves it for a spin. I've had good experience.

M Michael Nelson 17:30

Yeah, no, that's awesome. I always throw that caveat out. Because I think people listening to this, especially a lot of up and coming coaches, it's become a life a better word trendy to get more advanced degrees. Now, and again, I'm not trying to talk to a lot of advanced degree, but a little bit of a warning of like, you know, the department urine is amazing. Alright, the department I was in, I literally sat down and asked my advisor once I said, Why are you in the exercise physiology department, because you don't give a shit about performance at all. And he's like, I just use exercise to push variables around in the body. And I'm like, okay, that's valid, but I'm like, I, I just never thought of it. Because I'm always like, well, how does it performance? How does it affect function? So a caveat for people listening? Make sure to ask the department, what do they enjoy? What research have they published to make sure that it's a good fit for you or your life's gonna be held?

T Travis Mash 18:24

Yeah. And there are several departments out there, you know, and it's getting much better. There's a few, there's a few out there who are like, you know, performance minded. And now this one, we talked to a gentleman, somewhere up north, you they're starting an online university. That's all geared towards, like actual performance implementation. So that should be cool. So one of the things I want to do too, by the way, in the future,

M Michael Nelson 18:51

yeah. And I think that's great. Like, there are those departments you can find, you know, my buddy, Dr. Bill Campbell runs a whole lab that's just looking at pyin athletic performance and body comp in primarily physique athletes, you know, so there are these little niche areas out there that you can still find, which is great. Yeah.

T Travis Mash 19:08

Yeah, you're talking to Dr. Keith bar, like, yeah, attending guys. I, I love talking that dude. And I think his advantage is he started out as a strength coach in our PE teacher. Yeah. Which is amazing. I'm like, how is that guy PE teacher, but so he is really good at implementation. And here's how you could use it. And, you know, give me like, like guidelines, and then there's lots of things you can as a practitioner, in a lot of ways you can run with it.

M Michael Nelson 19:39

Yeah. And he also consults with some pretty high level, you know, athletes and that kind of stuff, too. And it's funny though, like I talked to Stu Phillips about that, too. And he was a great guy. And you know, Stu and Keith are good friends, but he was kind of in a nice way, giving him shit about his models where, you know, there's only a limit of them and all that kind of stuff. And he was very frank with what the research is. But as you know, like, if you're looking at soft tendons you're looking at or soft tissue. No one's gonna allow you to biopsy their ACL and a human, right. So it's do is just doing it more in in just because they know each other and that kind of stuff. But it's always interesting to me have it's easy to be a critic and to understand what the limits of that model are and what you can actually do. Right. So I can read Keith bars research and say, well, a lot of it's animal data. It's anecdotal, they did some stuff on athletes, like where's the tissue biopsy of the data to show that it's actually better? That's like, Okay, you're really going to biopsy someone's ACL, especially a high level athlete. Good luck with all that.

T Travis Mash 20:40

Well, I have I have now least man a semesters worth of data on our athletes, what we did is we implemented a lot of his, like principles, like for example, you know, like, he would tell you that the two ways to change the the tendon tissue in a way that's advantageous to an athlete would be isometrics would help thicken it. And then like the bounding will help the matrix form. And so we have many in our warm ups every single day, we've implemented certain specific isometric work, and where it works concerning a weightlifter. And we've implemented bounding in the form of simply just jump rope. We do. And it we've had a dramatic increase in vertical leaps. You know, it's been crazy, like, interesting, just jumped. Last semester, he jumped 34.5 inches this semester, 41 inches. Wow. And he's gained weight. And so it's not like he's, like, leaned up, which you can do. Now he's gained weight. It was, I couldn't believe it. So and it wasn't a fluke, like he did 41 One day. So I tested him the next day got 4045. It's like, insane. Anyway. So there's that anecdotal evidence and with the data, so I don't know.

M Michael Nelson 22:05

Is that is that just using his training recommendations? Right. So let me know if I oversimplified this too much. If you've got an athlete who's very strong, but not very springy, maybe they should do more springy type training, or vice versa. If someone's a little bit too springy, maybe they just need to get stronger. Right? You could use like a rsi, Relative Strength Index to quantify that. I don't know if that's what you did. In that case?

T Travis Mash 22:31

That's exactly what we did. Okay. Got it. So, yeah. And have you

M Michael Nelson 22:35

been able to provide any collagen or anything like that to see if there's any additional nutritional effect? That

T Travis Mash 22:41

No, but you know, next phase will be that very thing. And so, you know, probably next semester? You know, I will add that because if you do it all, it's hard to tell what they don't know what's what, right. So this semester, we simply implemented the isometric work and the bounding, and it was a dramatic, nothing else. She's not here to let me throw this caveat that same. By the way, every single one of the athletes improved. And we did we did zero plyometrics that were weightlifters. So, by nature, what we do is similar, and it's explicit, but this kid has been with me, over twice, it seems 1012 years. So I've been the only one that's ever trained this kid. So nothing changed. Other than an implement an addition of the isometrics in the mountain. That's it.

M Michael Nelson 23:32

That's super cool. Yeah. And if if you are able to do nutritional intervention, would you be able to do one of them as a placebo? Like taste matched control?

T Travis Mash 23:42

Totally. Yeah. Yeah. Yeah. And I could do it with like, you know what I could do it when it comes to weightlifting, I have about 25 athletes, but in the school, you know, the, the room, I could get hundreds, you know, so I have the ability to do whatever I want to do, which is pretty exciting.

M Michael Nelson 24:01

Yeah. I think that it would be great because, I mean, I read the case stuff years ago, and I started using it, um, you know, a fair amount of athletes, especially before they're like heavier, more lack of better word tissue intensive type, you know, days and, again, completely anecdotal. There's whole bunch of other factors, but it seems to help, right? Because I'm like,

what, what's the, the negative downside? They're already getting enough protein. So muscle recovery is going to be fine. So we're adding 15 grams of collagen a little bit of vitamin C 40 to 60 minutes before they train. Like if it doesn't do anything, there's no negative side effect other than a little bit of cost a little bit of a pain in the ass on their aspect to

T Travis Mash 24:39

me ask you with when it comes to collagen, like is there a brand or what would you recommend if we if we took that next step?

M Michael Nelson 24:48

I mean, I've been using the Great Lakes one. I've used Vital Proteins. I've talked to those guys a fair amount. Those are the two I primarily only used that There's no data on it, but I get more nervous on things that I know are going to be part of your physical structure in terms of quality, right, like vitamin C sorbic acid, like it's so mass produced, it's almost the same everywhere you use it, you kind of miss out a fair amount of it. But like collagen, you know, fish oil, like some things have become like, literally part of your structure. I'm like, I don't have any data to prove it, but I'll pay the extra $10 A container and buy something I know is pretty high quality and much, uh, probably not get a bunch of other crap in there, too.

T Travis Mash 25:31

Yeah, which is for us is ultra important. You know, you know, you SATA for testing, right? Word, some BS like that. How much vitamin C. So 15 grams of collagen every single day that we're saying?

M Michael Nelson 25:45

Yeah, so it's 10 to 15 grams, the studies were done, use 15 grams. They did it about 40 to 60 minutes before exercise. If you talk to Keith, like the vitamin C, he's like, he's not even sure if that makes any difference. It was a super small amount, like 30 milligrams or something like that. It was like a tiny amount. But the hard part is they did it with the initial studies. Right? So if you change anything from the initial studies, someone could come out and say, oh, is a vitamin C, you idiot. Why didn't you put it in? Right?

T Travis Mash 26:15

Right? Right. So I will definitely implement that now. And see if there's further if it is, it'll be insane because 41 is the highest is it now when I save vertically, there's no step.

M Michael Nelson 26:30

Literally not static, right? Just Vertec or whatever using? We're now

T Travis Mash 26:33

we use the jump mat. Cool for tech. So like, you know, I can I can make alterations. And

M Michael Nelson 26:40

you can see, I'm at the top like, sure you are

T Travis Mash 26:45

literally I made a career teaching people how to cheat that. So I don't right, the vertex. So yeah, the the GMAT seems to work really well, we we test there, you'll dig this because this will segment into the attic testing. Like we we teach the RSI every day, we do a 45 centimeter depth jump and we have with the jump mat, you know, anyone who doesn't know it's, what you do is you take the height of the job and divided by the ground contact time, which gives you you know, a correlate or gives you a number to compare to other people. So I just use a t score to compare everybody see, using the topic of the RSI scores isn't the bottom that I draw correlations between improvement and it's been the results have been really cool. I'll be presenting soon, soon.

M Michael Nelson 27:36

So you're using an RSI score then to auto regulate their training for that right? Or is it a long term marker? Or is it both

T Travis Mash 27:44

all the above so every single day they come in and they do a subjective questionnaire, you know, that we're going to look at like fatigue and stress outside of you know, the weight room because for all the I don't know, there's a whole lot of stress other than what I'm when I'm prescribing and, you know, stress is stress as anyone who knows anything about homeostasis like, you know, like, if I put stress on the body in the form of like, a girlfriend breaks up with you, it could be worse than a 10 by 10 You know, German Volume squat, oh, yeah, session it's, we have, so they do the subjective questionnaire they do. The you know, we do it after we will not we have that Keith bar, well, he didn't do the work for me, but it is a first then we go directly into they do the write their daily goal on a bar on the board. So I can see we can becomes reality, we can encourage everyone based on this, you know, their their subjective goal for the day. And then we test their their 45 centimeter depth jump. And then the third instrument wanted to I wanted to compare the three is in we take 85% of whatever movement is first whether it's a snatch, clean and jerk, a squat, pull whatever it is, and we look at 5% on an ongoing basis. And I start to develop you know, this is this is their average and if they're 10% above or below, we make changes. So if it's 10% Drop the normal, you know, I took Brian Nan's suggestions and what we do is some very light metabolic stress bodybuilding and send them home and get them recovered. So

M Michael Nelson 29:27

like a one by 20 or just like old school, just get a pump and leave.

T Travis Mash 29:33

Literally it's all school, get a pump and leave trying to do stuff that's not a whole lot of like muscle damage, but just metabolic stress. No I think have you thought about just doing some like what's the blood flow

into VFR blood flow restriction?

T Travis Mash 29:48

Yep. In like you try to do is encourage the the hormonal response that might help with Phil recovery process. Yeah, I know data to back that up. But

M Michael Nelson 29:57

yeah, yeah. Do you think part of recovery This is like the old school Soviet stuff to that recovery is just blood flow. I mean, they were reaching that stuff for decades. And then the West were kind of like, I don't know, that's on, there's no data to support it. But you talk to like, every high level coach I've ever talked to, like almost all the recovery metrics for the most part, like, they kind of center around, like just getting more blood flow into the tissue that's having issues.

T Travis Mash 30:21

Right. You know, first, I would say nutrition asleep.

M Michael Nelson 30:26

Yeah. Cuz I mean, you have the basics done, but like what you would do in a session? Yeah.

T Travis Mash 30:29

Right. What I would do is like, yeah, we would increase blood flow, maybe, you know, change the, you know, what are your thoughts? This is more your world. But what about the contrast chanting the hot, cold, hot, cold, or nowadays, everyone's into cold. But there's like a split? You know, some people say, Absolutely not. Some people say

M Michael Nelson 30:48

yeah, so I would. So what I do with athletes is even just general population is, I imagine like a slight use a barbell model. And if you have no experience to call, you have no experience to heat and you've got access to both right. So it's not an access issue. I'm like, wait, what, what are your goals, to me, like heat has almost no downside, we're cold water potentially has more of a downside, right. So I would start a Monday heat and just like get in the sauna, get warm, you know, don't push yourself crazy, drink some fluid, do some relaxing, breathing, and then just watch the temperature and then the time that they're in there. And I'll just run those adaptations by just like scaling, lifting, right gonna go a little higher temperature gonna go a little bit longer, you know, once you start getting to 2030 minutes, you probably want to bump the temperature back up, go back down, you know, scale that up for 468 weeks. And then if you want to go further, then I would leave that adaptation kind of on hold. So maybe you do it one or two sessions a week. And then maybe you do some cold water immersion. So I would do that up to their, their chin. I just had people start at 50 degrees for 30 seconds. So pretty easy, it still feels cold, like never gotten 50 degree water. It's not. It's not warm. People are, are kind of hyper worried about the effect on muscle mass. But if you look at like the four studies of Madonna, most of them are from Norway. It's about 50 degrees Fahrenheit for at least 10 minutes. And that has to be done immediately after training. And I went through for the fist flexor and I got I must have spent months trying to figure out like, okay, in English, what does this mean? Right? If I'm Joe burrow meathead, and I'm like, I'm gonna do cold water for 50 degrees for 10 minutes after all my hypertrophy sessions, like how much mass out of what I could potentially accumulate like, what does that cost me? Right? I just stuff my my mythical, like the maximum rate of gain is like a pound per month, which for advanced athletes is probably way too high. Is it? Is it cold water immersion, costing me half a pound a quarter of a pound a third of a pound? And the answer is I I don't know. Because all the data is mixed, right? You're looking at muscle fiber changes. There was one study that did do DEXA. But the air within the DEXA doesn't really allow you to figure out what the amount would really be because of the error bars. And so it does appear to be a real thing. But unless you're all out maximal hypertrophy, I don't think you need to worry about it. So I'd have people do cold work up to, you know, probably down to 40 degrees, once you get to about five or six minutes at that temperature easily. Then drop the temp and go again. So I'd have new cold for another 48 weeks, the ones are good at cold, their heat is still kind of good, then I would have them do contrast. So then I would have them do hot, and then a little bit of cold and then back and forth. Cool. I like that. Because I think that is the biggest stressor. And it has so many unknowns, you can't troubleshoot it. Right? Like how long were in the hot? Well, how long did it feel? What was the temperature was the duration? Okay, how long before now you got in the cold? What was the temp? What was the duration? You've got so many moving variables that if it doesn't work, you're like, shit? I don't know. I don't know if it works. Don't worry about it. Right.

T Travis Mash 34:16

Really, I never heard anyone talk in terms of like, too busy talking like I would talk scribing you know, volume. Yeah. Yeah, this is great.

M Michael Nelson 34:25

Because it's a stressor, right? Sure. You're putting a stressor on the system. That's what people forget is that, yeah, it does cost some beneficial things. But that's after the fact again, like I've seen people just crushed themselves in the sauna and their performance and HRV just get worse. Yeah, I've seen people do it with cold water too. They're just like, Man, I'm going to suffer through it. I heard that you got to shiver to motivate fat loss and I'm doing 10 rounds of Wim Hof before I get in a super ventilation method, and their HRV is just crossing. The HRV is just tanking. And I'm like, What are you doing? Like, we didn't change your training. They're like, Oh, I added all these recovery metrics. I'm like, but your recovery is so stressful. You're getting worse, not better. And then once they pulled everything back, they're like, oh, yeah, no, I do feel better.

T Travis Mash 35:14

Yeah, I mean, at least on general, lower so obsessive in nature, we do have to be careful of what we tell them. Like, if we're going to tell them, you know, recovery, ice is good, if that's what we think. You got to be very careful. Or like, you know, like someone's trying to be a world champion. They're gonna be like, they're gonna do a Polar Plunge rally. So they're like, Oh, that's good. This is good. Dude, this thing's better. And it's not so what's your, your take on ice is like, maybe it is good. No, that give you talk to Aaron horsey. Scott University? Oh,

M Michael Nelson 35:47

no, I just got his name, though. They were trying to get them on Iron radio, actually. So

T Travis Mash 35:51

that's my boy. Oh, cool. He's such a great guy. Now he, you know, he was actually one of the guests. Instructors at my university in my, in my, in my master's program. Oh, nice. Yeah. And he said he, he presented a study that really crushed us in a said like, no, because it like hinders, like the macrophages response. And so which is know this, when you work out, you damage your muscles, the response is how you get more muscle, but I said you would actually, only when you slow it down, and it's in certain phases, you might completely eliminate the D recovery,

M Michael Nelson 36:32

which can so the studies on that are some of the more mechanistic studies. It doesn't appear to affect inflammation from the studies that I've read, but some of the other immune stuff definitely changes. The caveat is that most of those studies weren't necessarily paired with a performance or a body comp aspect. And if they were, it's just kind of like things kind of moving in the same direction. So I would agree with that. But then in my head, I always think about like, the data on NSAIDs and muscle, right, so data on NSAIDs and muscle and mice was like, Holy shit, this stuff just completely abolishes it. Like you should never do this. And then the studies in human like, you know, Dr. Scott Trappy, did on the earliest studies in older humans with NSAIDs, Advil, and they're like, whoa, son of a bitch. This is like mildly anabolic. Like we

fucked up the study, like they thought they completely screwed it up. And luckily, they had to have people have themselves film, taking the Advil, so they thought their compliance was shit turns the clients was amazing. And now the new theory is, well, maybe lifters maybe it's not as detrimental as we if we think we're not 100% Sure, but an older people because you're modifying inflammation to a more positive direction, that it's mildly anabolic, and old people. So it's one of these things where, like, you're looking at acute responses, but you don't know what the rest of that curve looks like. And if you think about how intense lifting and performance is, like, if your body didn't adapt to that, we would be so screwed by so I think that's just such a robust adaptation that it's, it's almost impossible to drive it to zero. Now, if you're a hot and trained high level athletes, could you do things to erode five? 10% 20%? Yeah, sure, of course, you can. And then you're screwed to, like, I think the general population perspective is, oh, my God, I took three Advil, I lost all my gains, like No, bro, I think you're gonna be fine.

T Travis Mash 38:32

As a former world champion, I'm positive, you're fine. Because when you

talk to high level people take

T Travis Mash 38:40

like, I mean, I should not have liver. Of all the, you know, if I think about all the ibuprofen, I have taken as an athlete, which now I don't take any but as an athlete, but you got to remember, like, it's shifted, you know, my brains perception of pain, which, if you've read the book, endure, which sounds that book leads to awesome, exactly, shout out to him. But it shows and puts sheds light on the brains responsibility, which I do believe in studies is neglected in when it comes to fatigue. And so like, if you're, if there's a pain, your brain is going to be way more open to more volume more, you know, but if you're hurting, your brain is going to shut that down. I think, you know, I would love for some people to do high level studies about the brain's responsibility to fatigue. I think it's hard to explain that, I believe.

M Michael Nelson 39:37

Yeah, they did some old studies on endurance athletes looking at caffeine and aspirin and placebo. And what they found was that a high enough dose that appears that aspirin is an ergogenic. And if you think about endurance athletes, right, that's just high level pain management for frickin hours. Right? You know, like I do some rowing with athletes and they're like, I don't understand like I've cut 30 seconds off my 2k time in the past year, but every time I do a max 2k it still sucks. I'm like, yeah, yeah, it's always gonna suck. Like, you're never gonna get to that point where you're pushing as hard as you can on something. And it's not gonna suck. It doesn't always. It's gonna suck.

T Travis Mash 40:20

Yeah. Oh, it's just like how much your brain can, you know, withstand that? That's a big key is like, you know, they talk in the book talks about the, the, the free divers, the guys? Yeah. I mean, it's insane. I'm sure like, I feel like that is that the part of sports performance that we had the most to gain is a is a deeper dive into the brain. And one's ability to like, you know, get used to that what you just said the suck, it's, it's going to suck. And it's your brain's ability to be get used to that and not shut you down. That's a big key.

M Michael Nelson 40:56

Yeah. And I've noticed that too. Like, if I go away from rowing for a while, and I come back, like even if I've done other things to keep my performance kind of about where it should be by all my other markers. Like I can tell I, I don't have the mental practice of it sucking for seven minutes. You know what I mean? Like, I can feel literally, I'm on a mental practice, because I'm trying so hard to stay focused and not get distracted, where I think you do get used to that at a point where like, you're almost kind of looking forward and you kind of know what to expect, and you've been there and it does become more practice, just like anything else. Right?

T Travis Mash 41:34

An adaptation to the brain's perception of shit. Yeah, yeah. Yeah, that's, that's being a great athlete, especially endurance athletes. Those these are crazy.

M Michael Nelson 41:46

Yeah, it's, that's, yeah, that's just a whole nother world.

T Travis Mash 41:52

Share, I share an office with the school strap line coach, which I remember when they first put me in this office, I was like, you put me with the traveler. And like, you know, you know, I had this higher perception of who I add to my list is not going to know anything. And then we are the best friends. He so his approach to try line is so intense, it makes me want to be a traveling coach. Because, boy, they will preview the course. They'll watch the video, they'll actually do inside rides, while they're watching the course that they're about to go to. It's so in depth. I mean, anyway, that guy, that's why I read the book endure, because, yeah, and I became, you know, buddies to have a new found respect for endurance training. Yeah, it's,

M Michael Nelson 42:40

I think at a high level, it's not that dissimilar. I mean, obviously, the modalities are different, but you're dealing with the same thing, right? So I've only coach just a couple mediocre, triathlon athletes, and one of them was like years ago, he had eight weeks before his event, and I was like, Okay, your swim kind of sucks. Let's not worry about it. I want you every day to practice

your transitions. He's like, What the hell's wrong with you is like I hired you to get better at this thing, like, no, it will still do biking, we'll still do all the other stuff. But the only goals we're really going to make at this point are making sure you're well fed, making sure your nutrition is good, making sure you sleep, making sure your mechanical efficiency is better, right, we'll do whatever we can to change your nervous system. And then you practice your transitions. Because you're not going to become an elite swimmer. In eight weeks. I'm not even if you had the best swimming coach, you're probably not going to see that big of a time difference. But a transition is something you can practice all the time. Whenever I go to like triathletes, I just stand there and watch the transitions. And you see like the pros who have everything completely dialed from shoe position to they've done it like you'll see something get messed up and you'll see him not go off track and they're there, boom, they got a dial and everyone else is stumbles in there. And it's just a clusterfuck for like, sometimes like, like minutes. And you're going oh my god, like the Monitor training to make up say 30 seconds, you would have to do at a high level for something you could just practice, you know, so, and a lot of anything is just troubleshooting. Like you're looking at Olympic weightlifters, you know, with the technique and other things you can change. The thought processes are are similar from a problem solving standpoint is just your modalities are completely different.

T Travis Mash 44:22

Right. We I hear him very similar conversations with his athletes, it's just a little bit different in the modality. So trying to get the best out there. He's got to I have a few that are considered Olympic hopefuls, with one being like he should definitely make it and he's got to that will be Olympic hopefuls for the next Olympics. So we have some really good car seats, especially for a small school we got Oh, yeah, good athletes. It's pretty exciting.

M Michael Nelson 44:54

Yeah, that's awesome. Yeah. And so for athlete monitoring. What do you guys primarily use it? I know you I've done some stuff with heart rate variability, obviously, velocity based training, like what does that kind of look like? Well, we do the keys, like,

T Travis Mash 45:07

which I'll bring it back. But the key will be how you track all this, I'm about to tell you, but so the first step that come in, and they do their, their subjective questionnaire, which looks at sleep, looks at nutrition. And for the better athletes, we look at that, way more, like not subjectively, but you know, objectively, so we look at, you know, they, they track their macros, and they have they wear the whoop for their sleep. So I get more specific spins, you know, if someone's bringing sports at a point and getting done yet, so but anyway, so we track that we ask them questions such as, like, know, on a scale from one to five, five being that I'm in hell, like stress levels, outside of the gym, and so and then they, there's stress, there's fatigue, there's like, is there any event that's not common, such as like, arguments with the spouse or girlfriend, nice guys, cases, a definite family. So anyway, so what that tells me really was subjective data, I really don't look at it until they do, they're after the warm up would go neatly, they do the the depth jump from 45 centimeters, and then they do the flood, they use velocity for everything. But in this in terms of data monitoring, I think monitoring, we like 85% on any,

whichever exercises first, so if it's stats, cleaning, Zurich, squatting, whatever we look at 5%. And over time, we develop, you know, their average. And then if I see a, you know, 10%, dip, then I'm going to immediately go look at subjective questionnaire, figure out the why, then I want to talk to the person I want to, you know, want to gather my information, then talk to them and see if I can be of help in any way. But we track that we look at men, the key would be, we have a really good now I have bridge athletic, it's kind of my software that I use, that collects all that they are integrated with Jim aware, which is the Canisius velocity based training. So it all gets like funneled to one place, all the subjective questionnaire, data, everything. And then I can look at trends and develop correlations, which is what's important. Now, you need some time you need to at least I would recommend doing at least 12 weeks to develop a solid correlations where you can see that, you know, when when Ryan gets only six hours of sleep versus his normal nine, this is, you know, this is what trend you can expect. And this is what day should be the worst. Because a lot of times someone will not sleep the night before that training, they'll do fine that day,

right? Yeah.

T Travis Mash 47:48

Two days later, they have a big dip. Right? So anyways, what it really helps is, it really helps me get by it is because like when they feel like shit, I can let them see the stats. You know, the key is having good software that makes it easy for them to see what I'm talking about. That's, that is the key. But those are things one day I want to get is what is that company that looks at heart rate variability. DC brainwaves? That'd be a mega wave. So I had that locked in when I first got there. Lit. I think they had some changes in the company. Yeah, so now I'm gonna work on that again, because that would be a whole new level. Yeah. Are you familiar with it?

M Michael Nelson 48:33

Yeah, it's a mega wave is one of the things I've been fascinated with for friggin God almost since they started, right. So years ago, I was doing some training through Z health. And I talked to them a little bit about it. And then Landon Evans when he was on the West Coast, God probably early 2004 2005. Maybe I was out there in ACSM conference. And I was like, hey, you know, is it okay? If I just ask you questions about omega wave, like, Tell me your price. He's like, Well, you take me out to a good steak dinner. I'll answer any questions you want, like, perfect. So I drive all the way out like three hours at night. Take him to this nice steak dinner, we had a great conversation. And basically he was like, I can't give you the details. Because I had to sign basically my life away saying that I'm not going to tell anyone which I get I get right and so like, at 1030 at night, he's like, but I can test you if you want. So at 1030 at night, he takes me back to his place like hooks me up like to the full system and stuff. I ended up leaving their drive four hours back, like where I was staying. And it was fascinating because I'm like, huh, how the hell does this thing predict what my vo two Max is by looking at electrical signals? Yeah, right. And so for a while, I'm like, Well, this would be easy studied, quote, unquote, to run. So fast forward like they've actually the last couple of years have put out a lot more data than they ever have. The DC potential. I've used it I have the kind of the coaching version since

they've had that for years, and I'll be damned if like the DC potential does, at least in my experience appear to predict speed and power pretty damn well. And like if I have tried to do stuff in the gym that's more speed intensive just kind of brutalized my CNS, if that's such a thing, right and like, my DC potential will tank like the HRV on it. I can't ever get to move around much on myself. Maybe because my heart rates kind of lower. Other athletes I've tested like, it tends to line up pretty good. So when you're my good buddy, Cal Dietz has got like the full system. I'd like Jim ciders got one. Landon still has his, you know, if you talk to all the Aaron Davis and Texas, I think I probably know like, the people who use the full like the three to five minute test. And like all of them are like, yeah, it works amazingly. Well. So I don't know find

T Travis Mash 50:54

out you know, like, I would love to to take a deep look. I was so excited because upon entry into the program and starting the new weightlifting program. I thought I had lined up, you know, Jim aware and a mega wave and I'm like, This is gonna be so much fun. But then they just ghosted me. I think they're talking now to Eric Comtrend. Philip about working together with with experts. So sure up so I'd love to work with him. Yeah, I

M Michael Nelson 51:24

think crashing off was the other guy who's done a microwave stuff for years. And then other ones. Super crazy stuff. So yeah, a lot. Last I heard omega wave was trying to be sold to someone. So I think that was kind of where there's a lot of weird stuff going around.

T Travis Mash 51:43

Like we were in total green, that's everything. And then gust I kept kept messaging and then as I guess, they don't talk. But like, I mean, I've, I feel like I've done with Jim where we've developed best relationships because of how much I write about them and everything. But I would love to try that with him, you know, in where I'm at, in my career as a coach is this is that I have a few athletes that are actually the absolute tip top. So at this point, I need anything that will give me that last half a percent. Oh, totally. You know, it's the difference. It's a difference, you know, a gold medal and like fourth place, no minerals is so small, less than a percent. So

M Michael Nelson 52:31

I think a megabyte has been interesting, because even if you know, my bias that this is a guess. I think a lot of it may be entirely empirically derived. I think it's based on actual science and some of the Russian studies they did. But just think about the database of athletes and the amount of repeated data that they have. So even if it's all just correlated from doing measurements of athletes over decades, to someone like yourself, that is still super useful, right? Because if you could be like, Hey, this guy CNS is toast. Oh, wow. Let's test him before the session tomorrow. He's still toast. Okay, his HRV might still be okay. Right. And that's where I think it's interesting that if you have a CNS marker with those athletes that are kind of on the

fringe, like maybe their RSI score is like, okay, not amazing, not horrible. HRV is okay, their POM score, their other indicators are okay. But the CNS is like, no, he's trashed. Like, what do you believe then?

T Travis Mash 53:33

Yeah. What are your thoughts on that?

M Michael Nelson 53:36

I don't know, like the DC potential appears to map in my experience, and from other people I've talked to Chris Morris, I think is the guy who did his PhD years ago on fluid periodization, that used the mega wave, which was like one of the first times actually had data published on it. And it showed to be pretty positive and quite a bit of a difference. But then, like, you go into literature, right, and you're like, Okay, so let's say CNS fatigue is a thing. Well, what, what the fuck is it? Right? Are you looking at the studies where you've got the guy doing leg extensions, and then they take the little coil, and they stick it on the quad and they zap the quad to do more extensions and say, that's your way of quantifying, you know, CNS versus peripheral fatigue, because there's all these built in like, like safeties in the system, right? Because we know like, if you get on a leg extension, right, or biotechs, and you just push as hard as you can so volitional fatigue, and I'm yelling at you, and you can't do any more. Right? If I take an induction quote and set it on top of that muscle, it'll still fire. So which means you have the potential but then why are you not using it? Right? And then if you could, would your risk of injury just be like so sky high that it's not practical either, right? No, but what is that kind of safety factor? Do they have five more reps, 10 more reps. Half a rep, I don't know.

T Travis Mash 55:03

And like how close to each of those reps get you to injury, you know, like, exactly. So if you have 10 to join the five, like, you know, that is goes back to what the book was saying. And I mean, endure is that, you know, the brain shuts you down even when Yeah, yeah, you know, a peripheral, you know, indications are your good your brains like they're not for whatever reason. So that's the mystery that I'm talking about.

M Michael Nelson 55:30

Yeah, yeah. And I've even seen with HRV scores where they're, if they're really bad, like, I don't worry as much about output, but I worry about injury risks, because there's so much stress on the system that I'm like, am I if they get out of the session, and they ended up doing okay, am I training like a different muscle activation pattern? That's negative? Right? You know what I mean? Because I know that if you put a whole bunch of stress on someone who's not used to dealing with it, like their movements, probably not going to be quite the same. If it's an advanced CrossFit athlete, that's probably different. But it's powerlifter Olympic weightlifter, just general person lifting. Ooh, yeah. I don't know if I, I don't know if I want to take that risk. So now, like if I have someone pop read like on an athlete, for HRV, almost all the time, I'm like,

Yeah, you want to do a pump session? Great. Go to the gym, do a pump session, leave, take a walk, go sleep, make some food. Like I just for me and the athletes I work with. This is not worth the risk.

T Travis Mash 56:29

Right? Oh, so do you monitor with your athletes? Obviously. Yeah.

M Michael Nelson 56:35

Yeah. So right now I just primarily use the I fleet for HRV. So they do it first thing in the morning seated. I've got one guy who has obstacle course racer, he's doing it standing because his resting heart rates like 36 at night sleeping. Which is insane. Yeah, how's the most receded? And then I do have some athletes that have like an aura ring. So I'll pull all their scores on Monday. Look at that. Again, I'm just looking at like, time in bed, like any differences and trends. Don't use the HRV a lot of aura, because most of people I have their heart rates are relatively low. Right? So you've seen like, if you've got some parasympathetic saturation, as a complaint I get with emails, people like, Ah, I got the aura ring, bro. I'm doing my HRV. And it never changes. I can brutalize myself and nothing happens. And then I'm like, What's your resting heart rate? It's 39 at night. Okay, yeah, not much is gonna change that. Right? Because it auras collecting HRV. At night, they've gotten massive amount of parasympathetic saturation. So I'm like, just take an athlete do it standing in the morning. So stand up with the strap on way to one to two minutes, so your body reaches homeostasis, and then do the measurement. So that's the biggest thing I see. And then from there, I read other programs, but I try to get them to be a little bit more autoregulatory. But you're always I feel like initially I'm walking the fine line because I don't want to build up this like fragile mindset either. Like I have some higher level athletes. We're like we've been training them for one guy's a powerlifter. Six months, he gets a read. He's 12 weeks out from a meet. And I'm like, go to the gym and test your you know, a soft one RM don't get injured. Just see where you're at. He's like, what? You're crazy. Like, my HRV is red. Like, how do you feel? He's like, Yeah, okay, not horrible. Not bad, but not wonderful. Perfect. goes a gym, you know, that's like a, you know, close to a new training. Max is like, Oh, this is amazing. Great. Perfect. Right? Because I also want them to know that if you're kind of on that edge, and his average was great, right? So it was just a one off day, it wasn't like a week that was in the trashcan. That if you pop read the night before a competition, which you probably are going to love. Because you're stressed and especially if it's new. You're just like, Hey, bro, we were at that time we did that several weeks ago, what happened? I didn't feel so good. But I went to the gym and I got like, good, right? Good numbers. Perfect. You'll be fine. Right?

T Travis Mash 59:03

Because like, when you say like heart rate variability, I feel like, you know, when that gets off, you know, which system is it going to, you know, which system is gonna suffer the most is never going to be, you know, the anaerobic or, you know, are you talking? You know, because most of us, it's just the Cretan system. So it's like, you know, the phosphocreatine system, but like, so is it going to be affected? If you're, you know, the heart rate, variability shows stress? I don't know, what are your thoughts there?

M Michael Nelson 59:31

I mean, if you look at the literature, you look at prediction of performance off HRV like some of the endurance stuff is, is pretty decent, right? You know, if your acute HRV is off, and I've noticed this with training, too, is that endurance performance tends to suffer a little bit more. If you think about what a read or a high sympathetic HRV Score says. It says, Uh, you're high on the sympathetic side, right, like the worst thing I would want, especially for a powerless afterwards like a gross motor max output is I would hate for them to be like super parasympathetic before me. And then I've goofed up people before. And that's happened. And they're like, yeah, it's time for the deadlift, I want to go take a fucking nap in the corner. I'm like, they were so parasympathetic that they couldn't transition to become sympathetic. Right. So their break was so far stuck. Yeah, we just goofed the timing up. So I would much rather have them be sympathetic, because I can control the amount of work that they're going to do to not bury themselves. So maybe just like the take your lowest lift, like your deadlift, go ahead a soft one rm and then just walk out of the gym. Right? Because they'll probably hit that performance. But if I tell him, bro, go to the gym and do like a marathon three hour session. I know that's gonna be a fucking disaster. The next few days is gonna be terrible. Yeah, the next week, they're probably have to take a D load the next week.

T Travis Mash 1:00:54

Sure. So like, how do you get how do you teach your athletes to like, go, you know, to flip that from parasympathetic coming from sympathetic to parasympathetic. Do you use breathing a lot? I know. That's one thing. I try to do the mathletes but like Yeah.

M Michael Nelson 1:01:09

So I think like high level so you write Olympic weightlifting, right? You remember like the super old Russian tapes you used to see of Olympic weightlifting like back in the day were these huge sides of beef lumber out on stage that heavyweights I remember seeing one I don't remember the guy's name. And watching it. It's all grainy and shit. And you're like, Yeah, this guy looks like he's gonna sock but he's like the top lifter in the country. Like he looks like he's gonna fall asleep. The second he touches a bar it looked like he was gonna fucking kill seven people in a row. And then he clean and jerks New World Record members offstage. Like he's gonna go and take a nap. You're like, what? What did I just see? And what I realized was like, that's high level athletics, right? You watch a receiver run in the NFL safety, whatever. They're doing amazing shit, but they don't ever look like they're trying hard. Like they don't make it like the elite of the elite don't make it look difficult. So I think it's the toggling between parasympathetic, it's go time now you are massively sympathetic of you know, which you can control powerlifting more than Olympic weightlifting. And then you're back to being parasympathetic again. Alright, so good buddy of mine works a lot of NHL pros. He's like, the guys who entered the league who are massively sympathetic all the time. He's like, they perform great for about two to four years, and then they just blow themselves up. He's like the guys who, yes, then perform. And then like, I've worked on a couple of his athletes. And it's like, That guy's an NHL pro. He's sleeping in the corner. But like when you tell them it's go time, like, he's ready. Like, and we

would test them. He was ready to go. I'm like, he didn't do a warm up. He didn't do anything. He's like, Yeah, I'm ready to go. We test them. Like, everything's on. You're like, Fuck, no wonder you make 4 million a year or whatever.

T Travis Mash 1:02:59

Right? Yes.

M Michael Nelson 1:03:01

I think you can train that though. So I think you can take someone sympathetic. Yeah. And then you look okay, what are the levers I would use to drive them parasympathetic. So between a sense, I would tell them breathing. Alright, so get your breathing back to normal nasal inhale nasal exhale, longer exhale, right longer accidental bias, you more parasympathetic. And then you can play with eye stuff. It's a wider panoramic view is more parasympathetic, right? closer view is more focused, sympathetic. So walk around, imagine you're just sitting like try to have your gaze be a little bit more open. Walking has something called optic flow. Meaning, right, your brain is trying to figure out are you moving through the world? There's a world moving through you, right? Because all the peripheral movement triggers with the proprioception to say, Okay, I'm moving through the world. And that appears to be more on the parasympathetic side. So I'll tell them, like, if you're up to just walk around, get a drink of water. And then when you're ready to go again. Now you want to transition up to become more sympathetic, right? So maybe you sit like, I'll sit with my hands like this. And I'm just focusing on that point. And I'm just thinking of an external cue for the next left, right, I may do a couple fast breaths before I do the left and then it's time to go. Focus on whatever your cue is during that lift. From the second you're done. Like try to just bring your breathing back, get back to more parasympathetic again.

T Travis Mash 1:04:30

Yeah, you ever watch a code and the great power of Sir Yeah, always seemed so relaxed. Yes. And when I transition from being the crazy guy, to the relaxed powerlifter, I mean, that's what I became world champion, is when I looked at the world championships, the same as I did training in the gym, my my perception is what I have lately, is what I've learned the most perception of whatever it is, is the key is like perceiving the world championships. No big deal. You know, like lying to yourself until you believe it through, you know, visualization, no self talk, that was like, huge difference maker like, never really got excited at all until the debit, because like, that's the key, that's when you need that crazy man. But like, until then I was very calm, I was talking relaxed. And it was, it was the game changer and most weight lifters who do the best, are very relaxed, they're joking in the back room and warming up, you know, they were, you know, they're both going onto the platform. And they're literally telling a joke, as they, you know, that is the guy who ends up being the best and like, because he his body takes because I was the guy who literally outside of you know, competition, spit my all my time and sympathetic because I could never come down. I'd be laying in my bed like thinking about you know, wanting to win. And like it. So my career last week, you said about four years? Yeah. 2001 it started 2005 Basically, because of that very thing. I blew myself up.

M Michael Nelson 1:06:05

Yeah. And you see that in like, like Ed Cohen's a perfect example. Right. I mean, I don't even know if he had any major injury lifting hit a few, you know, Nick's and a few small things. But I've obviously had some stuff afterwards. But on the very end, he shot me just kind of said, That's it, I'm done. But that's the key, right? Especially in a strength sport, or Olympic weightlifting, we've got a high skill and strength component. Like you, you have to have the ability to endure like and you just can't, like I tell people, like if I have a three cylinder you go, can I get to the grocery store faster? If I redline it? Sure. Can I drive around town like I stole the car and expect it to last like a long period of time? No, of course not. Right now, can you get more? Would it be better to upgrade the engine to like a V six V eight v 12. And use less of the engine and get the same amount of performance for efficiency? That makes more sense, right? And then when it's go time, right, have that reserve of you know, power when I need it. And I'm probably not going to blow the engine at that point, either.

T Travis Mash 1:07:09

Right? So it's brilliant in ED told me that but the time when he told me, he was my competitor to I didn't want to ride, listen to him, but he was being my friend. You know, like, I just His career spanned What, like three decades of my free time. I didn't even last one my last half of a decade. So for anyone listening, relax, competition, that's a key.

M Michael Nelson 1:07:39

Yeah. And you see that with some new athletes that come up and you're just like, pick almost any sport, right? Hell even pick bodybuilding. Right? You see people come up, you're like, wow, look at that person. That's crazy. And you see the numbers and performance everything else. And it just appears like the steeper that curve is up like, like the the cliff on the other side, unfortunately, is just too steep. And they're like, what happened to them? They disappeared or fortunately passed away? Or, you know, God knows what happened at that point.

T Travis Mash 1:08:05

That's exactly right. So when you with your athletes with you, munch, I know, HRV is obviously bigger. What else? Do you what do you track.

M Michael Nelson 1:08:14

So I use offer like true coach, we just tracked lifting volume, we track just performance, any other notes you want to put in there, I guess that aura will track and that's about it right now, obviously, they're tracking their macros and their nutrition. And that's really about it, because I found that HRV has a context in it. So I will say, self report your energy, your nutrition, your sleep. And so I look at their score. So if they get like a red score, right, the first thing to look at is a context, like what's different. And they'll have a little note section where they can leave me notes of you know, you know, one guy couple years ago, couldn't figure out what was going on. Everything was fine. He's like, Oh, my dog passed away last night. Right? So HRV, obviously

pretty horrible. Like, just take the day off. Don't worry about it. Right. And so I find that the context, like you were saying, that's the key is HRV tells me what's going on. And it gives them feedback on their own body. Because what I've realized, and this is a realization for myself years ago, most people even high level training people assume that other life stresses that there's like different buckets, right? So if I'm super stressed out at work, and I'm stressed out of my mind, let's talk and affect my performance. And then when they start measuring that they're like, Holy shit, that makes a huge difference. Wow. I never knew that. And you're like, yes. But them seeing it and seeing the numbers was different than me telling them, right? Because I am sure you run in the same thing. Like, I when I started, I was like, Okay, I'm just for high level athletes. I'm only gonna do HRV and I'm like, why I'd like more data. So Screw it. I'll just make everybody do it. I said don't rules, you know, whatever. So for like, 12 years now. Everybody's been doing HRV What I realized was, Oh, if they're a high level athlete, I'm probably going to alter their training. Because they've done the recovery. They've done the things, they got sleep, they didn't go out till 3am in the bar at the training to probably push them a little bit too far. Cool. Oh, but for people who have a lifestyle, that's a life, they've got kids, they've got a job, that their lifestyle is probably the main thing that's kind of holding them back. They show up safely at the gym, they put in their half hour to an hour and a half, whatever. But I'm still probably going to alter their training because that is the most changeable thing in their life. Right, yelling at them and telling them like, bro, you just need to go to bed two hours earlier now. That's probably not gonna happen.

T Travis Mash 1:10:43

Yeah, when people tell me that I laugh my alright. Yeah, I'll tell my three year old to figure it out. Yeah,

yeah, go brushing your teeth, buddy.

T Travis Mash 1:10:53

Yeah, we do have to be realistic. And I see less with coaches, a lot of performance coaches miss that is like, there is there's what is perfect in this what's real. So we got to meet somewhere in between those two, you know, so

M Michael Nelson 1:11:06

have you found that athletes respond better to numbers than you just telling them something? Oh, completely. I feel like, I wish the matter told me that decades ago.

T Travis Mash 1:11:18

Me too, I spent a lot of wheels, you know, by not collecting data, if I just, you know, if I just done it, because it's so obvious. It's like, you got to before you know, when you draw correlations, you can look at performance, you can look at the things that happened, leading up

correlations, you can look at performance, you can look at the things that happened, leading up that performance and draw solid correlations is just math. It's not my, my what I think is so funny, too, with young men, young males, there comes a time where they they're going to challenge the coach. Oh, yeah, yeah. If you start young, they'll be fine. They're going to get that those teen years, it's going to start, and then we'll get the 18 to 21, they're going to challenge you. So if you're not prepared to give them answers, to get buy in, that's where you lose them. And so, you know, my athletes, you know, I've been with Matt, since he was 10, I've been wanting to for 12 years have been with this athlete with Wow, the other one almost a decade, like I've, so I've been through these phases. And now we're a new spot of like, they just complete biomes beautiful, but I had to do the work in to get the buy in. So yeah, we look at and really I don't know, I didn't go through. When it comes to the data, we look at also volume, of course, I'm looking at number of reps, you have to have number of reps to get a lot of these other variables I'm about to talk about the we look at intensity, average intensity, relative intensity, and then we look at like things like the k value, we look at that, on what is the k value, a k value, I'll tell you, it's my favorite. It's like a predictor. So if you can track your volume in your number of reps leading up to me, and then you get x result, say you total 300 kilograms, you're like, okay, in six months, I want to, I want to, I want to total 10 more, I want to do 310 On my total. So what k value is, is, this is a fancy way of like figuring out, there's a little correlation that you can develop, and you can figure out what I need to average the next time. So if I ever want to find some random number, you know, per rep, then I need to get the same number of reps average x or higher in a say like, yeah, it gives you a quantifiable number now to see cuz most coaches are just guessing they're like they got this result. So we'll do the same thing. I'm like, maybe, maybe not, if you're not careful, your average to see and enhance, if you just say my rep, if evidence is just change, then there's no there's no way that any adaptation will happen. So you do need to track it and we look at effect size. So I make sure that on any given day that I don't get I don't vary too much from the previous seven days. And then you can get a look at the numbers cute chronic, so I can make sure it doesn't vary too much from last 21 to 28 days whichever one you choose

to avoid any load spikes right?

T Travis Mash 1:14:16

Totally you know, you probably already do this I'm sure but like, No, we look at monotony and strain that's you know, support one like a lot of coaches who like you know, they did if you do the same thing day in and day out, like Bulgarian system if you max out every day, most research is going to say that you're going to whether it's, you know, you're you're going heavy every day with lower volume, or if you're going high volume, lower intensity, whatever. If it's the same every day, you're at risk of injury eventually. So and performance probably will not improve as well as if you have a heavy day light day, moderate high volume, low volume. It's that simple, but just just change change. sissies and loading. And like Mondays we go super hard, you know we do high volume Tuesday is, is light, Wednesdays moderate. Friday is like, it's high intensity, moderate, so we change every single day. So we avoid any kind of monotony and strain and simply looking at monotony with total volume is looking at the change in a standard deviation, and then the other one's looking at total. So,

M Michael Nelson 1:15:26

yeah, because it's just like, the issue you're running into is like, how do you get these dudes to lift a heavier load than they've ever lifted before? So I know that like via the said, principle, they have to practice that. But they're not walking around with 100% capacity every day. No, to do that. So what do I do that's a percentage, less that's gonna transfer to a heavier load. Even if I do that all day, I can, you know, beat their nuts in the ground by doing 90% of the one around every day for hours on end, either. No, no, what do I do to transfer to that?

T Travis Mash 1:16:02

But like, the key is, is start tracking. Like, you know, everyone, that's the biggest holdup, they're like, you know, they have all these questions, like stop questioning, just collect it. And then you can start looking and make decisions. No, one day one time, I think is a bigger trend nowadays, is you have coaches that have all this cool stuff. And they're using it, but like to track it, but like, what are you doing is a key? Like, are you able to make a decision on a very daily basis? Yeah, otherwise, what are you doing, like we make decisions daily, when I see like, you know, a depth jump, and it's 10% good, that I make the decision to like, we're gonna max out or we're gonna go a bit harder today. No, if it's the recent blow, like I told you, we're gonna, we're gonna take it to the house, and then we're gonna do the body and go home. But like, you need to know what to do is key.

M Michael Nelson 1:16:53

Yeah, and I've done even a little bit simpler method where I just drag volume and intensity. For lifts, I may do a little bit of density work. And then I just look to see like, what is a what's a transfer, right. So if I'm doing grip stuff, so I'm going to Saxon pinch bar did it the other day. If I got 155, I got five reps, which means that on a good day, I should probably now be able to hit 160 For a single, right. So for me that rep, that transfer of five pounds is about five reps. For like an extra lift, it's different, it's sometimes closer to seven or even, you know, 10 reps that a certain way before I can jump up. So but I know what it is, right? So I know that if I'm chasing just an acute volume at once, or I also know what is the total volume in a session, right, I may have to hit 40, or 50 reps in a session to then over time a couple of weeks later than bump up intensity again, the only way I know that is because it's for me, I have the data for my lifting. So I know that if, you know, Hey, I didn't get anywhere close to a high percentage of one RM today. But I did more volume on that lift than I've ever done before. Great. I know I'm making a positive adaptation towards my goal, because I can't do the exact thing every day.

T Travis Mash 1:18:09

Now. Now you have to make a strategic choice on a daily basis. Yeah, in one direction or the other. Right? So in weightlifting, it's like, it's such a, it's a chess match, you know, I'm pretty confident in powerlifting I can get every power from on Earth stronger, to a point, you know, where the genetic limitations catch up. But like in weightlifting, is so interesting, because, you know, like, I can get them stronger, the squats can go up, their poles can go up, you know, all

the lifts might not, it might go down,

T Travis Mash 1:18:43

could very easily go down. Because, you know, if I spent all this time getting your squat and pull up, I didn't do enough time on, you know, SNATCH and CLEAN jerking, which is that's the events. So it's a it's a fine line there. And it's another thing we track, which leads me to the point is like, we look at efficiency rating. So like, we look at like everything's based on the back squat. I mean, you could do it on anything doesn't really matter. You're looking at your anchor, right? It's just anchor. So they're really good, you know, front squat, compared to back squat, snatch, clean injure, all of it is related back and we look at you know, where are we efficient, inefficient, but you know you can do is take your data from the past and come up with as close to what's efficient as possible. Some people like a Nathan Dhamra, who has short femurs, the dude is going to squat a ton. And you're never going to get to that Russian beautiful number of x on this guy because he's going to squat 100 fast. He's not going to clean your 76% or 66% of that. Yeah, ever, you know, so like, what you do need to know is the individual you know, just to see if a guy has been training five years under Coach such as myself. He's going to be an efficient lifter he's gonna SNATCH and CLEAN JERK is going to look beautiful, you know, so but he is personal You know, efficiency rating, from back squat to stat? That's what you got to know. Because then I got to look and see, well, you know, Nathan, it just is incredibly strong. He might very well have a 50 pound increase in the squat in zero. No, you know, you got to look at other variables. But there are people who are like, who can literally clean insure what the front squat? Yeah, wow. Yeah, it's crazy. It's crazy. So that person just get on strong. But the key is, is you got to know the variables. Yeah, you can't guess. If you're guessing. You're definitely losing in this era in American weightlifting. Because like all the coaches, they're at the tip top. Now, it's a whole, a whole change in the dark. But every one of us is very good at collecting data and knowing what to do with it.

M Michael Nelson 1:20:49

That's awesome. Yeah, that's all I got for my buddy Cal deeds. So he was saying that all his new programs he does with track athletes, swimming athletes, like he doesn't do them on as hockey players. Because he's like, yeah, it's all time. He's like, I know if they got faster, right? i i Maybe I made a hockey player, female hockey player faster. But it's hard for me to tell that I make her a better player, I gave her more capacity, I can show you that her lifts in the gym are better. But did that translate to make her a better player? He's like, Yeah, I can tell you a sprinter right away if they ran faster or not. Right.

T Travis Mash 1:21:25

Right. I know. It's very hard. You train like a sport athlete, football player, baseball player, to know what kind of impact you know that we can have. It's interesting. You know, there are variables, I believe, if you're good at biomechanics, I think there are certain variables, though diamond, I can quantify it to see, look, I give you the ability to swing your bat faster. I know

that because you know, I had the data, but you still gotta hit the ball. So yeah, that's up to you and your baseball coach. I love teaching baseball. But you know, your your angular velocity has improved. So go do something with it. You know, I mean, like, yeah, I love mechanics.

M Michael Nelson 1:22:07

Yeah, it's, it's interesting, like I originally did my Master's in mechanical engineering. So I suffered through kinematics, biomechanics, all that shit. Like, initially, I was going to do internal bone fixation was going to be my original projects, but I never got funding. So I ended up having to go to the Center for Biomedical Engineering, they ended up doing heat transfer stuff instead. So I had to go back and teach myself heat transfer from thermo to heat transfer, one conduction heat transfer. But I wish I would have stayed more in the bio mechanics area to actually use it. But I've got to, you know, suffered through all the classes.

T Travis Mash 1:22:43

It's like something about biomechanics. It's like, I think the advantage of going back to school at my age because I've been so involved in athletics, and coaching, high level athletics. Now, when I'm talking biomechanics, it like immediately in my brain, there's an image of an athlete, Julian's talking about and I'm thinking to myself, what I could have done better. And so like, it just immediately clicks, and I merely take it back to my, you know, my athletes and go to work with it. Big advantage, man. So I would say anyone listening, you know, go coach for a while, then go back, it'll be much better. Because I listened to my younger athletes who are in exercise science. And like, they, they just don't get it. They, you know, like, I can hear the way they talk. You know, they're going to biomechanics, and they're just trying to survive, and like you guys, you know, but they'll have to figure that out. I'm trying to teach them but time, right, like, yeah,

M Michael Nelson 1:23:40

yeah, that's hard. Last question. We'll wrap up is, you mentioned flywheels. My bias is that I just got one of the K box, shout out to Essentrics. I didn't get any discounts from them. But I think they make high quality stuff. And the main reason I got is I kind of wanted it for years is that I don't do any Olympic weightlifting. But I know, as I'm getting older, my rate of force development is going to drop off if I don't do anything. And for me, like kiteboarding is probably my main thing. And if I screw up a jumping and dropped out of the sky, 20 feet like a sack of potatoes. What if you say you do what? kiteboarding? Oh,

T Travis Mash 1:24:20

yeah. Wow.

M Michael Nelson 1:24:21

So if I'm up in the air, and I screw up, the impacts a pretty high rate of force development. So I know what gravity is. Yeah, gravity thing still works. So I'm like, maybe it should just go I got

know what gravity is. Yeah, gravity thing still works. So I'm like, maybe it should just as I get older, do something like that. And what I found was like with the flywheel stuff, it's, at least I'd like your opinion is, it was a good way of creating force in a safe way, without worrying a lot about form, and actually even noticed that getting a little bit I don't know soft or different with the form was actually better on a flywheel. Like I could get away doing a high pull on a fly wheel and that it felt pretty good where if I do with a bar, I don't have the skill to do that, well, there was something about I have to exert force because it's pulling down. And then when I reverse it's doing the opposite. So I have this constant force vector I'm working against versus a bar has, you know, all the different mechanics associated with it. Right?

T Travis Mash 1:25:21

So I think that the fly will as got way more applications than people even though is is to say you're, I think you're totally right. My athletes that do it normally, I I've saved it at this point, because I only have one shout out to Kratos Kabuki is Oh, yeah. And he's coming out with one, it's gonna be even cooler, because we're gonna have ways to monitor velocity. And he told me the variables. So now it's gonna be even cooler for a guy like me, because he's gonna have some data points I can look at. Yeah, but let me give you some anecdotal evidence. I had two my athletes. The one being the best athlete I've coached in my entire life, Ryan Grendel and he's the one who like, right now appears to be on track for the Olympics 2020 For not only making it but potentially meddling. So one of the strongest, most explosive guys in the entire world right now. I put him on that for one week. And so one week later, his vertical went from 37 inches to 40 inches, nothing else changed. Wow, no volume changes, no weight changes, nothing else changed. And there was a three inch increase, well, then I started putting more and more people. And I've noticed exact same trend. It's been crazy, which is the key is how you do it, you know, because, you know, you can just do it, like guys like us can do it, you can get BurgerFi I think, I think it's hard to beat the, you know, the firewall for hypertrophy, simply because you got the speed or the centric, which a lot of people don't talk about, which has got a, you know, there's a high correlation to the speed of the eccentric, and hypertrophy, especially faster twitch fibers. And yep, so doing that the key would be the way we do it, is we find ways to overload the citric portion. So like you could do, you could do a two leg, you know, a bilateral, like RDL and then switch the centric to a unilateral RDL.

M Michael Nelson 1:27:20

It's like a two one type thing is like, right? Yeah,

T Travis Mash 1:27:23

that has been the big difference, you know, because, you know, we're thinking, I need to improve, especially the hip, knee and ankle joints, I need to, you know, I need to, you know, make those joints more elastic. And so it has been a miracle so far. So like anyone listening, I would probably at least look deeper. The key would be in the way you use it. Anyway, so. So yeah, I love it. I can't wait to get the new one where I can get, you know, some more quantifiable data points. Versus right now all I can tell you is like, you know, we just did X sets for this long, right? Who knows how much you know, force or power? Lead? Yeah, right. I have no idea. But soon I'll be able to put down on that. And I can have way more than just anecdotal evidence. But like, it's been really cool. Even like the RSI everybody that did it. There are their

RSS score went up. And you're talking about high level weightlifters? So like to have any kind of change? Oh, yeah. That's you? Yes. Well, you what you got to think about is elasticity. Because like you centrically especially, you're looking like Titan, you know, the protein film that's responsible for it, not solely

one of them with one of them. Right? Right. Yeah.

T Travis Mash 1:28:41

All I can say anecdotally is that something with the flywheel that speed, et cetera, there's a big there's a big difference. And especially for weightlifting, it was a huge difference for the one guy that it was the highest level I've ever coached. Which is even as you know, more dramatic. Yeah, it was a rookie, I could do anything. He gets better. Yeah, this this guy. It opened my eyes so like, the fly will not have ones definitely at least be looking into it.

M Michael Nelson 1:29:09

I think. Have you seen the new? I think it's from 1080 sprint, the machine they have that looks like a smith machine that's programmable with all rates of force development and everything.

T Travis Mash 1:29:20

No, but you can bet I will. For sure. Look it up. Yeah, but

M Michael Nelson 1:29:24

shout out to Cal Dietz I was one so I got to try it. He gets all the toys. I know. I was asking him like, that's pretty cool. Like, how much does that he's like, about 50,000? Like, no, not putting that in my garage?

T Travis Mash 1:29:36

Like, no, man. I'm not doing that. But you know if I can like work a bill with $1,000

to research on it.

T Travis Mash 1:29:47

I will. That's all I got for him. But tell me what is from who again?

M Michael Nelson 1:29:53

So have you seen the 10 at Sprint? I know that yes. Yeah. So same company, but they took the concept and they slider to what looks like a smith machine. Right. And what's cool is you can program completely independent concentric and eccentric, I think it might be electromagnetics. I'm not sure how it runs, right. So like you could do a very low eccentric. Yeah, you could do a fastI centric and have it stop at a certain point, you could have a do resisted concentrix. And it gives you all of the data and the feedback. You could have it be more quote, unquote, open ended where, okay, do a very slow eccentric and now create as much force as you can concentric and it will measure how much force was created.

T Travis Mash 1:30:33

I would deadly spend a lot time. Well, the key is like if you have an athlete who's not very elastic, I would never spend time on the cities. He said, Yeah, right. Right. Right. Right. Yeah. Which is, I think Cal DC is really the one that put me on this journey. I'm on what's read his book, try phasic training. You know, like, you know, all of us, none of us ever, like does exactly. We all got our Yeah, their own thoughts. But it definitely led me to start looking at those individually. And we definitely look at you said two concentric isometric. apart from one another. At certain phases. Yeah. Yeah. Anyway,

M Michael Nelson 1:31:12

cool. Yeah. So where can people find out more about you? I appreciate all your time. Today. You can

T Travis Mash 1:31:17

go to Mesh elite performances are mesh li.com is our website. You can go to messy performance on Instagram. But I really enjoy talking to people on Twitter, because it's it's small.

You still use Twitter?

T Travis Mash 1:31:31

I love it. Especially there's a lot of strength coaches on there. Yes. Like it's an audience that, you know, that's the people I'm working with. So yeah, get on there. And we have very to the point conversations, mainly about all these things. We just talked about how the monitoring gay people strong. No, say stuff like that. That's on Twitter. It's at Nestle.

M Michael Nelson 1:31:51

Right, and you do online programming for athletes then to through the company. Also, if people are interested, yeah, me

T Travis Mash 1:31:57

naturally calm. And we're, we're, we're making a transition not away from that. But the focus is going to be more on courses, like teaching coaches, you know how to I what I really want to do is I want to make the science easier to, you know, discern the information and how to apply it to these coaches, because they're already overwhelmed. Take a high school coach, you know, he's coaching 100 athletes a day. And then you're saying, hey, you need to learn physics? And if so, this stuff, yeah, I'm just gonna take the stuff that you need to know, make it digestible and applicable. So that's the focus of our company now. So

M Michael Nelson 1:32:36

yeah, and you also have a course, through stronger experts or buddy, Phil,

T Travis Mash 1:32:39

weightlifting, and I plan on working on an athlete monitoring course, this everything we talked about, trying to make that information. Easy. It was, there's a course at an Orion University called Le myosin is unbelievable. But you know, you got to pay some dorium, 1000s and 1000s for this course, with someone like try to make it at a better price point and easier to digest. You know, take away take out all the stuff that I didn't need and leave the stuff I did. And so that that is what's coming next is athlete monitoring.

M Michael Nelson 1:33:13

Cool. Yeah. Awesome. Well, thank you so much for all your time today and enjoy the Arnauld Good luck to all your athletes there. And again, really appreciate the time I learned a lot and thank you for sharing so much with all the people listening to I'm sure they really appreciate it which is great. Are you going in? No, unfortunately, I'm not I we've gotten the past Well, we haven't gotten into COVID years but we went a couple of years before and it's always fun like I like it but at the same point I only go if I know people they're competing and right. Like I stay out of the Expo on Saturday and it's just it's fun just to see people but once you've been to the Arnold multiple times, like it's it's kind of the same unless you know athletes are competing and stuff and yeah, the last year I was out there, my buddy Ben Pakulski called me on Saturday he's like, hey, just want to come down and do a podcast and just hang out we're like sure so we just went to his Airbnb did a podcast hung out with him Saturday afternoon and avoided the expo no one I knew was competing. We saw him compete in the morning and right so it's fun but not gonna make it this year.

T Travis Mash 1:34:16

We just have like competing or I definitely would not go so crazy. That expos like Yeah,

M Michael Nelson 1:34:25

yeah, I remember one year I had to do a talk for EA there. And I gave myself a half hour to get from one end of the expo or cross upstairs to where the room was for you. And I thought I was gonna have like more than enough time but I'm like trying to Saturday and I was an idiot went in there got stuck on the other side. And it took me 25 minutes to get to the room. I was like, Oh my God.

T Travis Mash 1:34:45

Yeah, man. It's insane. It's like 300,000 people in that convention center. It's like the the population of Columbus Ohio increases 300 I don't know what it will be you know, cuz this is the first one Since COVID, yeah,

M Michael Nelson 1:35:01

probably a little bit less, but in the past.

T Travis Mash 1:35:04

Yeah, I hope we don't. It's gonna be a super spreader. Exactly. Yeah. I mean, not me. I just had a few weeks ago, so I'm good now, but okay. See your world? Out? Yeah, you're screwed. Yeah. I'm good. All right.

M Michael Nelson 1:35:22

Yeah. Awesome, man. Thank you so much.

T Travis Mash 1:35:25

Thank you so much for having me on.

I appreciate Oh, no

M Michael Nelson 1:35:28

problem. Thank you so much. I appreciate it. It was fun. And yeah, any questions or anything I can help you out with in the future? Let me know. Appreciate it.

T Travis Mash 1:35:35

I'm sure I will be reaching out.

M Michael Nelson 1:35:36

Thank you, man. Thank you so much. We'll see ya see. Big thank you to Travis for taking all the time today to talk. really thankful for him and all his input. Super excited for all the work that he's doing. On monitoring there have very high level athletes, which is exceedingly rare in the literature. I mean, I've done unpublished work on exercise, testing energy drinks, etc. But that was with recreational athletes. And mainly it was because I didn't have access to high level athletes. If I went over next door and talk to my buddy Cal Dietz and said, I wanted to borrow 16 weeks of his high level athletes and divide them into two groups and do some crazy customized training, he would tell me to go get lost, which makes perfect sense because his job is to take those athletes and get the highest results possible safely in the shortest amount of time. His job is not to help me finish my PhD now at that time. So it makes sense that having a dearth in high level athletics, unfortunately, is more common. So it's great to see more data being created by Travis and some other people I know out there looking at high level athletes. And I think the greatest area that we'll be looking at that will be primarily monitoring, because that allows you to not necessarily make wholesale changes to their program, but still get more information about how to effectively train them. So big thanks to Travis, check out all of his stuff there. You can also find him on the Barbell Shrugged podcast, my good buddies, Anders and dogs, I always enjoy listening to that podcast too. And this podcast itself brought to you by physiologic flexibility. The fist flex cert will open again in early April 2022. Go to physiologic flexibility, calm, to get on the waitlist and the newsletter to be notified as soon as it's open. If you enjoyed this podcast, please share it with some friends. Leave us whatever stars you feel is appropriate and a nice little review because that helps us out a ton in the old iTunes ranking. And then also subscribe and download it. Thank you so much. Again, really appreciate it. I know you've got a ton of other podcasts and things coming at you to listen to. So I really appreciate your your time to listen to this one. And we will talk to you again next week.

Hey, was the worst thing I ever heard. It was terrible. Horrendous Well, it wasn't that bad for the person that I liked. I liked a lot of it was good. It was great. It's wonderful. Bravo