[00:00:00] **Dr Mike T Nelson:** Welcome back to the Flex Diet Podcast. I'm your host, Dr. Mike T. Nelson. On this podcast, we talk about all things to increase muscle performance, improve body composition, increase your longevity, do all of it without destroying your health in a flexible framework. Today on the podcast, I've got my buddy, strength coach James from Frontline Conditioning, and we are talking all about just that.

Conditioning and aerobic development. And this time it's geared a little bit more towards Brazilian Jiu Jitsu, BJJ, Mixed Martial Arts athletes, although we do cover a wide variety of topics. We even get into some fuel system stuff and break down some specific protocols you can use yourself or with your athletes, including my favorite go to interval setup that I don't think I've ever published anywhere.

And I stole it from Buddy, but I make sure to give him a credit in the podcast too. So if you want to learn all about aerobic conditioning, even if you are not doing Brazilian Jiu Jitsu or mixed martial arts, a lot of the principles that we talk about are going to be very similar for anyone who is lifting and wants to do aerobic conditioning at the same time.

So I think you'll enjoy this podcast and this is brought to you by Tecton. So if you're interested in trying an exogenous ketone, which I know sounds crazy, it's a ketone molecule that you can consume as a supplement. In this case, what they did is they have a unique molecule, which is a BHB, or beta hydroxybutyrate, which is one of the ketones themselves, and then it's chemically bonded to glycerol.

Glycerol is actually just the backbone of triglycerides so fat. So it gets cleaved off, and the glycerol goes and does its thing, which can be converted into liver, and then you've got a ketone floating around your bloodstream. So far on the data I've seen, you can't just consume the BHC molecule by itself.

Everything I've seen so far shows that it doesn't make it past digestion. You basically just whiz it out. So that's not good. So with this unique ketone, blood levels of ketones go up, and I personally like using them for a little better brain function later in the day. Especially if I've been really busy on some cognitive tasks.

I've been doing a lot of writing and tons of deeper work, I guess you could say, lately. I find that they're quite beneficial for that. Each can has about 10 grams. I usually find a good dose is 10 to maybe 20 grams if I'm really dragging a little

bit. And the nice part is it's not a stimulant, so I can use it later in the day, and I don't feel like it's going to mess up my sleep in any way.

You can get ketones without having to do ketogenic diet. So check them out. I am a biased cause I am the scientific advisor over there at Tecton and I am an ambassador. So I do make some coin if you decide to purchase, but go to the link below and you can also get a percentage off too, which is great. So far, everyone seems to really enjoy them.

And if you have any questions, be sure to let me know. Also, this podcast is brought to you by my daily fitness newsletter. Go to MikeTNelson. com and you will find a box there where you can get on to the daily newsletter of all sorts of great information. Try to make it applicable and, as best I can, somewhat entertaining.

I don't know. Some of them are better than others, but I think overall it's pretty entertaining, which gives me a wide variety of topics to write about. And it's also fun to make them interesting. So you can go there. It's free. Go to MIkeTNelson.Com. Go down below. And you can hop onto a daily newsletter with probably like 80 to 90 percent of my content goes out directly to the newsletter.

So sign up there. It's free and you won't miss out on anything.

[00:04:27] **James Tognarini:** What up to you?

Well, right now everything's going pretty well.

Still in strength and conditioning coaching the gears have shifted pretty heavily towards combat sports, jujitsu, grappling, stuff like that. Which has been a lot of fun because it's, what I'm doing personally for myself and then how the brain works as soon as I started getting into that and chatting with some of the athletes there, like already the gears were turning of okay, well, how can we do something a little bit different here and make the the athletes a bit better.

So for the last couple of years, it's been primarily grappling and combat sports athletes that I've been working with now. Nice. So it's been, yeah, it's been super cool. And it's a really cool point in the sport too, because it's starting to get more and more popular. Breaking from like the traditional ways of doing it

and it's gaining a lot more popularity a lot more people are doing it You know, the competitions are getting bigger.

There's money in the sport now and so all these things are advancing except for You know the training and the nutrition stuff that goes into it Everyone is still doing like those like traditional style, you're one coach That you got that lies like your main coach for technique is like the no also is your coach for everything else And so what they say goes so it's been a lot of fun these last couple years delving into how can we apply?

Stuff that we've been doing with other athletes and as exercise science progresses itself into this sport as well, which is really I thought would have been a little bit more straightforward than it is. And that's the reason I reached out to you too. Like it's been a little while that I've been meaning to reach out and get my ducks in a row in terms of, what would be cool to explore.

[00:05:51] **Dr Mike T Nelson:** Yeah. Yeah. It's, I almost feel and I hate the comparison to CrossFit, but I'll make it anyway. I feel like the average person who does mixed martial arts, jiu jitsu, whatever, just goes and does a lot of technique stuff, not too much else. And then they just complain when they get broken.

And then the moderate kind of level people just like you said trust a single coach for everything even though The elite guys don't do that and I get you know that it might be a time commitment might be a financial commitment, etc But they could at least acknowledge that would be a better route.

I don't know. It's weird Yeah,

[00:06:30] **James Tognarini:** and I think like I mean to that point I think it's getting better though Yeah, definitely. It's definitely getting better, but you're starting to see it's really You It's like pulling teeth to a certain extent too, right? Because the funny thing when it comes to jujitsu in terms of grappling sports is that it's still considered as like the lazy one of the sports, you compare it to wrestlers, whether it's like freestyle, folk style, Greco Roman, whatever.

And these guys are fucking animals. Oh yeah. And conditioning and strength training is a legitimate part of their sports. Whereas jujitsu is one of those things where I still, On a regular basis, whenever I speak to like new people coming in that want to consult with me or whatnot, and I asked them what their goals are, it's just consistently time and time again, where the word that keeps coming up

is, oh, I want to be athletic man, you're competing in a sport you're technically an athlete, it's interesting that becomes the main goal.

[00:07:17] **Dr Mike T Nelson:** Yeah, I agree. It's yeah, it's an interesting development. And I think now you're seeing that. At least a little bit that I've seen at a higher level, you're starting to see splits within teaching methods of how things are being taught. And I, again, my bias, a little bit that I know is that I think the future will all be a constraint based problem solving model, right?

So like the ecological type thing, like friends, Bosch, and my buddy, Sean Mishka has done a lot of this stuff with NFL players and You're basically just setting up the constraints and here's the objective. And then you have to figure it out within the confines of the rules. Instead of, yeah, so you need to know basic technique.

You need to know yeah, all this stuff is good to know, but at a certain point, I just think my gut feeling is, and again, I don't do much in this area, so who knows if I'm right or wrong, I just think that's a better model. But not too many people are doing that yet.

[00:08:16] **James Tognarini:** Yeah, it's it's so funny. Yeah, because that is like a big debate in the skill acquisition coaching space in Jiu jitsu as well, right?

Exactly that it's ecological approach ecological jiu jitsu versus, your traditional Do you just drill a move a bunch of times or do you work on the context in which you might want to? Apply one technique or the other right and so That's, again, and I, it's, I find it so funny that you see the advancement in one aspect of the sport where they're really trying to pull from, what's working really well in terms of, yeah, coaching and skill acquisition in that sense, and building, a better brain and learning how to do these things as athletes and yet again, though, from the other stuff that's, that we know already, which is, the nutritional aspects of it, strength training, to a certain extent, because it's athlete dependent, but that stuff is often ignored, which is so interesting.

Yeah.

[00:09:03] **Dr Mike T Nelson:** Yeah, it'll, I don't know, it'll be fascinating to see what goes, because the beauty of it is, it's A tested sport meaning at some point if one group of people is just mopping the floor with the other group then At some point you have to acquiesce and go. Yeah, that might be better

We're not

at that point yet.

But you know if that happens if it ends up being that simple

[00:09:29] **James Tognarini:** I think that I don't know. Yeah, exactly. I think simplicity. I don't know if it'll get that simple But I think that you'll see some standouts One way or another and like my opinion of it is just you know, if what I see and this is anecdotal Right because it's just based off of a lot of the guys that i'm training.

Just in terms of how much more they can get out of their training volume on the mats just in terms of like understanding, you know that you can't redline every single day and it's not like a Who's going to carry the boats kind of deal of work yourself into the ground all the time. And there's, there could be an actual progressive approach to the training volume, even if it's sparring and time on the mats and stuff, but it's finding time for both of those things.

Cause the other part that is really interesting is that it's still such a like strength. It's still such a demanding sport on your body, like muscularly and strength wise too. Right. So even when we talk about training volume and lifting volume, There's always this delicate balance between, if you're going to do a double on that day, you're going to lift at some point in the day and then, go spar or do some sort of technical work that's still volume that you're getting, that you're getting in on that, on those, on that muscle tissue too.

Right. So that's going to affect your overall ability to recover. And then, how many sessions can you possibly get into that range? And so it's finding that happy middle ground, which is really the, I think that's going to be like the main thing when you can, when we can figure out a way to.

measure and manage that volume in a pretty accurate way. I think that's going to change a lot.

[00:10:53] **Dr Mike T Nelson:** Yeah I agree. My bias is most of it. If you're following like a eustress model, I'd be super curious to see how far you could get with an intelligent lifting program, like decent nutrition, good conditioning, and then just a lower heart rate skill technique work with very short bursts of.

intensity just to know what you need to drill, right? So like when you add more stress to the system, like where do they fuck up? Right? Oh, yeah, you keep making this mistake. Like you can do it like a, low heart rates. But when we add more stress, you crack over here. So let's just feed that back this way.

Instead of it's all sports, right? Instead of like basketball Oh, let's just go play another pickup game. It's let's just go, let's roll again. And I don't know it, it seems like a lot of times it just devolves into this moderate level training. This happens with endurance athletes.

That happens with weightlifters. It happens with all sorts of lifters. Everyone just collapses to this middle. Thing and I think you'd do better with more of a polarized approach

[00:12:03] **James Tognarini:** I so I'm 100 I agree with that entirely The difficult part is finding out how to still you know Get people to understand that you'll still see progress that way If not, you might even see better progress that way because the issue that you know i'm having right now in terms of building some programs and you mentioned it hit it with the heart rate zones, Is that it's hard to, it's hard to manage that style of training because of the fact that You know if you're fighting or if you're sparring with someone who is even if it's the same weight class We'll just keep the the concept like that It's in the same weight class if that person is a lot more skilled than you then they're 70 Might be your 90 just because you're going to be constantly having to exert more and more effort Less efficiently just to try to defend and defend and defend and try to like, Fight for a dominant position or something like that.

So the heart rate stuff is so interesting because like now there's, we want to figure out a way to improve their conditioning and their capacity, but it's so hard to keep them in that same zone all the time. You get that heart rate drift in every single training session, almost, even if you're trying really hard to keep it in a moderate zone.

[00:13:05] **Dr Mike T Nelson:** Yeah it's hard. And the worst condition you are, the worst it is. Yeah. And then, in a perfect world. I would have the person who's at 90 percent see if they can go down to 70 percent and then figure out some way of altering it, right? That may not be beneficial for them but it'd be beneficial for the other person because so could they trade with someone else and have it be So you're prioritizing one person over the other, right?

Because you're never going to have them like lining up unless this is outside of competition. Yeah, so it's like you go, I go type thing, but making sure that they try to scale to the same level, which means you have to check your ego and, be able to lose and all other stuff without devolving back to the middle of, ah, I gotcha.

[00:13:53] **James Tognarini:** Exactly. Yeah. Yeah. At what point can you keep people away from the, just, I just want to be alpha at this point, then just show my dominance in one way or another. But it's the, one of the interesting points that I you know, one of the reasons I wanted to set this up and speak to you about this is just because I've noticed so much of your content also, and like being centered around, the aerobic training, aerobic to cardiac development stuff.

And I thought it would have been super interesting because in a sport that's non traditional in the way that most like field sports or track sports, athletic sports are done. Even working even outside of the mats trying to work on building that they're, a conditioning or cardio up it's it's something where I'm trying to feel like if we don't have that perfect system where we can pair people together And get others to really recognize where they should be in training to get the most out of it You know, what's your approach on?

training outside of that? Are you still using heart? Do you think you would still use heart rate zones to train that? Or would you use your, your classical cardiac development stuff that you've been doing, or do you think that the approach has to be different too?

[00:14:55] **Dr Mike T Nelson:** I would titrate it based on heart rate variability and what their goal is.

The first thing is if their VO2 max is really low, whether that's a 2k, a 12 minute Cooper run test, an actual metabolic heart, whatever. If it's really low, then the reality is anything they do is going to help, right? And probably lower intensity is going to be good because every time they go to roll, they're just going to get their ass handed to them.

They're going to get smoked, right? Like their intensity as a percentage of their max is just going to be high all the time. That would be my guess. Unless you get into a really good environment, you could control that, etc. So you'd have to default to more, Zone two, even like cardiac development type stuff.

I would still try to sneak in one interval session a week. That may be, like, I've had people just real simply, I've even done this for myself. Like, all I want you to do for your high intensity work for this week is after your lifting session, just literally do one RPE of a nine 500 meters on the rower.

That's it. That's your high intensity stuff for the week, and that's enough surprisingly to keep some pretty high intensity stuff okay. You're not going to

gain a whole lot, but you're really not going to lose a ton unless you're really highly trained. After that, I would say it depends upon what are your goals, and at some point you have to get someone to buy into what is their priority.

Right. So if their priority is really aerobic development, the biggest mistake people make is they're like, well, I'm going to cut my calories. I'm going to really roll hard this week. And I'm going to do like this six week intensive camp or God knows whatever else they're doing. No, you actually have to, make it a priority because you need to do enough low to moderate intensity stuff for a good base.

But. You have to do some pretty high intensity, really horrible shit, but that's only about once per week and it has to be at a high enough quality and you have to be able to repeat that. And what I found is if your calories are real low, your recovery is bad, like you just can't do the work as much to move the needle.

Like you get pretty far doing, cardiac development stuff and maybe some zone 2 stuff, but at the end of the day, like you, just like lifting. Right? At some point, you can do as much volume as you want, but you have to blend some intensity level in with it. And the more advanced you get, you got to turn up the dial on intensity too.

So same idea.

[00:17:14] **James Tognarini:** Yeah that's great. Because that was going to actually be like a follow up question that I had was, do you look at it the same way as you would strength training? Where you have to dip into different intensities to get something out of it. Like you said, you can't just do volume all the time.

At some point, you have to push that intensity a little bit. And I agree with you too, in terms of if you're. If you're VO2, and I do a VO2 max test with everyone. I always, I like the 2k test. I think that's great. And something that even, that stood out too from even the presentations that you did back when we were in Costa Rica, like the physiological flexibility one, I'm pretty sure you had a list of your anaerobic test, 500 meters on the roller, your 2k road test for the VO2 max, and then that 20 minute aerobic one.

No one ever wants to do a 20 minute road test. Oh no, this sucks. This is

[00:17:54] **Dr Mike T Nelson:** horrible.

[00:17:56] **James Tognarini:** No, and and the worst part is, they're definitely not going to fucking pay me to just do a 20 minute road test, so, I'll always stick to that 2K road and 500 meter, and then see where they're placed in there.

But, at the same time, I'm I have this kind of same philosophy where I'm trying to work on this from the bottom up anyways, right? Everyone is willing to do that, those like really intense intervals, because it just feels I'm doing hard work, then I must be getting better all the time.

And no one really wants to do the stuff that they feel is not going to be hard, but it is, it's challenging to do the cardiac development stuff often too. You can still build up quite a bit of volume on that, so I've always had this sort of like bottom up approach where we're going to work on the aerobic base, we're going to try to build that VO2max up as much as we can because there's not I don't know how much you've seen improvements happen in VO2max over, over a training period but I know we're not like doubling it.

You know what I mean? Like it's going to, it's going to go up by a few points, but it'll still be noticeable. You'll, they'll still notice a difference in that. And then side by side to that, one thing that I found too, is as we increase their strength, your point too it's almost as if you're working at, you're, what used to be a tough pace for you or a tough round for you, as you get stronger and more aerobically developed, that just becomes a lower percentage of your maximum.

And so, seeing the improvements there also which is really cool, but then it always, the question I always get asked too, is talking about energy systems, because, People feel like it falls, it falls into the same thing where we're using fuel depending on, our heart rate zone and all that.

And so I don't know your thoughts on energy system specific training in terms of the same way you would do whether it's volume accumulation phases or intensification phases for strength training, or do you prefer to just keep it at that same thing where I want to build that aerobic base as much as possible.

And then we're going to start putting in a little bit of high intensity and maybe even kick up the volume slowly and then dial it back later on.

[00:19:38] **Dr Mike T Nelson:** Yeah. I view it as. Number one, do the training first and then worry about the state of the training, right? Cause like usually when you get an energy system, people are like Oh, well, this was supposed to be burning fat.

And oh my God, the only time I have to do it is after lunch. And so I'm just not going to do it now. That's no, just still do it. Like even if it's zone two stuff, like if you can't do it fast, that it's not the end of the world. Like you're still going to get out of patients from the training.

Now, again, if you asked me my preference, I would say with lower intensity stuff, I think the more fasted you can do, I do think that is a little bit of a benefit. From fatty acid, fatty acid oxidation, fat use, that kind of stuff. Is it going to be a deal breaker? Ehhh. Depends on how bad you suck at that area.

If your VO2 max is already pretty high unless you're I have seen some freaks who don't have a crossover period with a really high VO2 max, but that's usually not the case. Usually if you look at literature, like the higher VO2 maxes, the more like your ability to use fat generally is better.

Again, massive amount of variability there. So I'd say, do the training first, get an intelligent program, follow that. And then if you can separate and move stuff around to be better, then, do that. I still like moderate to low intensity stuff, first thing in the morning semi fasted.

That would be my preference, because normally that's going to be away from your other training. You're not going to affect the quality of your training. If you need three hours to recover from zone two, like you probably need to be checked for other issues or your zone two is off. Even if it's like 10, 15 minutes of cardiac development, like you should be fine for a lifting session in the afternoon.

Again, yeah, you can overdo it on it, but but if you can't, then you have to be a little bit more careful, I would say with matching the intensity to what you were doing. So if you were doing a bigger weight training session, maybe one day you're just doing a 500 meter row after, or just a progressive six minute row.

You probably don't want to do a huge zone two right after you're lifting. I don't know. I guess you could, but it comes back down to preferences, what you need to develop, what can you fit in. And the reality is, most people are not going to do two to four hours of zone two. So, I don't, in a perfect world, if your VO2 max really sucks, should you do that?

I would say yes, six to eight weeks. You're not going to see a big improvement in VO2 max. People hate it. It's boring. Does it help? I think so, but I've had better luck just doing, if they're moderately trained. Just doing more cardiac

development stuff, which is a moderate heart rate for 10, 20, maybe 30 minutes on the outside and then adding some high intensity working on top of that.

I'm not even sure if I answered your question.

[00:22:20] **James Tognarini:** No, to be honest with you, it's, you did that because really the questions too are just like it's just probing into this sort of new space for it because to your point it's hard to, because the sport makes it hard to nail down, heart rate zones in the way we compete and because there's no, unless you're again, unless we really build up such an aerobic base, even in competition, it's going to be very hard to keep that heart rate low.

Or at least in a respectable place unless you're super, super well conditioned just because of the fact that you're fighting another human. And so regardless of being stressed about that in general, in the adrenaline dump, there's still always that aspect too, which is also a huge factor.

And this is like, how technically efficient are you

[00:23:01] **Dr Mike T Nelson:** because

[00:23:01] **James Tognarini:** the more technically efficient you're going to be, then the less energy it's going to cost. And so your heart rate's not going to go up as much as a consequence of that. And so, you're always fighting and this is like the tug of war that we have with the traditional style of coaching is that are you better off just getting better at the sport, and doing specific stuff with that, and then you won't need to be as well conditioned. And then my, objection to that is always you're never going to lose out as an athlete on being more conditioned and stronger. No, it's just going to help you. Even if it's just from like an injury prevention standpoint or just in terms of longevity and being able to train a lot more.

But we have to, we have to get them to sign up, to do that work. A lot of guys that I see now will maybe dedicate two or three days to training outside of the mats. And then that also limits the, what we're able to do in that time. And so we have to be very specific and then even in the tests, right?

So like I had mentioned, what, from your presentation, the 500 meter 2k and all that I don't know if there's any other tests that you generally use now for athletes that are always in that sort of like glycolytic zone, 85 percent or more kind of heart rates is if there's something even to test for that.

[00:24:07] **Dr Mike T Nelson:** You can get fancy, like there's an expanded version of that from tenants today, where you include. Lactate stuff. So 30 second lactate, 60 second lactate, 180 second lactate. I had to do the 180 second one with a busted rib for when we did it for the Kerrigan Institute. I had to do it in front of everyone else because we weren't sure we could poke people's fingers because we didn't have a license to do bloods.

But since I was faculty, they're like, Hey, you should do this one. And the hardest part about it is it's bad enough. It's three minutes, but it's literally three minutes without pacing. It's literally get on and go as hard as you possibly can for three minutes. It's Just and then when you're done Like oh my ribs are killing me and then when you're done, they got to poke your finger for lack of it You got to sit there and not move at all is yeah, but those are Useful to see how someone's going to do under higher intensity stuff the big mistake people make with that is if they haven't trained it, they're probably going to suck at it but again, if your aerobic base is bigger like you do something with a Pretty good movement efficiency and a big aerobic base, and whether it's CrossFit, BJJ, whatever.

And you said, okay, they have to do something that's relatively glycolytic, they're going to use a lot of lactate, there's going to be, two to five minutes in duration, but it's been pretty, pretty hard for that time period. I don't know, three months, I could get them in pretty decent shape. The caveat there is if they have a big aerobic base.

If they don't have a big aerobic base, I don't know you're out. I don't know what else to tell you

[00:25:41] **James Tognarini:** Yeah, it's that starting point. I think is everything too, right? And that's where I see like the biggest improvements in the shortest period of time because the aerobic base I feel like takes the longest It takes the longest to develop and it's the most boring to develop too, right?

So that, you gave a bit of a timeline of three or so, three or so months if they have a big enough aerobic base, but in your experience, if they don't, and let's say you're starting from that ground up and we've got to do that cardiac development and we've got to build up that VO2 max. I only use because I'm only allowed to because in Canada there's no way I'm pricking anyone's fingers. I'm 100 percent getting sued. So, even for that lactate, I've always played with the idea of oh, I'd love to do something that's like a lactate threshold test. Because yeah when we're glycolytic at that point and it's anaerobic and they're

using lactate for fuel there, there's going to, I'd love to see where they're at and how we can improve that.

But there's no real way to measure. Measure those values. I don't even know if the test is even worth it at that point, if I can't actually test those values.

[00:26:34] **Dr Mike T Nelson:** So what do you can do? The next best thing would be still use the output from it. Use heart rate and then either use like a Knox device or a Moxie.

That would be like the second best way. Cause those are both nears and they're not invasive.

[00:26:48] **James Tognarini:** Yeah. Okay. That's true.

[00:26:50] **Dr Mike T Nelson:** And that'll give you some idea of what's going on at the local muscle level. You're not looking at metabolite spinoffs, but. And you can also even get even more fancy. There's some devices now that'll check respiration non invasively.

So you can get pretty damn close. Like I don't do really do lactate anymore. I don't even know if I have a working lactate meter anymore, just because it got to be a pain in the ass. It was hard to repeat. No one really wants to do it. The strips are expensive. It's cool to do, but there's a weird funky inverse relationship too, between people who are untrained and people who are trained because it's just like blood glucose.

When you're looking at lactate, you're only looking at what lactate appears in the blood and we're using lactate as a surrogate marker for hydrogen ions So we're really interested about hydrogen ions, but we don't see how much lactate is coming in We don't see how much lactate is going out

Yeah

So if you look at like George Brooks's work like the lactate shuttle in short other Kind of non working or less working muscles can actually burn lactate as a fuel So, and someone who's very untrained and someone who's at a very high level, you can't really compare their lactate levels.

If they're somewhere in the middle, yeah, maybe, but again, we have to keep in mind that's only telling us what the blood levels are. It's useful. But again, if you push me and said, okay, you can get a lactate level or you can get an output

from a 60 second wind gate. I would take output every day of the week, right, because that's what really matters.

If someone is able to do a higher average output over 60 seconds, who cares really what their lactate was unless you really try to get into specific training, they were better. So that's job one.

[00:28:35] **James Tognarini:** Yeah, I think that's great too. Cause you were always trying to show that something is getting better.

Right. And it's and the applicable level of like you, that's what I love about the road tests also. I don't really have a wingate device for my bike or whatnot, but. It's cool to see, the actual numbers go up and to a certain extent, like the one thing I keep in the back of my mind too, the first time someone does the test versus, the next time we retest, there's also a bit of, there's like a learning component to it also.

Right. And they understand a little bit more how to pace themselves to a certain extent for the VO two max one. But again, whether they save themselves an extra 10 seconds or so, like the. Overall, the O2 Max score is not going to really move but at least they feel like they're getting a little bit better too, which is important.

Yeah.

[00:29:15] **Dr Mike T Nelson:** Yeah. And I always give them the option, which is funny. They're like, Oh, well, like I, I completely paced that wrong. I went too fast at the beginning, I should have, I'm like, all right, cool. Like you can do another max test in two days if you want. And it's a true max test when they're like, Oh no.

I don't want to do that. I don't want to do that. Yeah, exactly. I feel like, yeah, bro, I'll do one tomorrow. I'm like, you didn't really do a true max test. And yeah there, there is some learning effect, but it's, and I've had people do that. I've had one person do it three times in a week. They got a little better, but it wasn't massive, right?

Because they goofed the next time they went too slow at the beginning, and they tried to make up for it at the end, and they just were so fatigued, they couldn't make it up. So you always, it's funny, it's just like, When I used to teach snowboarding, everybody thought they started with the wrong leg in front just because it was hard.

Everybody thinks they did the wrong pacing technique, and there is definitely a pacing technique. There's skill, there's learning effects, there's all that stuff. But, In my experience, it's not quite as big as what people think it is in their head.

[00:30:18] **James Tognarini:** Yeah, I can see that. I can definitely see that too. And even if it is, am I going to really split hairs?

And like you said do you really want to do it again in another couple of days? And most people don't want to do it. No.

[00:30:30] **Dr Mike T Nelson:** That's what I tell them. Hey man, we'll retest you in two days if you want. And they're like no, I'm good.

[00:30:36] **James Tognarini:** Yeah, exactly. Exactly. And so, even coming from there, once we get that data afterwards and we're like, okay, cool.

I have that baseline data where, we're going to. And again, like I said it's very rare that the first people, like there's only, I think one person I can think of off the top of my head that came in with a really strong DO2 max and he did his 2k row and I think 623 or 622.

[00:30:56] **Dr Mike T Nelson:** Holy shit.

That's pretty good. That's damn good for, very good. Like people I've tested, obviously these are not elite people, but that's up there.

[00:31:04] **James Tognarini:** It was really, it was very good. By far the best score I've ever gotten from, yeah. And he was like a college athlete too, he had done like a bunch of various, a bunch of various sports and stuff like that.

So, in a case like his, I'm like, okay, cool, like I, you have a very solid aerobic base, clearly above the baseline and because of that, just in and of itself, we're going to start a different point in this kind of training process. And now it's about, okay, if we're going to really test out these heart rate zones and see how we can train properly.

Now we need everyone to buy and get a heart rate strap or something else to use for that too, right? And so, I noticed everyone is jumping on the whoop train, among other things. I don't know your opinion, I know you're very traditional when it comes to the heart rate strap and measuring that, or the Oura ring too, right?

[00:31:47] **Dr Mike T Nelson:** Yeah, it depends on what you're doing. So like the new version of the whoop, what I've seen, I don't know if I still trust it for exercise. I don't have enough data to say yay or nay. The new Apple watch is okay for exercise. The new Garmin is okay for exercise or and man, probably not the best for exercise.

The issue is anytime you run an optical, there are some optical ones that do run off of the forearm and the bicep. And some of those can be pretty pretty good. Joel Jamison's tested a bunch of those and there's some pretty interesting data on those. But the main issue with the optical is you're not looking at the electrical signal, so you're looking at the surrogate as this, basically this pulse goes by.

And if you have tattoos, you have darker skin, like they switch the colors of the lights to try to get around this. What happens is it'll generally miss the top portion unless you're there for a suspended period of time. And it's also very slow to respond. Probably due to the algorithm, what they're doing for averaging and a bunch of other stuff in the background.

So I'm going to have my old, I was a Phoenix five, five, yeah, five. No, a Garmin. Yeah. I have a Phoenix six now, but, and I first got it. I was like, Oh, this is cool. Like I just didn't put my heart rate strap on until I forgot about it. I think I did a two can the rower and it's something max heart rate was like one 41 or something.

I was like, what the hell? I was like, that was, and I looked at my time. My time wasn't that far off.

Yeah.

And I was like, I wasn't starting beta blockers. I don't know what's going on. And so then I put the heart rate strap on and then it was normal. I think max was like 175 something like that. Then again, the new ones aren't as bad, but until I've tested it directly, I don't know how much I trust them.

So for most clients, I still use old school polar electrical heart rate strap, and you can just sync it to the watch. So I sync mine to my watch automatically. So you can set it like on the Garmin at least where once it sees the polar heart rate strap, it'll automatically default to that. It'll take that over the optical, which is good.

You don't really have to fuss around with it too much. Yes. It is a pain in the ass. Yes. You have to wear a heart rate strap, but. At least then I know that the data is accurate because I've made the mistake before where I calculated some

people's zones off of what they said was their true max. And I was like, man, 154, that seems shitty, man.

I don't know what's going on with them, but okay, if that's what it was. And then later I got wise and said, Hey, what watch do you have? How did you get that number? And, one time we put a, send them a polar strap and there's was like 175. So sometimes it's a big difference, especially if you're one of those people that just barely hits max and then it drops off if you're doing like short intervals and things like that.

[00:34:25] **James Tognarini:** Yeah, I've noticed that too. And like the loop, the reason why I think it's getting very popular, well, number one, it, A lot of, they're seeing it in a lot of places, but I use it for a little bit cause I was very curious testing it out since everyone was on board with it. And they have like us, they have a setting for jujitsu which again, like I'm not a big fan of proprietary algorithms when it comes to stuff like that.

Cause I'm always wondering, like, Where are you because obviously, you're gonna create an algorithm that's gonna make me feel really good Like you're trying to get me to buy into this thing, too You know Sure So there's it's like with cardio machines, right? Like different brands of cardio machines when they have their heart rate sensor on there They're telling you how many calories you're burning like there's a bit of an an incentive for them there but the thing is that as I used the this was actually Dean that sent me the video on this Oh, yeah For a little while there was a comparison video that someone was doing where they had the polar heart rate strap And then they had put the loop on various, points because you're able to like strap into various points your body and the bicep where the wrist was maybe compared to the polar strap was in like the Mid to high 60s in terms of accuracy.

The bicep was at like 96 97 which I thought was really cool too. And the other thing is, trying to get people to, cause you can't, you're not gonna wear a watch while you grapple. You can't do that while you spar. The wrist for the whoop is a little bit, even that's going to be a little bit tough when you're grip fighting or trying to choke somebody.

The heart rate strap is something that I know a lot of guys wear though. There's a, there's an, Sort of a situation where it tends to disconnect depending on, what your body position is. If you're very like concave there, it'll tend to disconnect. The bicep strap has been pretty good actually.

Nice. So that's something that's a cool way for everyone to see where they're at in terms of the rounds and see what that average heart rate is at. But then you still run into weird things. Cause then I had someone who just got it and they sent me to Oh, Hey what do you think of my data?

And for some reason they had spent 15 minutes. Oh, okay, cool. Yeah, it's been 15 minutes in zone five which exactly where I was like I don't think so. Yeah that's very for a 60 minute training session. I was like, no, no way. That's that's an insane amount of time to spend there.

And I know that they're, even if they're under, they're not conditioned and the heart rate is spiking up and whatever, like it still doesn't make any sense. So that's where it gets a little bit fishy.

[00:36:35] **Dr Mike T Nelson:** Yeah. Another trick. I don't have my polaroid strap here. Okay. But for even lifting I don't know why it took me forever to figure this out.

Take the puller strap and then slide it under like the left side, like underneath your pectoralis, because it's less likely to get bumped. And especially if you're bench pressing or bringing the bar down, you're not going to crush the little thing all the time. And if you're grappling, it's yeah, you can still get it.

It's not perfect, but it's less likely to. Get in the way at that point,

[00:37:01] **James Tognarini:** That makes a lot of sense because it really is that it's like Where the sternum is as soon as you start to like bridge and frame, they'll disconnect, but that's really interesting I have to try that one out.

[00:37:09] **Dr Mike T Nelson:** Yeah, that actually helps quite a bit So whenever i'm lifting or even rowing i'll move it over to the left side that because I used to ping it when I was rowing and I get pissed off and it was just annoying and i'm like Hey, oh wait.

Oh just slide it over

[00:37:23] **James Tognarini:** And being in like a long row and you're just getting obsessed with it set already during it for something else. You just experience awful.

[00:37:29] **Dr Mike T Nelson:** Yeah. And it's usually like right about almost that point where I bring the handle back to you. So it was annoying me.

[00:37:34] **James Tognarini:** That's yeah.

That's, but you know what? At least you found it, found a method. I'm going to have to try to use that because that's the thing too, right? We try and let's say we track heart rate, consistently in both, your lifting and then we do our kind of direct cardio work. And then in rounds.

You know In terms of what you're my god, this thing is really responsive to me today. If I do this does it

[00:37:52] **Dr Mike T Nelson:** give me

[00:37:54] **James Tognarini:** I don't know man. I think I just have a way with machines here you know what when you see that transition into jiu jitsu and like your sparring sessions, If you were if you're working someone you're really trying to build up that aerobic base Are you just simply looking for them to have a lower average heart rate or a lower max heart rate?

for the same like subjective Difficulty or the same, you know that they're working at

[00:38:14] **Dr Mike T Nelson:** yeah In jiu jitsu, you probably won't be able to do it because there's just too much variability but what I have done with people is you know, like I may do a sub max six minute test Like so I do that a lot with people rate your rpe.

Give me your heart rate profile your average heart rate and give me your watts so I just was emailing this to a guy who was at our talk in the Netherlands about this too. Over time, if your 6 minutes is fixed, right, so time is fixed, if you're going farther, hey that's better. If your heart rate for the same distance, because time is fixed, is lower, hey, that's also better.

Or if your RPE felt better, then that's obviously better too. And it's. Simple, but it's funny how many people don't track those basic things. And that could all be done sub max, right? So that is like progressive six minute thing where you just get out in the morning and do six minutes and your heart rate should go up in about, three minutes into it.

You should be at your quote unquote, almost your max heart rate for that. You should actually hit your max heart rate for that in the last 30 seconds. That's not a true max. It's maybe 10 beats off your true altar of max. But that works really well. It's enough to get one of those sort of intervals in for VO2 max.

You don't have to warm up unless you've got some really serious movement issues. And then if you do that five to six days a week, let's say you do 1, 500 meters, which is relatively easy to do, like that's a pretty good distance, right? And if you said, hey, I could add, five or six high quality six minute intervals to your training aerobically per week, That's pretty cool.

I'd take that. And it literally is about six minutes per day. So for people who are really time crunched or want to work on, some cardiac development, some aerobics and VO two max, I'm like, get a bike, get a rower, put it in your house and just do that. I don't have as much luck with train people on the bike because it just takes a lot longer to get into a higher heart rate.

But unless you're like an elite level rower I don't know, it seems to work pretty damn good.

[00:40:19] **James Tognarini:** Yeah, this is actually I read this one, right? Didn't you? You wrote about it. Yeah, I did in the newsletter recently, yeah. Is that the P6AA one? Yeah. So what made you, like, how did you come to that sort of six minute standard fixed interval?

Is it something that came from research or just like some anecdotal stuff with clients?

[00:40:34] **Dr Mike T Nelson:** Kind of both. Like in, so when COVID happened, I was like, Oh, well, I guess I might as well work on my aerobic base now. I'm not teaching. I'm not going anywhere. I've got all this shit in my garage. I got a freaking metabolic cart, Moxie set up, Nox set up.

I have all this stuff to do it. And I was also testing a bunch of cold water immersion and stuff then too for the FizzFlex course. And I was like, okay, so I did that for almost a year. It definitely helped. Definitely got leaner. Everything went up. But then I realized I'm like, oh man shit, what do I do now?

I don't have an extra 40 minutes to do cardio and cold water and all that stuff every morning like I did before on top of lifting. Well, how do I try to keep some of this? But you can do aerobic days. So I do aerobic days, Tuesday, Thursday, Sunday or Saturday. And that definitely helped. But what I found was, I'm like, what if I just get up and do something every morning?

And I remember visiting my buddy Jim Snyder in Wisconsin. I think it was his wife who was saying that she just gets on the rower in the morning as a way to wake up. I was like, ah, that sounds like a horrible way to wake up in the

morning. But well, what the hell? So I tried it and I'm like, Oh, it does wake you up.

Does this helpful for cognitive stuff? And then I just started playing around with times and intensities. And I was just trying to find what is that kind of that happy medium where I don't really need a lot of warmup. Like I can't really go super hard. Cause then I'll be fried by day four. And I knew the research was two to eight ish minutes at a hundred percent of your VO two max.

But even hitting eight minutes doing a pretty hard 2k every day was still, I tried that. I made about two and a half weeks and I wanted to jump off a cliff. It was pretty horrible. So it basically was just that kind of sweet spot of six minutes gives you enough of that time. You don't really need to warm up, so your heart rate is going to go up progressively over time.

And the key I found too was not that last part of not trying to hit an all out max at the end. The last 30 seconds, it should be pretty hard, you should be out of breath, but if you look at actual heart rate profile, most people are still going to be about 10 beats off of their true max. And I found that just that drop in intensity was enough that made a pretty big difference.

It's if you've ever done a true all out 2K out, a 10 out of a 10 , I, I probably need two to four days to recover from that. Yeah. Like an RP of a nine and a half. I could probably be functional tomorrow. It's not gonna be the greatest, but it's gonna be okay. RP of a nine.

Yeah. Tomorrow I'm pretty good. I'm worthless for the next 20 to 30 minutes. Like I, I just think there's like this huge difference in recovery time from just a nine to a nine and a half to a true all out 10. And I found with that, like at the end of it, your RP is maybe an eight and a half, somewhere in there.

So it's intense, but it's, you're staying below that sort of threshold where, I don't know, there's something about recovery potential just gets to be this, you're on this exponential part of the curve for some reason.

[00:43:31] **James Tognarini:** That's very cool. So so the goal of it too, right? You're basically going up through these heart rate zones during the six minutes, right?

So you're drifting up between there. So, even as you come up into those higher zones, it's still able to work on that, on the entirety of the kind of, you're still

developing cardiovascular system, just as good as if you were staying, let's say one zone for a longer period of time.

[00:43:53] **Dr Mike T Nelson:** I think so, because you get enough high intensity work that it transfers.

Let's see, I did one yesterday, the other day, let me see if I can pull it up on my, I don't know if it'll show up on the camera here, but let's try and experiment. So, okay, logbook, what did I do? Yeah, so here's one. So I did six minutes, I did a distance of 1, 534 meters, average space 157.

And a heart rate zone 5 was 1 minute, zone 4, 2 minutes, 22 seconds, zone 3, 1 minute, and 18 seconds, and the rest was zone 2 and zone 1. So generally if you, I don't know if you can see this, but, maybe not. But if you look at the heart rate, you'll see this kind of nice gradual profile, and then you'll notice that probably about a third ish of the way, like you're already going to be in like zone 3 and above.

[00:44:51] **James Tognarini:** Yeah, because it just seemed like from the numbers there, you were in zone three for the shortest amount of time. So I wonder, is that just is that just a conditioning thing in terms of how quickly your heart rate from that point jumps up into the next zone? Is that something you want to widen in terms of spending more time in zone three?

Or is that just a sort of a natural progression that's going to happen?

[00:45:10] **Dr Mike T Nelson:** Yeah, so what I do is I do it by RPE. So I allow my distance to vary. Okay. And what I'll notice on days that are good, and I'm a little bit more aerobically developed, I'll probably hit like 15, 1550 to 1575 meters, and I'm probably doing pretty good.

If I'm hitting 1545 and around there, I'm probably okay. And so what I notice is I try not to push the intensity of heart rate anymore, but over time I want to try to see if I can get a little bit more length. And if I'm really feeling horrible, I'll sacrifice length for RPE. Meaning I don't want to redline my heart rate to try to make a distance.

Because I tried that. I tried to I wanted to fix the distance and fix the time because it's a hell of a lot easier to tell people what the fuck to do then. Yeah. And what I found was There was just too much variability day to day, like some days I would hit, 1415 if I'm really out of shape like my minimum my floor unless I'm sick is I'm sorry 1514 So my minimum is 1500 if I'm started hitting

below that something's really off So I tell people over time like find what are your absolute floor is and find you know where those good days are And then just use an RPE of it should be around an eight, eight and a half by the end.

And what you'll notice is it'll fluctuate over the course of the week. And then you'll notice it'll slowly, if you look at the averages, be going up from about every two weeks or so, you should see a little bit of an uptick.

[00:46:45] **James Tognarini:** That's really cool. I wonder if there's a difference, if you were trying to be specific about An rpe staying at a constant or trying to develop the various zones Do you think it would work if you did that same sort of protocol?

But as opposed to doing it in one in like continuity you hit it in intervals Do you think that would make a difference?

[00:47:04] **Dr Mike T Nelson:** Yes, so if I have an actual Metabolic heart test on someone you'll see right away what zones they don't train in, right? Because you'll see all their efficiencies everything just goes to shit.

They don't stay there very long You That does kind of change, with testing and then testing day to day isn't always the same, but if you look at enough data, you'll be able to tell right away, like where, what kind of gear they're missing. And so in those cases, like you said, wow, you're really missing zone three and you don't do a lot of cardiac development stuff.

Then I'm literally going to have them do repeated work in zone three. So from metabolic heart, I can give them a heart rate to, to work in that area. And then once they start drifting either above it, then I'm going to chop that for time and they're going to rest completely. And then they're going to go again.

So if they're trying to stay in zone three at a certain rate, if they really have to drop their power output, then I'm like, okay, you just need to stop right now, rest completely. And let's do an interval again, because I want, Higher quality work, and then I want it be able to repeat that work because I want to stay within that particular area, and I don't want to completely sacrifice power to do it right because at the end of the day, they have some performance goal.

They're trying to hit. It's not just arbitrary heart rate. And that's what one of my pet peeves is. They're like, well, but I was able to stay in that heart rate for 40 minutes. I'm like, yeah, but your output did this and then. Went off a cliff for the last 10 minutes. No, but my heart rate was, it was good.

I'm like, but you were so inefficient and so fatigued for those last 10 minutes. Like you just, you probably got worse by doing that. So let's just chop that off. Let's give you some rest and let's have you go again at that thing again. And that can be applied to. High intensity intervals, low intensity, it just depends on what you're trying to work on.

[00:48:56] **James Tognarini:** Yeah. I, so that's exactly it. That's why I'm asking about it is cause I'm always, I've always been a little bit of partial towards the intervals because it gives me in my mind, like a really good way to keep a pretty Good average intensity for a longer duration and not having to worry as much about that heart rate drift But one thing that you said that was really interesting is that you give them a complete rest Is that like a standard that you normally do if you're doing any intervals?

Are you always giving a complete rest after a certain period of time or when they drop out of that zone

[00:49:26] **Dr Mike T Nelson:** when I? When I start with anyone that pretty much everything is complete rest Because they usually are lacking the ability to do any quality repeats. Now again, like you had your vo2 monster friend who's a 623 Like they you can probably do incomplete rest with him or her.

I don't know who it was and they're probably going to be fine right but most people They've done too much work where they allow Rpe to escalate and output to absolutely tank and that's their marker for how hard the training session was It's well, okay. Yeah, there's time. You definitely need to train hard like doing a full out 2k.

This is not a fun But at some point if heart rate is escalating up too high and your output is just dropping like you're not getting better You're just building up a massive amount of fatigue So one of things I call it is a QDR quality density repeat. So keep the quality first Try to cram the density over time, but then you're going to repeat that thing that you're doing whether so for example, if it's 30 second intervals, you can look to see from interval one interval 10, like how much power output did you lose?

Like some people will lose when I have them actually do this, they'll only make it to five intervals. If I say the rest rate is 30 seconds, so a one to one, which is very difficult. They might lose 40 percent of their output between interval 1 and interval 5. To me that's like unacceptable. You're just not, your aerobic system isn't just trained well enough to do that. You're losing too much quality. So, yeah, we might do some of that, but you're probably going to rest completely

until your heart rate comes all the way back down, probably below 85. Okay, now go again. Because I don't care how long you rest.

I want your body to see that just like lifting I want your body to see that stimulus of doing that output because that's what's going to drive the adaptation And once we get that then we can start worrying about compressing time over weeks months So if you can hit 30, 30, I got this from Ken and Jay, you can get like 30 seconds on 30 seconds off, and you can do that for 10 rounds.

And you don't see, in my world, I would say at least I allow a 10 percent drop off, but even if you've got 20 percent drop off, like that's pretty good, like 30, 30 with a 10 percent drop off, like that's bad ass. Like to me that's pretty far out on the right end of the spectrum.

Assuming you have somewhat of a respectable power output, you're not doing like 75 Watts or something. Yeah.

[00:51:58] **James Tognarini:** Yeah. Yeah. That do you think that one of the reasons why people go right away for like ratioed work rest as opposed to full rest is because they like they bridge the two with like cardiovascular training interval training with energy system work.

And they're always just assuming that Oh, the energy system takes a one to three typically to recover. And so they match that. Do you think that's why most people go that way?

[00:52:18] **Dr Mike T Nelson:** I just think too many people are lazy when they write conditioning and they just do one to one for everything. And that's all they hear.

[00:52:27] **James Tognarini:** You're like, the answer is way simpler than that. It's just, it just seems to be like a habit. It's just

[00:52:31] **Dr Mike T Nelson:** way easier to write 30, 30, 60, 60.

[00:52:35] **James Tognarini:** Cause I was doing, I was working with Pat Davidson for a little bit and he was having me do like his, one of the ones he always had me do in every phase was 1545 on the assault bike.

[00:52:45] **Dr Mike T Nelson:** Okay. 15 on 45 rest.

[00:52:47] **James Tognarini:** Exactly.

[00:52:47] **Dr Mike T Nelson:** Yeah.

[00:52:48] **James Tognarini:** But it was basically, it wasn't like an all out at all. It was just, he was saying, we were paying attention to the wattage but it was like a subjective RP of, seven, like 70 percent intensity. You think easy power, do your thing.

And then we would bring up that volume week to week. So let's say, we would do four repeats rest and then a full rest and then, three, three, and then we'd eventually build it up so that it was kind four repeats for four sets and we would keep going on so I was doing 16 rounds of it Let's say over over the time and it was cool to see like even though I was trying to subjectively keep it at seven on ten to see Phase to phase that average wattage go up Which was nice because we had one fixed variable, which was, time to your point, like you do with the six minutes.

And then we were able to see that, but that sort of hit a, definitely hit a point of diminishing returns because you're lifting at the same time too, right after that. So, there was definitely a point where I started to see that, that average wattage drop down. And that's what it made me think okay, well now, is there something else that I should be working on?

Is it more of a recovery thing now where I'm just not, I don't know, recovering well enough within that 45 seconds anymore because of other fatigue or any other factors to be able to still hit that same amount of wattage. And then at what point do I stop, which I guess you said it already, like a 10 to 20 percent drop off is what you're looking for.

[00:53:56] **Dr Mike T Nelson:** Yeah, it also depends on how often you train and what you're looking at, right? So if you're training more frequently and the output, you really need to hit a certain output, then your drop off could be single digits, right? Yeah. If you're just training for general conditioning, then yeah, you've got probably a fair amount more wiggle room.

But the issue I found too, is that, I like that method. I think it's great. Definitely works. The hard part is once you start overlapping energy systems with lifting, I find that the lactate type stuff will just fry people really fast. So you have to. Not be careful with it, but just be mindful,

[00:54:38] **James Tognarini:** so if it's the, and then in that case, if it's the lactate, that's going to hold them back, if you're training for a sport that does

build up a lot of lactate, do you think that there's any benefit whatsoever in doing weightlifting, circuit training or intervals at all?

[00:54:55] **Dr Mike T Nelson:** Depends on the sport.

So depending on who you talk to, like I'm good friends with Cal Dietz and he would For a lot of his NHL people would be the NHL is better now than it was, but five years ago, if I put words in his mouth, he would say my interpretation of his words would be his top level NHL guys. He would not do a lot of lactate stuff.

He would develop their aerobic system, make sure their weight training is good because he knew they would hammer the lactate system before the season. They didn't really have to worry about it, but he wanted the aerobic system to be developed, to be able to handle that kind of stress. Now, there's also another paradox where some lactate testing, another buddy of mine did in the NHL.

A lot of the high level players were hardly ever in lactate at all. College and high school definitely were. And that kind of makes sense, right? Because if you're in NHL, what is like the average shift now? Probably only 20 to 30 seconds. I'm sure there's exceptions to that. And you're that well trained like you probably are never really in a lactate zone Even though you're playing a lactate glycolytic type sport so I think it depends on the sport Like if you go to sports like crossfit and we're doing metcons to death like yeah, you're just You're gonna have a lot of lactate rowing, things like that.

So some sports you just can't get around it cycling, etc but i'd say it's variable and then metcons are just their own animal like everybody wants to metcon themselves to death and You There's definitely a time and a place for it. And if you're competing in CrossFit or you're maybe doing some jujitsu or doing other things yeah, there's definitely a place for it.

I'm not I'm not against it, but whenever you say aerobic training, people are like, Oh, can I do this? Whatever CrossFit Hellainish, Metcon from hell thing. Like you can do it, but understand that's just basically highly glycolytic for you. It's probably a lot of lactate. It's going to be a lot of stress that, in my opinion, you're not going to get a huge benefit from.

Now, again, if you're training for CrossFit, then that's different. It's now sports specific. If you're doing it for, a short finisher of two to five to maybe ten minutes, Fine. Probably not going to be a huge deal. If you're going to go try to

blast yourself for another, 40 minutes, three times a week doing Metcons, then I've usually never seen that work.

[00:57:10] **James Tognarini:** That's yeah. I agree with you a hundred percent. Cause like I always try to, I'm trying to, build a framework around this so I can create some consistency and see what works and what doesn't work for various people. And so I categorized this sort of training and like when we're thinking about building up.

If we're talking about energy systems, like system, if we're talking about, like aerobics and stuff like that, like your direct work, which is going to be just purely that I'm trying to get to these heart rate zones, I'm going to use a bike, I'm going to use a roller, I'm going to use very direct methods to get this where nothing else is really getting in the way the indirect work, which would be trying to still get into the zone, but with some muscular demand as well, doing some sort of weightlifting circuit.

Nothing that kills you too much because we still have to worry about recovery too but the only connection I made with that is just because again the like grappling is just so Muscularly like it's so intensely heavy on the muscles as well because you're not just we're not just looking at how Well, you can keep your heart rate under you know In the same zone and try to go for as long as possible, but you physically have to force and fight and lift and drop and do all these different things and squeeze isometrically.

So, that indirect, that's why I use that as an indirect training method for it. And then the sports specific, which is just like we spoke about at the beginning, like you're trying to get X number of rounds in, there's also that concept to where if you want to get better at six minute rounds, like do six minute rounds, So it's like trying to find this middle ground of like where each of these things apply.

I don't know if that categorization makes sense to you. We're just trying to find something around there.

[00:58:29] **Dr Mike T Nelson:** Yeah, I would agree and if you get into like higher level stuff, which I think MMA has generally fixed this for a while, but For a while, you would see whenever people went to the ground, like some people's conditioning would just go to absolute shit,

you

know, and you like, talk to him, you're like, Oh yeah, we just did lots of running and we don't, I'm like, okay.

At some point, like your aerobic system is not your rate limiter, right? So you got a little bit of a different case than a lot of other people. You're pretty strong. Your skill level's high. But the thing, like you said, you missed was the position specific conditioning. And so normally you'll figure that out by watching actual, tournaments, competitions, et cetera.

There was some of those people, it's okay, sit on your ass and do a bunch of kettlebell presses and a bunch of other weird shit. And, stuff where you're not standing or running, like you're purposely trying to get this transfer into your sport and to be more sports specific at that point.

Again, I would say that usually only happens from what I've seen at a higher level Most people is just their aerobic system is so trash like they don't worry about any of that stuff Really like you can do it. There might be a transfer There might be a benefit to it but if your vo2 max is 21 like bro, like you need a bigger vo2 max before you worry about Set specific like sitting on your butt doing you know specific things

[00:59:44] **James Tognarini:** Yeah I think so too.

And I think it also depends on how much time you're dedicating to, training outside of your, you, if you can afford to have five days of training or four days of uplifting or something like that, then we can afford to split some volume up. We don't have to do things as much, or you even have the benefit of one of those days, maybe being something that's more in that uncomfortable indirect realm, but it ends up being 20 percent of your training.

So, it offsets really well. So yeah, I, I think that there's always trying to find this way to make things. Make things useful to see a benefit from it, but also be able to like, progress it too because even From the six minute because I remember reading that email and thinking oh this sounds really cool Also awful if you take if you go too far with it.

Oh, yeah I've

[01:00:25] **Dr Mike T Nelson:** torched myself on that.

[01:00:26] **James Tognarini:** Yeah Because there was another one that you had put up. I think it was Close to that too. It was the norwegian four by four.

[01:00:34] **Dr Mike T Nelson:** Yeah,

[01:00:35] **James Tognarini:** And that too I but that one I looked at and I was like this seems dangerous right off the bat

[01:00:40] **Dr Mike T Nelson:** Yeah, everyone goes that's like the popular one now.

Yeah, I don't know why Again, there's some pretty good data on it, but my pet peeve is, and I like a lot of the people who say this message, it's not an insult towards them. It's okay. We looked at this research pool. We saw these benefits and VO two max rate. I'm a researcher. I've never trained a single person in my entire history.

I'm going to go proclaim everyone has to do four by four. And if you watch their output on someone who is not very aerobically developed, I'm going If they have the gonadal fortitude to make it through that, which is horrible, it's like they're at maybe 50 percent of, interval four compared to interval one.

So it's let's just start with the interval one. Can you give me four minutes of a high quality output? Cool. If you can't, let's drop it to two minutes. There's nothing magical about four minutes. That's just what the researchers used for their protocol. And they wanted it to be mostly complete rest for their subjects.

So they had four minutes, which is Very fair, but in an effort to keep it easy, they left the rest intervals the same all the time. And that's my other pet peeve is, do you really need if you're lifting do you really need that much rest between set one and two? If you're horribly aerobically developed, then maybe.

But you're going to need a lot more rest between set three and four and five. Like you, fatigue accumulates and it's, yeah. So that's my other pet peeve of, we tend to default into these nice rest periods where. Most people like from round one to two, like they don't need four minutes, like rest, whatever you need.

And then we'll just keep track of the total time to complete the total work that gives us our density score. And then if you're not sure, and you haven't done this before, like I have some pretty horrible intervals I stole from Dr. Kenneth J. And I can tell you what they are in just a sec, but rest a little longer, it's okay.

And over time, then you'll compress it because the quality of the work is the number one thing I'd rather have, new clients like just rest a little bit too long.

And then next thing, okay, great. That was probably too long. Well, we'll just compress it a little bit. Like you're fine. Like you're good to go.

[01:02:47] **James Tognarini:** Yeah. And so, and that's, that just feeds back right into what you were talking about with complete rest. If you feel completely rested from interval one to two in one minute, great. Take your one minute. But if by interval three or four, it takes you double that amount of time, well, that's what it takes you.

But the goal is to keep that quality. And then, like you said, as soon as that quality drops off, Then that workout is essentially done. And so the progression I imagine from there is just Hey, can we get one more interval next time?

[01:03:11] **Dr Mike T Nelson:** Yeah. It's the same as weightlifting. It's like volume, density, intensity.

Intensity is how hard did you go on the interval? What is your output for whatever time you're doing? Density is just how many intervals did you do or how much work did you do over the course of time? And then volume. It's I'm a big fan of adding volume. Like I'll. Like I've taken like the four by four method.

I've had people go out to five or six rounds. Sometimes I don't recommend it. Like it's not fun, but if people have the time and they are, looking pretty good at the end of round four and they're feeling pretty good, I may add more volume first before I try to compress the density, because if I were to guess.

My guess is volume would be a more, I don't know if more better is a word, but a more direct stimulus for their physiology, right? Because you just did more high quality work. That's the name of the game.

[01:04:06] **James Tognarini:** I think, yeah, absolutely. I think that, measures of, there's very few, from what I've seen, I think there's very few things that you're looking purely for an increase in intensity to measure and get better.

Because again, you can only do, you can only do high intense work. It's going to be very hard for you to increase intensity. Your volume on super, super high intense work, but if you get to that middle ground and you're able to increase the volume in a really moderate and even like moderate high zone, I think it'll do more for that top end than just trying to go as hard as you can and then not being able to recover from it.

[01:04:37] **Dr Mike T Nelson:** Yeah. And there's also nothing magical about that. You have to progress week to week. Like I had one guy Brian was a natural bodybuilder in Colorado. He came to me and said he wanted to work on his aerobic base, and he was actually pretty good to start. And I think he, we started him, his 2k was, I want to say it was 7.

15 or 7. 17. And he wanted to hit 7. 02, which he did in 6 weeks. Which is pretty crazy, to take almost 15 seconds off. And this isn't going from 9 minutes to, 8. 45, it's, once you're below 8, you're in the 7s it's a fair amount of work to get it to move. We had him do a lot of heinous shit And a lot of cardiac development stuff and a lot of intervals and he did fine.

We crushed it He was awesome. And then at the end of this we tested him on week seven, I think and I asked him I said Hey, what else do you want to do? He's like None of that. I'm going to go ride my bike for fun for a while. And when I get motivated again, I'll let you know.

It's brutal.

[01:05:44] **James Tognarini:** Yeah. Yeah, absolutely. That makes sense. And it works and it's like with most things, it's like, how long can you sustain it for?

[01:05:51] **Dr Mike T Nelson:** And I knew we only had a few weeks. Like you said, I want to do this. I've got about eight weeks. I'm like, great. Are you okay?

Going hard. He's yeah, man. I'm like, whatever you want. I'm like. Perfect. And again, he could handle it. Like his outputs were staying where they needed to be.

[01:06:05] **James Tognarini:** Yeah. You actually just reminded me now that you're talking about some intervals there. Another one from I think it was from a presentation in Costa Rica though.

It could have been another one that I was watching of you. But you spoke about another method that you really enjoyed. I don't know if you still do. It was your favorite one at the time. I believe you said it was like the adaptation of the 10, 20, 30, 20, 30 interval from who was it?

[01:06:24] **Dr Mike T Nelson:** Oh, from Kenneth J, the Majoran intervals.

Yes, Thor's hammer is. Yeah, this

[01:06:28] **James Tognarini:** is exactly that one.

[01:06:29] **Dr Mike T Nelson:** Yeah. Those are the horrible intervals I was talking about. That was okay. It was that

[01:06:33] **James Tognarini:** one.

[01:06:33] **Dr Mike T Nelson:** Yeah. I saw this from Kenneth J and if I had to pick one thing that'll increase someone's had everything from 500 meters on a rower to a 20 meter, I'm sorry, a 20 minute, this is probably the intervals that I'll go with.

And so what it is. You start off, you do your warmups and then round one is 100 meters at 170 percent of your VO2 max. So what you do is you take your 2k, you figure out your watts for your 2k, that's your 2k, that's 100 percent of your VO2 max. So you take your 2k watts and you do 170 percent of that.

So if you look at Tabata stuff is 170 percent of what their VO2 max was. But you're only doing that for 100 meters. But then you rest 30 seconds. Round two, now you go 200 meters, but you're doing 150 percent of your 2k output. Rest 30 seconds. Now you're going to do 300 meters at your 2k output.

Rest 30 seconds. 400 meters at, I think it's 85 percent of your 2k. And then 500 meters after the 30 seconds rest. So 500 meters at, I think it's 75%. And so what you find is, It's a cool way because you're prioritizing the very high power stuff at the beginning when you're a little bit more fresh but you've got this accumulating fatigue and what you find is if people Are missing the high power end like it'll be hard for them to hit an average of 170 Because they're only going 100 meters, right?

So you gotta like you gotta hammer it pretty hard to start And then you would think that wow 500 meters at 75 But when you add that fatigue on it, if your aerobic system isn't as well developed, like the 500 meters is quite challenging. And then you do a complete rest, three, five, maybe even up to six minutes.

And then I just, usually I'll add one new round of that per week, not always in linear. And if you can do five rounds of that, and you can keep your output pretty damn close from round one to five, it's pretty badass.

[01:08:40] **James Tognarini:** That's heavy and it's fucking

[01:08:42] **Dr Mike T Nelson:** horrible

[01:08:44] **James Tognarini:** It sounds awful And that's what made me think about it because when we were just talking about the intervals right now And you're talking about this guy who you did that adapted four by four and you progress it He just hated it.

I was like fuck. I'm, pretty sure there was one that you also there was it's all trauma based cardio stuff, so i'm just trying to link it together that does sound horrible. And so where do you think you fit that on the spectrum of if I was to do, that six minute daily and build up that aerobic base we, I had asked the question before about, maybe splitting that up into intervals.

If we had to, this is a definitely an interval based system that, that can't be something you do with, very frequently in the week. I wouldn't think.

[01:09:18] **Dr Mike T Nelson:** No, like it's only about, I've played around with all sorts of variables. If I'm at home, if I'm sleeping and I'm eating a shit ton of calories and everything else is good.

I might be able to get away with it twice a week, but I have to sub out lifting instead. Meaning that this would sub in for a lifting day and that's pushing it. I doesn't work very well. So with almost 90 percent of people, it'll be once per week. And normally it would replace one of their lifting sessions.

So if you find like on their program and you're like, okay, this is a pretty good program. We're going to recovery and everything is going along pretty good. Yeah. And let's say Thursday is, whatever, full body lifting day, they're lifting four days a week. I would somehow rejigger the lifting into three days.

And then this would go in as a lifting day. Cause it definitely is more intense. And usually you can replace, you don't really have to do any other interval work, like you don't have to do any VO two max intervals or anything like that. And then I also usually use it more on the psychology side. Cause some people.

Like lifters love it and hate it because it's a weird thing where you really don't have to focus for a short period of time. And then you get that 30 seconds of rest. Like some people like having them do, six minutes of their video to max. Like they absolutely you like hate it. Like they can't stand it at all, but you can trick them into doing it with this program.

And I think if I did my math right, when I did it once, if you do all five rounds, I want to say the rowing distance on that is 7, 500 meters. I think. I'd have to double check that to make sure, because it would be at 100, so then 200 would

be 300, 600, so you'd be at almost, what, 1100? I gotta, now I gotta add it up because now it's pissing me off.

Hold on

[01:11:07] **James Tognarini:** one sec. So

[01:11:09] **Dr Mike T Nelson:** 100 plus 200 plus 300. Plus 400 plus 500. Yeah. 1, 500 per round times five. Yeah. 7, 500 meters.

[01:11:20] **James Tognarini:** Okay. So the minute, so the protocol is for five rounds that a standard, or at least, I guess you, you modify it based off of like the drop off, but that the standard protocols, five minute five rounds, excuse me.

[01:11:30] **Dr Mike T Nelson:** You would work up to five rounds. Okay. Yeah.

[01:11:33] **James Tognarini:** Yeah.

[01:11:33] **Dr Mike T Nelson:** And usually what you find is like week one, like first round, you're like, that wasn't too bad. That's pretty cool. I got this. Like next week, two rounds. You're like. First round easy second round. Yeah, you know that was hard, but this is not bad I don't know why he's bitching about all this stuff like three rounds like the first one Yeah, okay second kind of suck the third one.

You're like oh boy. Okay, I can see why This is difficult now and this is like taking five to six minutes between

yeah,

you get to round four you're like Oh, shit. I do not want to do this. This is really sucking ass. Really bad. And then round five is just, is. It's just horrible, but you get feedback because if you can't hold those outputs, I don't progress people

[01:12:18] **James Tognarini:** That's what I was it's exactly what I was gonna ask would you even cut it in the middle of the of one of the rounds or do you still let them finish the?

Round

[01:12:26] **Dr Mike T Nelson:** I tell them to finish more because of the psychology because If you start thinking you can quit at any time, that's not so good. And I have this thing on a 2k or even on the rower where if I go to, if I'm not sure what I'm going to do, cool, I'll just hit just row. That's fine. If I'm still not sure, but I want a time domain to work in, I can program a time.

But if I program a distance, then I have to finish the distance, unless I am 100 percent convinced I'm going to have some catastrophic injury and blow a disc in my back or blow my knee out or whatever. Yeah. Because I found it's too easy when you're doing a 2k and let's say an RP of a nine, it's a test day, you're halfway through and you're not going to get a PR.

There's this. No way possible. It's so easy at that point to just be like, ah, fuck it. I'm done. And then you start getting that stuck in your head of. I don't know. Today's not very good. I can just quit at any point, really. It sucks. Or I like that I have to decide going into it.

Now, I can choose to do 8 minutes or 7 minutes or 6 minutes. I don't have that restriction. But for me, I found mentally if I program a distance, then my brain doesn't have the hour of stopping early. I have to suffer through it, so I might as well just do what I can. And I found that Is actually helpful because otherwise doing it the whole time thinking you can stop at any point is not the best.

[01:13:58] **James Tognarini:** Yeah, that does make it tough. I, you know what, from personal experience, I remember one of the times that I did. Ma the mass work out there that oh, yeah. And I say one of the times because I don't know why I did it, so like multiple times it was, oh God, boo. Yeah, it was awful. But the one thing I did notice was the amount of effort, like the pain that I was in, just even from a cardiovascular standpoint, the lifting standpoint, everything.

I remember training afterwards on the mats, I was doing jiujitsu and I had a really tough round with one of my coaches at the time. And he was like it was very tough and I was Literally fighting for my life at that point. But all I remember feeling was that like, holy crap This feels eerily similar like the breathing the brain that i'm getting.

Oh, yeah similar to like midway through that mass workout and i'm like Fuck if I finish that I can for sure finish this round. I can still keep pushing a little bit more I don't have to you know concede positions like I can just go and I didn't win the round but I definitely didn't quit in the round just because You of that same feeling, right?

That, that psychology of Hey, I've had to finish that, so I'm going to have to finish this. And I think that there's a lot to be said about putting competitive athletes in a headspace where they don't really have the choice but to finish it. I don't need you to set a, break a record doing it, but I do need you to finish this.

And you have to understand that at the end of the day that's when you're done. You're only done when the protocol is complete.

[01:15:17] **Dr Mike T Nelson:** Yeah. And that's what I really liked. The rower and cold water immersion for that because on the rower, it's, if you're doing some high intensity stuff, it's horrible.

But the pro is there's really no eccentric load. There's not a lot of load on the knees. There's not a lot of load on the joints. Yes, there's a lead level forum and there's bad form, but you can teach someone halfway decent forum in a few minutes, right? It's not like Olympic weightlifting. You're not going to have to take a decade to try to master the form or anything like that.

And you could argue, even if your form sucks more, like you're just not as efficient. So you get more of a training effect on it, right? I agree. Yeah. And then same thing with cold water immersion. Like you can do it almost daily. It's basically just a kind of a mental fortitude test, there we can argue about some of the benefits, maybe there's some benefits, maybe there's not, but it's one of those things where, okay.

Cause I thought like doing cold water stuff, like during COVID, like I figured after doing it almost daily for 10 months, that it would be easy. Yeah. And be like, okay, I'm going to go in and do it. And it definitely did get easier, but every single time, even to this day, like right before you get in, you're like, this is stupid.

What am I doing? This is dumb. Like that little voice of you shouldn't do this. It's hard. Like it just never completely went away. Yeah.

[01:16:38] **James Tognarini:** Speaking about that, though have you is that still, obviously still something that's part of your routine if you're doing it somewhat daily now, depending on tattoos.

But have you noticed any significant benefits? Because I remember it was a pretty big portion of your physiological flexibility presentation, too, when you're talking about heat and you're talking about cold. So, has your opinion changed at all on that over this last few years?

[01:16:59] **Dr Mike T Nelson:** Not really. I would say if I looked at the literature only, It's so across the board, like I just read another study the other day that different types of strength may be enhanced, may not be enhanced.

I would say the performance aspect of it is still up in the air, right? Even for hypertrophy, like everyone's Oh, boo, hypertrophy at once all your gains. And yes, it does turn down, muscle protein, synthetic response, like health folks and other guys have shown that. Pretty conclusively, what that means in terms of actual muscle, nobody knows.

Greg Hoff did a study in Australia, they used both hot water and cold water. They didn't see any change, any detrimental change in their athletes for lean body mass. So at least in that study, we did not see any difference. You could argue maybe it's below the, DEXA detection, all this kind of stuff.

I do think there is probably a benefit for aerobic stuff that's probably modified via PGC 1 alpha. Probably the same thing on the hot response. There's better data on heat for that. So I've been using it, I'd say mostly after aerobic stuff, and I think that it helps. Now again, all that could be masked by the norepinephrine, the dopamine release, which you get from it and you feel better.

But what I have noticed not having done it for, this is probably the longest period of time. I actually haven't done it. I just feel a little bit more off and like all the little kind of weird joint niggly type stuff, if I'm not more cognizant of movement and nutrition, that kind of stuff, it feels like they go more to the surface where it seems like when I'm doing cold water and all that stuff more, my moves a little bit better, my cognition is a little bit better.

And the little niggly joint stuff doesn't seem to be as apparent. Again, that's 100 percent anecdotal. Last part is pretty, I would say, convincing data now showing that it probably doesn't modify inflammation, at least in healthy people, even though you'll see that everywhere on the internet. As again, I just read a new study on that the other day that It showed literally no change in it again pathologies, maybe so, yeah.

[01:19:08] **James Tognarini:** Interesting. Very cool. Do you notice, did you notice any significant change in HRV values when you stopped?

[01:19:15] **Dr Mike T Nelson:** Not really. My HRV didn't really drop that much. No. And I didn't, So the protocol I was using before recently, I went to colder temperatures, but shorter time periods. So I would say if my goal was to

raise HRV, And to try to get back more of what I would say is a standard cold water adaptation.

Again, like I talked about in the course, I go all the way back up to 50 degrees and then I would start going out to 5 to 6 minutes and then I would drop the temperature. When I did that, I did notice a bump over time in heart rate variability, but it wasn't massive. It wasn't huge. And so I switched to a colder temperature for shorter time periods, more for just, The sympathetic output and the kind of the cognitive thing.

I think I have this in the course. Now. I can't remember if actually, I think I did. I put a little protocol in there about. How to alter cold water for what you want to do. So if you want like a cold water adaptation, you probably want to take a slow and steady approach and you want to build up time in a eustress model.

If you want to just get the cognition effect from it, you want as much cold water on your skin because that's a sympathetic response. So you want to go colder in a shorter period of time. If you want a really heavy parasympathetic response, then you're looking at I like a mammalian dive reflex, which is more just only face exposure, things of that nature.

There's ways you can play around with different protocols to try to get different effects.

[01:20:45] **James Tognarini:** Very interesting. And so, but you're just testing it right with the cold exposure, right? You're not doing a heat and then cold, like the thermal circuit type thing.

[01:20:53] **Dr Mike T Nelson:** I haven't done that too much this summer.

I don't have a sauna here, but what I did before for a couple of summers is I put the rower out in the middle of the street. And so I would do that when it was 90 some degrees and humid, get in the cold water. And then, yeah, I tried all sorts of crazy shit with that. And I don't know if any of it was useful, to be honest.

I think there's a useful component to being able to switch at a high end. Cause it definitely does feel more like a stressor. So doing just simple exercise and then getting the cold, it. It feels quite a bit different. I don't know how to explain it. It just yeah, it feels different. I don't know if I'll release this as a protocol.

I don't have enough data yet. But what I did in heat environments, if your goal is performance only, and you're not going for heat adaptation, it's a pain in the ass.

But I did use the cold water immersion as a way to dump your thermal load. So what you would do is if your heat your outside of put the road in the street, and I do something like I was in via two max intervals.

And then I would come in, I would have the freezer at around I think it was at 48 degrees then, so I would go, up to my chin for probably two to three minutes, get off, and then I would go back and do a next round on the rower. So my thought is, and it did work pretty good, is that because of the thermal stress, that impairs your ability to recover.

And it's not like I can go lie in an air conditioned place. I guess I could go inside, but but getting in the cold will actually get rid of a lot of that thermal load. And that allows you to get back to homeostasis better by my little air quotes, you're cheating. And then you can do, you can basically do a better density of training.

Now the hard part with that is that you do mitigate some of the heat adaptation. So if you want heat adaptation, you would not do that protocol. But in my case, I didn't really care so much about heat adaptation. I was just seeing how far could I push density. And by doing that, I definitely could cut down on the rest periods between times. That's very cool.

[01:22:56] **James Tognarini:** But like you said, I mean you're sacrificing some of that You're sacrificing one thing for another right because at the end of the day you're trying to move the needle with you can't do both necessarily super effectively that's cool. But I guess then in that case it would have to be an immediate thing, right?

There's you I guess you lose more and more of that adaptability or at least like the the recovery component from it as time goes on from exercise to the cold exposure.

[01:23:21] **Dr Mike T Nelson:** Yeah, so I just did it during rest periods. So I just said I'd start my clock, okay, here's my first interval, I think it was like at four minutes.

And then I would get in the cold water for two to three minutes, dry off, get back on the rower. And so I tracked it doing that way, how much density could I do without doing the cold water in between, just walking around outside. And I definitely could, by a pretty significant margin, get a little bit better outputs and definitely contract the time period.

The only, and it sounds amazing when you talk about it to people, but freaking pain in the ass because you're all wet and then you got to put all your shoes and your shit back on and I, it sounds dumb, but that part was annoying.

[01:24:03] **James Tognarini:** That's a huge barrier. You know what I mean? It reminds me of, of like I remember watching like back in the day one of those crossfit games workouts where It was like a swim and then it was like pull ups or whatever. Oh, yeah, yeah It's not even the fact that i'm tired. It's that i'm gonna slip off this bar and die. Yeah that's the hard part. That's cool.

That's very cool And so do you so in that case like would you make the conclusion that the cold water? The cold water immersion, given the temperature and what you're trying to go for, not necessarily the cold acclimation, but for the recovery does more for you than like heat exposure in terms of if it's separate from workout, just for recovery,

[01:24:40] **Dr Mike T Nelson:** rephrase that

[01:24:41] **James Tognarini:** again.

I think I almost got what you're

[01:24:42] **Dr Mike T Nelson:** saying.

[01:24:43] **James Tognarini:** So if we're looking at so this, is this working by a mechanism of just, cooling down the body so that you can work again, or is there. a tangible like recovery aspect to Water immersion compared to if it was just heat So if you were to if you were to exercise and then we're looking for just measurements of recovery itself total recovery would we then place cold exposure higher up on that order compared to heat exposure?

[01:25:08] **Dr Mike T Nelson:** Let me know this answers your question I would say overall for recovery heat exposure probably has a lot better documented benefits We know for aerobic training, heat exposure works really well, like PGC 1 alpha, probably, plasma volume expansion, heart rate elevations without really doing work.

If

you get into the molecular stuff, there's some molecular adaptations that happen with sauna that may help aerobic performance, but you don't get them directly from exercise either.

So they appear to be potentially an additive effect. Unfortunately, I can't find any literature that's looked at that. There's a couple of studies and moderately trained people with mixed results, but they were so almost untrained. I'm like, I don't know. We've got a lot of data with simulation stuff showing if you're going to compete in a hot environment, then.

Any type of thermal preconditioning is helpful. So I still put heat probably above cold. And then in the little experiment I was doing. I think the main benefit is just literally dumping the thermal load. I don't know if there's a recovery aspect to the nervous system from cold, but my RP was lower.

So I don't know on that because when you get out of the cold, if you've done exercise, we've been in Costa Rica together where it's before I had air conditioning and it's, if you're not adapted to it, it's fricking miserable. Like I wear shoes all the time in the gym because it's like a floating pool of sweat and A slip and slide in there, like half the time and shit.

But so I've on that, I think it's just dumping the thermal load and you do feel a lot better. Like I did feel like before I did another round, I was like, yeah, this feels good. I'm like, I feel much better ready to go.

[01:26:53] **James Tognarini:** Yeah. I'm always curious. Cause like you said, yeah, to your point, the reason I asked that was cause there's a lot more research and talk around heat exposure different temperatures and time exposure and all the variables that come with and so it always makes me wonder that if the cold exposure is just it diminishes with time It seems like that's what's happening over here Like you see an immediate benefit by dumping that thermal load but is that the only benefit that it has in terms of like short term recovery or Can we see something else long term?

but like you said, I think a lot of the research around cold exposure has to do more with cognitive stuff and some stuff with the inflammation, but like you said It's not really it doesn't really show like it's improving the immune system all that much in the end You

[01:27:29] **Dr Mike T Nelson:** Yeah, and for what it's worth I've talked to other people who've done this too I would go on vacation we'd go down to Costa Rica for, two weeks or whatever, come back.

It literally felt like I did do any cold exposure whatsoever. Taking, it's this weird, almost asymmetric thing where, like, when I was at home, in COVID yeah, everything was good. I'd work myself down, I think, 41 degrees for five

minutes pretty easily. But it took quite a while to step down, and I was in no, no hurry.

And then literally going away for two weeks and coming back, it's Oh my god, I feel like I've never done this at all. There's this weird regression back to baseline or whatever. Where I don't notice that with HEAT. And again, we've got better documentation on HEAT and how long HEAT adaptation stays and all that kind of stuff.

That's something that's just, I don't know what that is. But I've talked to other people who've done it, and they've all reported the same thing.

[01:28:24] **James Tognarini:** That's very cool. So it's it is it just purely a physiology thing or biology thing where we lose that cold adaptation quicker as a mechanism?

It could be some

[01:28:34] **Dr Mike T Nelson:** expectancy effect or you're just not used to suffering or I don't know but again who knows but it my air quotes it feels like a loss of adaptation. Yeah, like it feels because I would retest myself at the same thing and it was just way harder and I thought, well, maybe I'm just not used to it, but I would keep going again for a couple of days.

And it, it felt like I was almost like not completely starting over, but it definitely felt like I was weird. I don't know.

[01:29:06] **James Tognarini:** That is very, that's interesting though. It's very cool, because like you said, if you can see, the acute benefits seemed really cool with going back to back with the exercise.

But it's also super interesting at how quickly that, that drops off. Are there, actually this I'm not sure about, but are there more, like in terms of thermal regulation in humans, are there more, are the mechanisms, or at least the pathways simpler when it comes to heat compared to cold?

[01:29:34] **Dr Mike T Nelson:** Not necessarily. I would say if you compare humans to what they're able to do compared to all other mammals, like humans are the two things that are probably. The top things is a brain size and I would say thermal regulation and probably more thermal regulation on the heat side. You can find all sorts of animals that do way better in cold than humans do, but

there's not too many that can do long walking or low level running and pretty high temperatures as humans can.

Other animals can do very short sprints but yeah, ability to heat under exertion. Like they used to do like persistence hunting where they would And just chase animals that died of, heat collapse, basically. Humans are pretty darn good at that when they're adapted.

[01:30:21] **James Tognarini:** That's very cool. Yeah, so I guess maybe it comes from a mechanism from there, right?

In terms of ability to adapt to heat versus cold. There's more research in there too, though.

[01:30:31] **Dr Mike T Nelson:** Yeah, it's one of those areas where, I'd love to see more, especially cross adaptation stuff, I talked about this in the PhysFlexer, but there was a a study where they gave people exposure to hypoxia, so low oxygen concentration, and a group that did not, and then they did cold water immersion directly after.

The group who got hypoxic exposure before reported that the same temperature of water, same everything, They're at least, they're RPE or they're reporting that it wasn't really as bad as the other group.

Wow.

So there's some, there's also potentially some molecular stuff that crosses over between those two that would lead us to make sense.

But at face value, I'm like, Oh, wait a minute. So you put someone in a low oxygen environment, they get better at cold water what the hell are you talking about? So I do think there are some more cross adaptation effects related to those different areas that we just haven't even really looked at much at all.

[01:31:24] **James Tognarini:** Yeah, that's very

[01:31:25] **Dr Mike T Nelson:** cool.

[01:31:26] **James Tognarini:** The next follow up question from that is are they even going to really invest in doing research on that?

[01:31:30] **Dr Mike T Nelson:** Well, that's the thing, like who's going to pay for it? Who's going to do it? Like it's not applied. It's basic research, but it's. Yeah, there's only been a couple of pieces I've seen so far, and they call it a cross adaptation effect.

But, to me, that's fascinating. It's like transfer and lifting. Oh, you didn't do deadlifts, kettlebell swings, your deadlift went up. How the hell does that work? Yeah, it doesn't work all the time, but, it does work sometimes, it's yeah, working on the thing makes the thing better, but we also know working on other things sometimes makes the thing better.

[01:31:57] **James Tognarini:** And that's like the whole, that's what interests me the most in the end, right? Is just trying to figure out. That rubik's cube of performance because for I think for gen pop It's something where like we already have a really good base Like we know how to make gen pop, fitter and leaner and stronger and all that other stuff But it's once we get into that upper echelon of like athletic prowess and we're trying to get people to perform better Figuring out there there's one part of me that's always Oh, we stick to the stuff that we know, and we know what, what works.

But there's that other part where it's like, ah, but what if, and, there's these other cool experiments that we can do. And, some of these things that we wouldn't think would transfer over do. And so that's where, this experimentation with what I'm doing with the jujitsu athletes and stuff came in and figuring out like, hey, like, how can we really, We know what makes, we know how to build pretty good athletes in all these very specific sport domains where they only do this one thing.

And then when we get into non traditional sports where you're using multiple systems, things change on a dime. There's a huge cognitive approach. You're like your performance can change and the sport itself can change against depending on who you're with. Right. And we see this a lot with traditional grapplers, Jiu Jitsu guys going against like wrestlers with really bad Jiu Jitsu, but they just win against everyone.

And it's So, okay, so wait, conditioning and strength and stuff does matter, and then there's other guys where they're just, their technique is just so above and beyond that. Okay, no, so now it doesn't matter anymore. And so, I think that there's, it's so cool to try to find that perfect formula of what transfers over and what doesn't.

But, it's hard to see that in research, because no one wants to pay for that. No one wants to make really good athletes way better, really. I don't think there's a huge demand for that.

[01:33:27] **Dr Mike T Nelson:** Yeah, it's back to, who's going to pay for it. And I used to get crap all the time. So I was at the University of Minnesota.

People are like, oh, well, why don't you go talk to Cal and just use some of his athletes and do a study on them? And I'm like, what are you crazy? If I went and talked to Cal and asked him this, I know exactly what his response would be like. No, get the hell out of my gym. Like you want to take some of my athletes and do some crazy ass program you came up with.

And then compare it to what? A placebo, a really shitty program, like a baseline program, like what are you comparing it to, and his job is to get his athletes the, best performance he can. His job is not to help me finish my PhD or publish stuff or whatever. It's actually extremely to his detriment to let me do anything with his athletes.

[01:34:15] **James Tognarini:** Yeah, exactly. But he hasn't fined, but it's interesting too. Cause Cal, I feel is one of those guys, like I've read a lot of his stuff and he seems like one of those guys that. It likes to be a little bit on the experimental side as well. Oh, definitely. He

[01:34:26] **Dr Mike T Nelson:** does all sorts of experiments and, like for years I go in there and just harass them about, Hey, have you ever thought of this?

He's Oh yeah, we had a squat, we had a 50, 000 squat plate in this. We had this one in this rack, we gave him this internal cue and that external cue. And so, to his credit, he does test a whole bunch of stuff, usually mostly acute stuff that then gets moved into the program, which you can then see chronic training results from it.

But it's just not as controlled as what researchers would like. So my argument for years was just take a researcher and do not a quantitative approach, but a qualitative approach, assign them to his gym for six months. And he writes up a qualitative study of what happened. No one was like, Oh, it's only qualitative.

I'm like, top coaches are obviously doing something that works, right? Or they wouldn't be doing what they're doing. And if they have data to show what they're doing is working. We could argue all day about why, but if it's working it's working. So they're doing more right than they are wrong, and I think just

even a qualitative approach just to, watch those athletes in the wild of whatever they're doing is, I think. Useful as also probably why I'm trying to help them finish, write another book and that kind of stuff. So is that what you guys are doing? You're helping

[01:35:35] **James Tognarini:** them write another book.

[01:35:37] **Dr Mike T Nelson:** Yeah. I'm trying to finish up the tri basic two book, which, Oh God, it's, it'll be good when it's done. I was working on it again today, but. I started it eight years ago. I shit canned everything three years ago and started over. And even now, like I just, I redid the whole training section starting three months ago.

And it's not that any of the info is bad. It's just, you've met Cal and read some of his stuff. It's it's amazing stuff. It works really well. He gets amazing results, but try and do. Explain it to someone who hasn't been with them all that much and is new to his kind of systems of, how do you put it in this kind of translated into a systematic order where it's still his stuff, you're not changing what he's doing, but trying to convey it into a system and a book and a format where people can read it and go, Oh, cool, super max method.

Okay. Oh, here's where I would use that. Oh, cool. Here's the lift. I would do with that. Oh, yeah. Here's the parameters. And here's where I put it in my program. Oh, okay. That's cool. Okay. Cool. Like these little components, so if it works, the whole book will be like the whole one of the whole systems all the way from beginning to end through warm up through transfer training through everything, but then each component you could pull out and insert into, whatever you're doing on your own also.

There's no one's going to probably read a 320 page book cover to cover this is probably not

[01:36:57] **James Tognarini:** I enjoyed every second of triphasic training That was that I thought was a was an incredible book. And part of you know Looking at his courses from there and having met him and stuff too was I still use and that's where I was where I adapted the like indirect sort of training when I was doing with my athletes now in terms of like mixing the intervals was from his, an adaptation of his escalating density training.

[01:37:18] **Dr Mike T Nelson:** Yeah. Yeah.

[01:37:19] **James Tognarini:** Was that's where it bridged from too. Cause I think as far as athletic performance, like coaching and athletic performance, he's he's done so much. And it just so it's been so consistent in terms of the athletes he's been able to put out there that I think to your point, there's something there, he's doing something right. But it is, it's not a, it's not an easy read if you're not like into the industry, it definitely takes a little bit of effort to get into it and figure out what he's trying to say with everything and how to adapt it. Cause it almost is written like him getting really excited about the stuff.

And so it's no, this stuff is happening. And you're like, Oh wait, what was this? And you have to like go back and forth. So it's very cool. Yeah.

[01:37:51] **Dr Mike T Nelson:** Yeah. And that's when the hardest part is. Just putting it into, hopefully this version will be a little bit, I don't want to say easier to understand, but maybe like flow is a little bit better.

And I love the first one. I thought, Ben and Kyle did a great job on it. It's not a knock against that at all. But I think. The evolution of coaches now is that they have less time and they might even be at a little bit of a lower level because we forget that there's so many new people coming into the industry all the time.

We've been around for quite a while. I sound like some old geezer now, but yeah, I get off my lawn. But you forget that there's so many new people coming in to like this, I remember when I started like Polycom principles was like one of the first actual training books I bought.

I'm like, Oh my God, there's something besides three by 10. This is crazy. Five by five from Bill Starr. Woo. That's

[01:38:44] **James Tognarini:** right. That's it. It's totally right. And so like you're, I guess you're trying to make it as more of a, an approachable read for for like new, like strength coaches or stuff that I guess I wouldn't say new, but people who maybe don't have necessarily like the experience or the aptitude to I don't know, dig into research or take a look at things that are a bit too complex.

[01:38:59] **Dr Mike T Nelson:** Yeah. I'm trying to hit what I would say is a pretty high intermediate level, but have the, be a lot of take home points. So if you want to read about the goat drill and what that looks like, and hardcore neurology and eye movements and all that stuff is in there. But if you want to read about just, conditioning, we've got a section on five different conditioning methods and, you So my goal is that people will look at the table of contents and be like, Oh, yeah, I heard him talk about conditioning.

Great. Oh, EDT method or, super endurance or whatever. They can go to that section, take that, and then go plug it into their program and apply it, right? Or super max method or, Oh, wow, I'm, my athletes are super strong in the gym, but man, they're a bunch of pussies on the field. What am I doing wrong?

Right? So maybe, some of the stuff with the transfer training section of, foot position and different, types of lifts to get better transfer from the weight room onto the field, they can take those things and try to apply them.

[01:39:59] **James Tognarini:** I think that would be very cool. If that's what you guys are going for.

I think That's amazing because yeah, you're right. I think reading things cover to cover is going out of fashion for some people and if they can pull a piece out and be able to use it and it's like a complete piece, they know how to plug and play it into what they need.

That's awesome. And if you need anyone to read anything an advanced copy, I'm your guy.

[01:40:19] **Dr Mike T Nelson:** Yeah. Yeah. I'll let you know. It'll be good. I just need to get it done. It's just been taking a while and stuff. It'll probably be as far as the book goes, they'll definitely probably be a little bit more on the expensive side.

But at the same point, I'm like, For 12 years of somebody's brain, distilled into a system for under a hundred bucks, like shit, I do that all day. You know what I mean? I still think there's a ton of value for people that are still seeking it and then I, maybe I'm an optimist, but I still think there's enough.

People in the world who still want to get better who will still do an old school method of buying a book Opening it reading sections trying to understand it and then go apply it like I still think there's a lot of those people Still out there.

[01:41:07] **James Tognarini:** I think so, too I think so, too I spoke about this recently on another podcast also and when it came to learning and like my style of it Was essentially that like you're you the whole reason books and these types of methods and stuff were so interesting to me too was because you're like you said to your point that book is like 12 years of knowledge in the making and so

[01:41:22] **Dr Mike T Nelson:** yeah

[01:41:23] **James Tognarini:** if I read it now I'm like 12 years ahead of where he was when he you know or you guys were when you yeah in that book and so When I, like my method with that was always like, Oh, if I, if there's something I really wanted to know, I, I'd find someone who was really good at it, but that was, call it like an expert in, in, at their craft in that section of the field, I would get any published content they would have.

I'd read through that stuff. And then afterwards I just reach out and be like, Hey, can we, can I ask some questions? Can we jump on a call? Can we do something? And then get into it even more because yeah, that's it. Like you, you get to have a starting point at where they are currently in your seat.

And that's how the. The industry itself advances so quickly and I think that's how everything advances quickly is you just get people who are interested in learning that are starting at this point that people have to work years to get to and then they just use that as A jumping off point for the next thing.

[01:42:10] **Dr Mike T Nelson:** Yeah, and that's that's still why I do the main reason why I do certifications. It's Hey, if you want to learn about, flex diet yeah, it took me God, what I spent 15 years on it so far to date, from research to practice to working with people and yeah, it's expensive.

Like last time I was on sales, a thousand dollars, but 30 hours of coursework. There's 12 experts interviewed. And so far today, do you still get my personal email? So if you have questions, like you can literally email me and be like, I don't really understand this thing about carbohydrates in module 7.

What does it mean? And I will get back to you, which I think is a, it's still a pretty high value because I always think back to I even do this now with new areas I go into same thing as you does someone have a course, does someone have something I can buy from them to get their knowledge in some sort of distilled package?

Right, that's gonna, if there is like a cheat code, and this could be just books to courses to whatever, that's probably as close as you're gonna get. And yeah, it's still work, it's still time, but, yeah, that's probably the best shortcut you can find.

[01:43:17] **James Tognarini:** I agree. I agree. And then from there, selfishly that's what I'm trying to do all these things so I can, make an impact in strength and conditioning for grappling because there's not very much, like we spoke about, so hopefully like one day, I'd have the honor of being the guy that someone would come to and be like, Hey, listen, I did 15, 16, 17 years of trying

to get this thing developed and you get to start where I ended, so, it's like a passing the torch kind of thing too.

And, not, maybe not everyone is looking for that. A lot of people are looking for a quick solution to just know the basics of what they know and work and make money and make a living and That's totally fine but there are always going to be the people who are looking for the industry to take a step forward Consistently and and move everyone forward with it, too.

[01:43:54] **Dr Mike T Nelson:** Yeah.

[01:43:55] **James Tognarini:** Awesome. I

[01:43:56] **Dr Mike T Nelson:** agree

[01:43:58] **James Tognarini:** Very cool, man, dude. This was thank you so much. Thank you so so much for taking the time and doing this call number one because Like I said, I think we've gone far too long without seeing each other even if it's relatively face to face It's over a camera, but hey man technology And and definitely want to do it again, even if it's in a less In a less professional level way.

I'll see you next time I'm outside and are you guys still pretty much in minnesota fairly often? I always see you all over the place

[01:44:21] **Dr Mike T Nelson:** Yeah, we'll be in minnesota let's see most of this Summer we're doing things with the special force experience in canada first part of august i'll be at You Andy Galpin seminar with the rapid health people the second weekend in August, and then I'm not sure if I'll be at the coach catalyst, super coach thing or not yet.

And then I'll be at Mark Fisher's business for unicorns weekend in September. And then iron radio may have a training thing in October. We haven't announced anything yet. We're still working on details and then we'll be back down in self Padre the end of October through November.

[01:45:02] **James Tognarini:** Oh, man, you are you got a packed schedule.

[01:45:05] **Dr Mike T Nelson:** Yeah, so a little few things going on

[01:45:08] **James Tognarini:** Okay, I gotta so I gotta keep track of you to capture one of the courses somewhere then

[01:45:12] **Dr Mike T Nelson:** Yeah, let me know if you're going down to any of them or whatever for sure. Yeah

[01:45:16] **James Tognarini:** for sure Yeah, let me know if you can give me a list of the ones you're doing I don't know.

I didn't keep track of everything you were doing there. Oh, that's all right two things perfect good So, hopefully we'll be able to see each other then and if not, we'll jump on one of these calls again and And catch up, you know Sounds good, man. Thank you so much. Really appreciate it. Thank you so much, buddy.

[01:45:32] **Dr Mike T Nelson:** Bye

[01:45:32] **Dr Mike T Nelson:** So thank you so much for listening to the podcast and enjoy this talk about all components of Aerobic development why you should do some cardio and how to do it with James from frontline Conditioning and on this one. He's more interviewing me So we turn the tables here a little bit so big Thanks to him for all the wonderful questions.

Make sure to check out all of his stuff on Facebook and Instagram, and I believe he has a newsletter too. We'll put links to all of those in the notes here. Enjoy. Thank you so much for listening to the podcast. I really appreciate it. Big thanks to James from Frontline Conditioning for asking me all the good questions having a good discussion here on the old podcast.

Hopefully you've been able to take away some points on how to improve your aerobic conditioning. Make sure to check out everything that he has on Facebook, Instagram, and the newsletter. We'll put links to all of those included here. If you're looking for a great beverage that also has the benefit of ketones, check out Tekton.

It is a exogenous ketone, which is basically a ketone molecule that's been specially formulated to cross the gut and show up into your bloodstream. Unlike a lot of the other exogenous ketones, or these are technically ketone esters, this one tastes pretty darn good. A lot of the other esters taste pretty freaking horrible so far.

There are some other salt products on the market, but really you can't get your blood levels too high with any of the ketogenic salts, unfortunately. And if you

OD too much on those, you will be doing the Wilford Brimley two step in the bathroom. I may have tested that out myself. So check them out below.

We'll put a link there and I am a scientific advisor to them and an ambassador, so I do make a little bit of money off it, but I do really enjoy their products and the cool part is I get to see a lot of the awesome research and all the work that they've done in the background to make this possible.

And if you want more great information, check Make sure to sign up to my daily newsletter. Go to MikeTNelson. com and you'll see it either scroll down and you'll see a box there or at the very top, there'll be a tab for newsletter. Both those work to get you on to the daily insider newsletter for free.

Very similar topics that we talk about here on the podcast delivered directly to your inbox. And again, my goal is to make them informative and also try to make them as entertaining as possible too because people want information from said research studies, but most people don't want to read said research studies, which I totally understand.

And I'm one of those nutjobs that actually loves reading research and translating it into stuff that you can use for Better performance, increased body comp, all that great stuff. So go to mike2nelson. com, check out the newsletter there. Thank you so much for listening to the podcast as always really appreciate it.

You can hit the old subscribe button on whatever platform you're using, or if you have even just 30 seconds to leave us a review, the reviews go a long way to help us with the old algorithms and help us get into more ear holes along the way. So thank you so much. Really appreciate it. Talk to all of you next week.

[01:49:13] **Speaker:** That was wonderful! Bravo! How was great! Well, it was pretty good. Well, it wasn't bad. Well, there were parts of it that weren't very good, though. It could have been a lot better. I didn't really like it. It was pretty terrible. It was bad! It was awful! It was terrible! Get him away from me!

[01:49:25] **Nancy:** This podcast is for informational purposes only. The podcast is not intended as a substitute for professional medical advice, diagnosis, or treatment. You should not use the information on the podcast for diagnosing or treating a health problem or disease or prescribing any medication or other treatment.

Always seek the advice of your physician or other qualified health provider before taking any medication or nutritional, supplement, and with any questions

you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have heard on this or any other podcast.

Reliance on the podcast is solely at your own risk. Information provided on the podcast does not create a doctor-patient relationship between you and any of the health professionals affiliated with our podcast. Information and statements regarding dietary supplements are not intended to diagnose, treat, cure, or prevent any disease.

Opinions of guests are their own, and this podcast does not endorse or accept responsibility for statements made by guests. This podcast does not make any representations or warranties about guest qualifications or credibility. Individuals on this podcast may have a direct or indirect financial interest in products or services referred to therein.

If you think you have a medical problem, consult a licensed physician.