[00:00:00] **Dr Mike T Nelson:** Welcome back to the Flex Diet podcast, where we cover all things to increase performance, muscle mass, improve body composition, all without destroying your health and in a flexible framework. Today on the program, we've got coach Bob Sandoval. From Texas A& M, I was able to finally meet him in person at the NEC conference that I was presenting at this past October.

[00:00:31] He was one of the presenters there, along with myself Dr. Mike Malloy Dr. Kelly Sturette, and a whole bunch of other people over three days. It was a super awesome event, and as luck would have it, I just happened to be sitting next to Beau for two of those days. And in this podcast, we talk about kind of a wide ranging spectrum from metabolic testing to performance, to how would you set up programs just trying to dig deep into how he views athletic performance.

[00:01:05] He's got a really great experience from coaching athletics from the collegiate setting all the way to the highest level of mixed martial arts. And many other sports. So it was really nice for him to share all of his knowledge so freely here. And I'm sure you will enjoy that. And if you want to expand your knowledge, the Flex Diet Certification will open up again.

[00:01:29] This coming Monday, January 15th, 2024. Go to flexdiet. com F L E X D I E T dot com For all of the details And it will only be open for one week So it will close at midnight January 22nd, 2024 So it will only be open for one week And if you go there ahead of time You can go to flexdiet. com right now if you're listening to this And you can get on the wait list I'll have a lot of super cool bonus items for you there If you're listening to this during the week that it's open, you can go to FlexDiet. com and it'll automatically give you all of the details.

[00:02:14] If you missed it, you can still sign up to the waitlist for the next time that it opens. Right now, it opens about twice per year. Go to flexediet. com for all of the information there. One other also disclosure, if you are interested in testing with a metabolic heart, I do some work with PNOE, P N O E, and if you are interested in that, please drop me a note.

[00:02:41] I am an affiliate for them, but I have used their device for quite some time now, almost like four and a half years. And so far to date, I really like it. So if you really want to go super deep down the rabbit hole of collecting your own data reach out to me about that. So enjoy this podcast here with Bo Sandoval.

[00:03:04] wElcome back to the Flex Diet Podcast. And yeah, Bo, thank you so much for being here.

[00:03:10] **Dr Mike T Nelson:** Really appreciate

[00:03:10] **Bo Sandoval:** it. My pleasure, Mike. Thank you. Thanks

[00:03:13] **Dr Mike T Nelson:** for having me. That's kind of ironic that I'm recording this down in Austin, Texas, and you're not actually too far away from where I'm at right now.

[00:03:21] **Bo Sandoval:** Yep, yep. College station's about an hour and 45, and yeah, we frequent Austin quite a bit. It's one of the hub airports that I used to, that I like to fly out of quite often, so we're down there pretty, pretty

[00:03:32] **Dr Mike T Nelson:** frequently.

[00:03:33] Yeah. And you get some good barbecue before you go to the airport or after?

[00:03:37] **Bo Sandoval:** Yep. Yep. And then, you know, believe it or not, it's tough to find like quality Mexican food in College Station. We've got a couple really good barbecue joints, but I can always find better tacos and stuff in the Austin area than what I can up here.

[00:03:51] So that's usually what I run

[00:03:53] **Dr Mike T Nelson:** to. Nice. Nice. And we finally got to meet each other in person at the NEC conference, so shout out to Jason Leiden and everybody there, and yeah, that was super fun, and thank you for your talk there, too. That was great.

[00:04:06] **Bo Sandoval:** Yeah, that was a great time and definitely gave me a better exposure to yourself.

[00:04:10] I really enjoyed your presentation as well. And just the multitude of questions that you feel that I feel like you had a bunch of loaded guns, pull it, pointed out, you know, really good questions all over the spectrum. So, yeah, that was, that was a fun time for me as much as I enjoyed sharing. I mean, I, I enjoyed, I'd say six or seven strong informational talks where I took a lot of notes back and really kind of kept my, my gears busy for a while.

[00:04:37] Still

[00:04:37] **Dr Mike T Nelson:** are. Yeah, that's the nice thing about being able to present at conferences is a lot of the decision process I go through now is do I have something I think is of value to people in the audience, right? Because they're spending their hard earned money and time to get there. And then the second part is, are there other people I want to hear from and, you know, I can learn and hang out too.

[00:04:57] And so that one was definitely fulfilled both of them, which was great and super fun.

[00:05:01] **Bo Sandoval:** Definitely.

[00:05:03] **Dr Mike T Nelson:** Yeah, and that kind of leads into the topic today we're going to talk about, which you hinted on in your conference too, was Kind of the, the sexy role of aerobic training now, which for quite a while has, I don't know if it's ever really gone away.

[00:05:16] I mean, I know at like the college level, a lot of top coaches I've interacted with, I mean, they've been doing it for quite a while. So I don't think it's ever gone away, but it just seems like in the, the popular fitness realm now it's, and you've been around long enough to see all the trends from low intensity to low intensity is worthless to only do high intensity to.

[00:05:37] Oops. We kind of fried a bunch of athletes, so we should probably not do that too. Now it's, Oh, zone two is going to solve all your issues and everyone needs to do zone two, which I think the pendulum on that is probably swinging the other way. And it's probably going to go back to high intensity stuff, three to four days a week, which is probably overkill unless you're extremely well trained or you're not really doing true high intensity.

[00:06:00] So what is your thoughts about this? First off, it's the role of aerobic training. Do you think it's. Underappreciated and especially kind of more strength and power sports. Or what are your thoughts about it? Just in

[00:06:11] **Bo Sandoval:** general, I have a couple of perspectives. I think there are some instances where it is underutilized and in those cases, I think it is bastardizing this idea of what What's your uncle's doing on the weekend that six goes for a trot, you know?

[00:06:29] And I think some of that comes from if you haven't spent or been able to observe or study data from a high level aerobic athlete, understanding what the high end of aerobic capacity and ability kind of looks like. I think we all know what the low end looks like. We can all replicate that. We cannot all replicate the high end That exposure then gives you the ability to understand how much you could dance up and down that spectrum of aerobic intensity.

[00:06:59] I think that's important to understand. And then I always struggle with. Conversations are getting people to think in conversations. Coaches in particular restraint thinking conversations that this idea that if you do aerobic training with anyone that has anaerobic ingredients in their sport, that you're going to cause so much interference that it is going to deteriorate some of the qualities that make them special.

[00:07:26] And I just find that to be a massive fallacy and something that really takes away me. from foundational concepts, how you could foundationally prep someone for a more premier year, a premier season. I also think that it over time deteriorates their ability to buffer byproducts as well as under Prepares soft tissue and and joints and the smaller things around the joints that that really make the chassis stable and endured before we go into all these patterns of higher intensity loading whether mechanically or or anaerobically.

[00:08:06] So, yeah, I think, you know, there's some misconception, but also because you're doing some aerobic training. People have this idea in their head that you've abandoned everything else. We're just doing aerobic training, like aerobic and training can be a peripheral ingredient, contributory ingredient, just like doing auxiliary.

[00:08:27] Bicep curls for a weightlifter or, or, you know, shoulder raises for for a runner or a weightlifter. So it can be a peripheral thing. It can definitely be the meat and potatoes. If that is the game that you're playing. But it can also be a very useful supplementary tool.

[00:08:43] **Dr Mike T Nelson:** Yeah, the interference effect is interesting, too, because we've even seen data that's vacillated back and forth on that and gone through different phases, and it's hard because, as you know, it depends on the context at some point if you really push the throttle on speed and power and aerobic training, you, you are potentially going to run into an interference effect.

[00:09:04] So it is a real thing that can happen. It's just in my experience, the odds of you getting there are so rare in most circumstances. Like you just don't really need to worry about it that much.

[00:09:17] **Bo Sandoval:** You know, if I'm thinking like a indoor 60 meter sprinter, then I'm probably going to have a little more conscience on how much time we're staying in that work zone and how frequently we're visiting it.

[00:09:30] But if I'm working with a lacrosse player or a soccer player, Or a football player for that matter. I agree with you. I think we're we the idea of having such a thick conscience, then I think you're missing the boat a little bit where we could be setting the table for some greater anaerobic physiological gains later on.

[00:09:52] But yeah, that that's usually where the fear comes in with, you know, a running back top tier running back. Oh, I don't want that guy jogging for long periods of time. We're gonna make him slow or we're gonna make him whatever. And sort of over romanticize and thinking you're gonna take that Running back and he's going to be doing 100 miles a week, just not the case.

[00:10:12] So, I think it gets exacerbated in both directions. The same way that an endurance athlete can be fearful of mechanical overload thinking that it's going to cause other tendon stress and things that are going to take away from, from their efficiency and, and those intensities for long periods of time.

[00:10:27] And again, it's not we're going to take them through a regimen for an elite, you know, 58 kilo weightlifter getting ready for the Olympic games. We're talking about supplementing some mechanical resistance training two to three times a week at dosages from a tonnage standpoint that are. Many, many, many percentages less than some of those, those power barbell athletes.

[00:10:51] So it's just, you know, I think depending on whatever stance that the practitioner or the coach is trying to defend, they will over estimate how much aerobic work or, or how much weightlifting work someone is going to do to try to help paint their picture. But in the reality of it. You could be a good chef and sprinkle a little here and sprinkle a little there and make it taste just delicious.

[00:11:14] And the results can be fantastic. Not to mention, you look at some of the, we do supplementary peripheral work, but usually the byproducts are things that everyone preaches about. Recovery, elasticity, longevity. But when it gets down to, well, how do you target those things? The last thing they say is, oh, we're going to do some strategized, periodized aerobic work in with some of our

or some strategized, periodized supplementary strength work that that's not what they choose to describe it with.

[00:11:41] But I do think it is. Less sensitive than we think. I think that the body is more adaptable than we think when it comes to dealing with that and using it as a peripheral tool versus, oh, you're going to reprogram me and now I'm going to be a marathon or all of a sudden. So yeah, it's a difficult concept to sell too, because a lot of times when you're doing those, that type of supplementary work, it is well outside the wheelhouse of that.

[00:12:06] person that you're working with. So you take that running back and you say, Hey, we're going to supplement some low intensity cardiovascular work. It's not in their comfort zone. So not only maybe a little turned off because of fearful, it might make them slow or whatever, but also it sucks. They've never sat still and just churned something for long periods of that, right?

[00:12:24] So and the same for the, you know, the endurance athlete that maybe starts to incorporate a lot more anaerobic training into their work. It's not their comfort zone, so it's a little different and takes a little different learning curve. So having some empathy on understanding that, you know, they got to get their feet wet in it and get some acclimation and literacy around it before they really feel like it's comfortable that it's a big contributor in their game.

[00:12:47] It takes a little bit of time.

[00:12:48] **Dr Mike T Nelson:** Yeah. And what would you use as a working definition of aerobic training before we get too far? Because I think it's one of the mistakes I made early on was, and this is still in a lot of classic textbooks. And I understand when people say anaerobic and aerobic, like I get it, but the mistake I made was assuming that these spectrums kind of end at this, this hard point.

[00:13:12] I've told this story before, but I remember seeing a, yeah. a moxie setup, I think that Aaron Davis had probably almost eight years ago. Now stuck it on this guy's squad gets on a row or a concept to goes all out for 30 seconds, like a classic, you know, Wingate type exercise. And I'm like, Oh, this is, you know, exercise is one on one.

[00:13:30] This is all anaerobic work. This is the speed power. And when you put the MOXIE device on, you can see the O2 level that's being used in the muscle. And I'm thinking, ah, this isn't going to change much. This is all classic

anaerobic work. And what you see is he starts at about 85 percent saturation, and by the end of the 30 seconds, he's down to 17%.

[00:13:50] I remember thinking, Wait a minute. So you're telling me this muscle is pulling oxygen at a crazy high rate. Like this device is bullshit. It's gotta be broken. Like those, you know, it's not, not working. And lo and behold, I ended up meeting, you know, Roger who invented the device and long story short, the device was actually accurate and that just messed me up for probably five to six years of Oh shit, what's going on?

[00:14:12] Like I, you know, had all these nice delineations in my head. What you realize then is that at some point. Everything does run through oxygen. It just depends upon what is sort of your, your priority system. And yes, there is things that are more anaerobic. There are things that are more aerobic, but it's not these on and off switches that magically change at 10 seconds, 20 seconds, 30 seconds, whatever.

[00:14:35] It's a series of dials. You're kind of turning. And the thing that blew me away was that the oxygen use is way further on the quote anaerobic side of the spectrum than I ever appreciated before.

[00:14:50] **Bo Sandoval:** And that's what's what's interesting. All of this can be muddled up just as much as we can attempt to isolate it.

[00:14:57] Oh, 100%. And I think I think that's actually important because in most sports that we're as a strength and conditioning coach that we're working with, we're typically dealing with muddled up energy system demand. We're not dealing with an isolated This is all you need. That's the only one you need. Even in racing events, there are gears to the racing depending on what their strategy is and how they want to navigate their race.

[00:15:23] Go back to your question on just kind of defining like what is aerobic working with athletes and working with coaches. We're not always discussing, well, we're going to stay sub VT one. It's not, it's usually not laid out like that. But more importantly, what I try to teach them is I'll use a couple of things to regulate intensity.

[00:15:40] And one of them is breathing. If we can maintain a two seconds in, two seconds out nasal only, then we're on the lower end of that aerobic spectrum. And that's something I know that even someone that's kind of a novice, we can sustain that. For quite a while. So doing some really low level foundational work, I think, you know, we can sustain that quite a bit.

[00:15:58] The other kind of litmus test, live litmus test that I use is if they can host a conversation while we're doing it. So if I can chat with them, they can chat back and we're good. If we're having to, yes, coach. All right. We're beyond that. We're beyond that point. Not to say we can't target that point, but that just to know we're outside of that lower tier.

[00:16:20] So I use those two readily. They're, they're easy and, and it's easy to explain, easy for the athletes to navigate, you know, whether, what apparatus or what methodology we're using to expose them to. So immediately when you say aerobic, everyone thinks we're going running. Right, right. I have athletes that I strategically tried to dose anything else that has more contributory impact.

[00:16:44] I just want to make sure it's at the appropriate time and we're not taken away from something. So. I go back. I had a coach a long time. They're like, well, you understand, like the heart and the lungs. They don't care or understand if you're running, if you're rowing, if you're swimming, they don't know the difference.

[00:17:00] All they know is supply and demand. And so you give the demand, they're going to supply and that that is that is how they operate. And so, more importantly, gauging these things like breathing cadence and the ability to talk kind of using that as the gas or using that as our thermostat. If you will, and then but other than that, I like to use low intensity modalities when I want to limit impact.

[00:17:25] And I like to use, I should say low impact modalities, not low intensity and high impact modalities when I don't have as much of a conscience about that. So into some sprinting, some heavy sled pushing up hills carrying, you know. Yoke bars and things along those lines into a trot. There's ways to add more impact, more magnitude to each stroke each step.

[00:17:47] And so I'm not prejudiced to any of them. I like versiclimbers. I like Jacob's ladders. I like anything that can cause a variety and metabolic effect. If I want that metabolic effect to be higher. then I'll add intensity either in a form of a resistance or mechanical inefficiency. If I'm some guys, I know that he's not a very good runner.

[00:18:09] I can work him at seven miles per hour on a treadmill and get some tremendous intensity out of it because his efficiency sucks. His mechanical efficiency sucks. Whereas if I take an Olympic crew athlete and put them on the, on the concept too, I got my work cut out for me, getting them into.

thresholds that would be easy to get to with my college sprinter or my college soccer player.

[00:18:32] So, for the most part, personally, with a lot of the different athletes that I work with, I'm usually using that aerobic work as a foundational tool trying to push back and expand on their VT1 threshold, kind of nudge that VT1 threshold back a little bit and that takes, more than anything, it takes frequency and it takes exposure and so, I try not to supply that in one to two bouts a week at two to three hours apiece.

[00:19:02] Instead, it's typically 20 to 40 minutes, three to four times a week, depending on the athlete. So, small doses of venom as we, as we move along the line. And then the other way that I like to use it is there are sports that I work with where weight management and hypertrophy mitigation are a real strategy.

[00:19:24] Those are things that we need to do. And so that low intensity aerobic work can help cause a little bit of intentional interference to mitigate some of those hypertrophic effects. As well as continue a low intensity calorie burn for someone that we're, when we're talking about a real caloric deficit, someone that's really got to, especially in scenarios where they're getting paid for it.

[00:19:43] I'm thinking like professional fighters along those lines. thAt that slow burn is going to contribute towards some of our other processes we have in place to achieve an appropriate caloric deficit so that we can reach an achieved weight. And that's for if you don't make weight, you don't make money.

[00:20:00] So we, we have to use some, some comprehensive strategies, both from a dietary standpoint and a, and a training standpoint. And we have to time that well. So one, we don't starve them to death and they can actually have some energy to do the thing they're supposed to do, which is practice fighting every day and to do it in a fashion to where they're not.

[00:20:18] 1000 percent depleted when they actually step in the ring when they go to scrap. So there are sports that require some very dynamic strategies like that. And that are those aerobic, that aerobic toolbox can definitely be handy to supplement some of those scenarios.

[00:20:33] **Dr Mike T Nelson:** Yeah. And I like that because a lot of times people will say aerobic training.

[00:20:37] They think, well, I just gotta have them go run. It's do you really want the 300 pound linemen to go run? Have you watched him try to run? These are very usually. Extremely athletic people, but I would say running for long distance does not usually look well, like even high level power lifters and people that are really speed and power like I've seen him walk and running just scares the piss out of me.

[00:21:00] But

[00:21:01] **Bo Sandoval:** I think that's important too, was people try to better define what aerobic work is for them. When I mentioned that spectrum, we took a look at some studies that had, and they didn't have giant pools of data, you know, cause these are all just experiments. But when you looked along the lines of VO two max scores from a weightlifter or a sumo wrestler, they were like mid thirties, upper thirties.

[00:21:24] Some in the low forties, very few. Whereas when you look at elite marathoners, triathletes, you know, their upper seventies, low eighties there, you know, it's astronomically different when I got into the professional fighting world, a lot of our elite fighters, even some that were known for showcasing a gas tank.

[00:21:39] This guy can just go. I mean, he can. It's just a ton of work in a 15 minute bout, and they're like in the mid fifties, maybe upper fifties. We had one or two in the hundreds that we tested that were in the low sixties. And so every sport kind of, you know, again, it's a supply and demand thing, but it'll start to cultivate exactly what it needs.

[00:21:59] And so if you want to nudge those numbers one direction or the other, then just simply have to give exposure to what that thing is. But it is it's interesting. You know, when you mentioned like the offensive lineman, the big guys I mean, most of them, if I get them to walk at 3. 8 miles per hour, they're with a good arm swing.

[00:22:20] We can be at 70 percent of their max heart rate like that. And I would argue we can barely be even closer to 80 before we ever get into a running shred. And so it doesn't always require just this, you know, Jog or run or, or, you know, or even a high cadence on a bike or a high cadence on a, on a rowing, or especially the bigger they are and the less the less familiar they are with that modality.

[00:22:44] It doesn't take much for a lot of our golfers. We have, we have two very elite golf teams here at A& M. They both been in the top 10 in the country, I think for the last 20 years, a couple of national championships squeaked in there, many, many PGA players out of those crews. And a lot of their low intensity aerobic work is with a weighted vest at a 10 percent incline on a wood way and they're walking 3.

[00:23:06] 5. Some, some get up close to the 4 mile an hour mark, but not much and that. They're not great runners so that I don't have to worry about all the shin splints and all the achy feet afterwards. You want a golf player to be not focused and to be distracted. Of course, make their feet hurt. That's you're already in a golf shoe, which ain't the most comfortable thing in the world.

[00:23:27] They're walking in college golf. You don't get to, you don't get to to use a cart. So you're carrying your clubs at best. You might be pushing it on a dolly. That gets kind of shamed a little bit. So, too many of them are doing that, but you make their feet hurt. You'll start to see the detriment right away in their, in their stroke play.

[00:23:44] So, yeah, there's, there's a lot of ways to skin that cat. And I just think taking, you mentioned context, taking the context from what's their job, what do they need to be able to do on a daily basis? What can I micro dose with? To keep things productive, but also influence this aerobic pathway that I'm after.

[00:24:02] **Dr Mike T Nelson:** And for listeners, like the numbers you talked about are, are relative, right? So it's milliliters per kg per minute. And I think people sometimes forget that because if you have a large mammal who is an athlete, some of those on a pure absolute number, like if you don't take it per kg. Their numbers can be pretty damn impressive because they're bigger.

[00:24:24] They have bigger lungs. They've got pretty good power output, but when you normalize it per kg, which is normally, especially in the U S LVO two max is expressed, it's kind of almost as unfair comparison to a runner who is very, very light. Now, obviously the runner generally is even on an absolute level is going to be much higher.

[00:24:42] But when you look at the absolute numbers and you compare body size, at They're closer than what people I think realize because we're so used to having that, you know, per kg number that's used all the time. And I've had some larger athletes just drop, you know, 10 to 15 kg and just hold their output the same.

[00:25:03] And they're like, Oh my God, my VO2 max went up. I'm like, well, yeah, of course. And again, that is going to translate to an efficiency because they have to move their body, you know, through space. So if they have a lot of, you know, extra fat to lose, that's another way you can improve your VO two max and get some pickups and efficiency

[00:25:19] **Bo Sandoval:** too.

[00:25:20] I think that's a great point because a lot of times talking with sport coaches, it's not like we're targeting a VO two max number, right? We're targeting another performance, which is that word efficiency resonates really well. And so, you know, athletes can get. As you know, they get obsessed on data points.

[00:25:38] Once they find something correlation, like that's the number I'm after. And then you get something like that. Oh man, I dropped 15 pounds. Look how much my, you know, it's well, you're doing a lot of things, right. At the same time, your training is going well, you've figured out some lifestyle hacks. So, you know, it's, it's really encouraging.

[00:25:57] Hey, this is an all encompassing thing. It's not just a one ingredient fix and then everything else stays the same. That's a really good point, and I think it's important to because of the negative side of aerobic training, people think again, I do aerobic training, we're going to get weaker, slower, all those things, and it's no, it's it's going to contribute to the overall greater good.

[00:26:19] Particularly if your sport involves any sort of capacity at all, which they're most of them do you know, people will argue the thrower and it's well, yeah, they throw and they sit down for eight minutes. Well, their average practice is anywhere from 70 to 140 efforts of practice. That is capacity, no matter how you slice it.

[00:26:37] Especially when you're looking at relative consistency. You want consistency. So if they're throwing a, you know, four kilo implement and they're consistently trying to hit 71 meters with it. Well, if you can only do that for 20 percent of your efforts, I would argue you're doing more negative training than you are positive training.

[00:26:53] And so perhaps there needs to be something in there strategically to boost your overall work capacity. To contribute towards that time of year when you need to be throwing that many efforts but always a difficult conversation

when you get in the room with, with those from that world, which I would say they all eventually come along.

[00:27:11] They all do it and it's it's unfortunate, but usually they have those epiphanies when they go through an injury or they're rehabbing something. Are they like, wow, man, I've been doing this low intensity work and I actually feel really good. I feel, you know, For whatever reason it's yeah, that, that thing, you can do that without getting hurt or without having a surgery or without having a, you know, a midlife crisis.

[00:27:32] So, but it's that's what we do. We spend our whole career trying to educate people onto the idea of better methods and things that will contribute to the bigger picture. And it's just not always an easy conversation.

[00:27:43] **Dr Mike T Nelson:** Yeah. And it, it's also hard because your, your body obviously adapts to where you're at.

[00:27:50] And you don't know, even from just the total energy or volume or output standpoint, how much better you could feel if you say, for example, your aerobic capacity is a limiter. Like I've tested some people and they're like. In the low thirties and they're doing pretty good at their sport. Like they're not, you know, like at the bottom of the barrel, they're doing pretty decent, but I know that, and just getting them into the mid forties, low forties, they're going to feel so much better.

[00:28:17] It's not going to take away from their speed and power. I know they're going to feel better. I know they're going to do more volume. I know they're going to have an output that goes up. But like you said, it, it's kind of a hard sell because until they get to that point, they have to put in all the work in order to achieve it.

[00:28:32] You can't magically snap your fingers and give them the perception of what it feels like. If you could, I think the buy in would be like amazing, but it doesn't work that way. You've got to put in four, six, eight, sometimes 12 weeks to see that kind of nice uptake. And then at that point, they're like, Oh wow, like this feels so much better.

[00:28:52] I feel so much better in the fourth quarter of the game, or. You know, towards the last part of the meet or whatever, but at first I find with those athletes who are already pretty decent, but we have the low numbers and, you know, it's going to be a rate limiter, it's a hard sell.

[00:29:08] **Bo Sandoval:** It is the foresight is what they struggle with at that time in their career because they want to know okay, well, how does this impact gameplay when I'm in a competition, not thinking that if you take that 30 something and you raise it into a 40 something how much that contributes on a daily to their work capacity and practice and in training, not only people, these athletes think sometimes if I just improve my skill And my IQ and how I play in practice.

[00:29:36] I'll be a better, smarter player. I can play better. Well, in order to do some of that too, you need to repetitiously be able to repeat it and repeatability. That is one of those key concepts with, with aerobic capacity. It's the ability to regenerate and then do it again and regenerate and do it again. And our oxidative system, it is that regenerative engine.

[00:29:58] And so that, that is at least where I spend most of my time on the selling point. You want to perform like this consistently, you need to be able to train higher. More consistently. And so to set the table for that training, we gotta have a bigger foundation. We gotta have a bigger slab to build that type of house on.

[00:30:17] And it, it is, it is a, it's a tough felt, especially if they're talented, especially if they're already beyond the curve where they're playing pretty well. They're do pretty good at their job. Yeah. It, it's, and that's unfortunately, that's why you have the breakthroughs when they go through an injury or they go through, oh, we recruited this new player who's.

[00:30:34] It's the best player in the country and now you're having to take a step back. It's oh, me just doing what I've been doing is no longer going to allow me to play at that level because they just brought someone in. That's a caliber above my normal homeostasis. So that's usually when they start to have those kind of breakthrough thought processes.

[00:30:52] But The other thing, and then you let me know if you've noticed this, but as I see the decline over the last 20 30 years when it comes to physical education for youth and some of these PE programs and the dynamics of youth sport and multiple sports, I feel like the overall general work capacity is not what it used to be at the start, and so the intervention is we have to supplement more of it now, whereas before you had There's Kids just had more mileage because they were getting it from so many different stimuluses.

[00:31:26] This is my theory. I haven't run a study or anything, but they were getting it from so many different stimuluses by the time they got here. I mean,

they were just capacity monsters. You could expose them to almost anything, and I just don't feel like that's the case as much anymore. We're running in a lot more of them that just have a lower ceiling height because They're just ability to do more work is just not there yet.

[00:31:47] We spend a lot of time on it. I think that's also helped the learning curve of practitioners to say, Oh, we probably need to pay closer attention to how much foundational work we're doing, how much aerobic work we're doing, even foundational anaerobic work to teach them how to tap into those energy systems.

[00:32:03] I just think that we've got our work cut out for us more now than what we used to.

[00:32:08] **Dr Mike T Nelson:** Yeah, I would agree with that. I don't do a lot of high school work anymore. I did some in the past and a handful of I did then even five years ago, I was kind of shocked. I was working with a female high school soccer team.

[00:32:20] They're mostly all juniors. And the two things that shocked me the most was their aerobic capacity was pretty crappy and their ability to squat was utterly horrible. Like I wanted to throw battery acid into my eyes, you know, it was just like, Oh my gosh, but everything else was great. Like they were super attentive.

[00:32:40] Like they listened real well. They're way easier to coach than guys at that level. In my opinion, I coach women athletes in high school all the time over guys, And even just general population clients I've had over the years, like my lightning flash of the obvious was probably five years ago, which I got from a Dr.

[00:32:56] Kenneth J. My assumption was that people were still moving around and that their aerobic fitness for where they were at was good enough. And what I realized was it wasn't even close. And when I started testing and just doing a 2k on the rower, doing some other stuff, not even using metabolic carts at the time, it was really bad.

[00:33:15] And a lot of people were complaining, like my energy just doesn't feel the same. I'm tired all the time. And. So we go through, we get them training, we get them moving, we get their sleep better, we get the nutrition. Of course, they felt better, but they didn't ever feel like they got to the level that they felt like they should be.

[00:33:32] I started looking at their VO2 max. I remember this, this one, one lady, hers was technically negative by the, the 2k on the, on the calculation, which. is impossible, but it was so poor that just getting her to 50 percent of a population, which, you know, took about six to eight months of work. It was pretty dedicated stuff.

[00:33:53] It was something we were hitting pretty hard, but she felt so much better. It was crazy. Like she lost a bunch of weight, her movement spontaneously went up, like her energy to spend with her kids, like everything was just exponentially better. And she wasn't a huge VO2 max at the end, but from where she started was like night and day.

[00:34:12] And so that's when I started just testing it on everyone and realized that man, if you're well below even average, like that's going to be a hindrance to you, but it's such this slow. And this happened to me too. There's such slow decay that you don't notice it. If a buddy of mine said imagine you're sitting in a warehouse every day that has a hundred lights and every day one light goes out.

[00:34:34] He's a hundred days later, you're sitting in the pitch dark, but it doesn't seem that bad. Right. It's just very slow regression. And so I've, I've noticed that with older athletes, like almost all the time. And like I said, even for myself, like once I started doing more aerobic stuff, I was like, Oh my God, like I feel much better.

[00:34:54] I feel like I did 10, 15 years ago. And it's wow, I'm, this is what I do for a living and shit. I even missed it. You know, I wasn't applying it to myself.

[00:35:03] **Bo Sandoval:** Yeah. One interesting just to kind of piggyback on that a little bit with some of the older fighters, upper thirties, low forties professional fighters in the UFC.

[00:35:15] When they were kind of going through, Hey, I need help. I've noticed that I've lost a lot of muscle mass through my career. I'm starting to deal with some arthritis and achiness, like those types of things, particularly the ones that have kept a high level Aerobic capacity, VO two max throughout their career.

[00:35:35] These are some of our more endurance junkies, the, the cowboy Cerrone's of the world, the max Holloway's of the world, those type of fighters they always responded really well. I believe because of that high level capacity of aerobic work, they'd always kept in there. When we came time to micro dose, high intensity strength training.

[00:35:57] At lower volumes, but kind of building along that spectrum, they could handle it better. They could handle it more frequently and they reap the benefits of it faster with increased muscle mass. Increased power outputs, increased force production. And I think that that a lot of their quick response to that was the fact that they had this massive aerobic engine to them.

[00:36:20] Some of the others that were trying to go through that intervention that were older, that were maybe not as well endowed on that aerobic capacity side did not seem to flourish as quickly or even I would say even they didn't even end up sticking with it long enough because it was just a harder Learning curve for them.

[00:36:38] Physiologically. That was a very noticeable characteristic to those that that had that big aerobic tank. Most of those guys that I mentioned, I mean, they were up in the upper fifties, low sixties in their, in their relative VO two max. It's something to be said for that. I do think too, and I don't know, I'm not educated enough on it to know, but I do believe the chemical response to aerobic training has to have the hormonal response has to have some positive characteristics to it to help supplement all those other responses from either high intensity anaerobic work, particularly I'm thinking like high bouts of wrestling.

[00:37:19] Real high intensity grappling exchanges. I have to believe some of the hormonal response you get from continuous bouts of aerobic work have to be positive contributors to dealing with that type of work

[00:37:31] **Dr Mike T Nelson:** later on. Yeah, that's super interesting because I always think similar. I've noticed the exact same thing and I always then try to think about, okay, can I find any exceptions to that rule?

[00:37:43] And so far to date, I can't find a single one. You'll find people who have very high VO2 max, and you'll find people that have a little bit lower. But I've never found an athlete yet, and they probably exist, who can do high quality work and just do a lot of volume of work that doesn't have a pretty decent VO2 max.

[00:38:03] And what I've noticed is that I can't always tell that by looking at their training. This doesn't necessarily mean that they do a ton of cardio. A good buddy of mine, he's the natural bodybuilder and we stuck him on a rower down in Costa Rica. My buddy Ben said, okay, just, it was a 2k and he doesn't row.

[00:38:21] He does a lot of training and he said, okay, just follow this pace boat. And then my buddy Ryan just hates to lose, like hates to lose. And so I think he

said it at a pace of fricking 647 or something like that for a 2k. And he, he hit it. He about died, about killed himself doing it. And it was, it was crazy to me.

[00:38:43] To think, damn, that's a pretty frigging impressive number. Again, this is not elite level rowers, but he doesn't normally row doesn't do a lot of cardio. But yet if you watch us training, generally very intense, a lot of volume, very strong guy, you know, and he's able to recover relatively fast and accumulate this high volume load.

[00:39:04] Even though, especially off season, he's not doing a lot of cardio, but if you assessed him on a test, like his cardio is actually pretty damn good. So I just noticed that in general with people who can do a lot of high quality work, like I haven't found an exception where their VO2 max was just complete dog shit.

[00:39:21] Like I've seen a couple on testing and I just told them to go get retested and it was a testing mistake.

[00:39:27] **Bo Sandoval:** That's funny. Yeah, that's interesting. And I, that, that resonate, I mean, you always hear the stories from my buddies in the, in the tactical world where they've got this one operator that you can run a marathon, he turns around, he deadlifts 500 pounds, like the next one.

[00:39:43] And, and you're like, you're not supposed to be able to do that. But I think that just goes back to this idea that we might be putting too much stock in this idea that things interfere more than what they actually do. We can be. I have a friend up in New York. Rochester uses this term expert generalist.

[00:40:03] I do believe we have, we have a good opportunity to better be better expert generalists than what we think. We think that if we touch something, we're going to over specialize into that thing. Now, if we touch something else or if we do something else and we want to be specialized in this thing, then it's going to take away from our ability to be specialized.

[00:40:21] And I think we're by design, we're kind of designed to be expert generalists. Not only from an energy system standpoint, but from a movement respect as well. But yeah, it's it's, it's the ongoing thing we go to trying to find the right recipe to get the right attributes to, to rear their heads at opportunistic times and, and then figuring out that there's other things that contribute to those attributes.

[00:40:44] So how do we supplement them strategically? How do we nurture them strategically and, and keep raising the bar? That's always the challenge.

[00:40:53] **Dr Mike T Nelson:** Yeah. And the expert generalist, I think of just the progression with high level CrossFit Games athletes over the last 10 years. You know, if you would have asked me 10 years ago, when I did a lot more work with CrossFit athletes, I would have said, and you told me the levels that people would be at in terms of the Games competitors now, in 10 years, I would have been like, you're crazy.

[00:41:13] They're not going to hit that level of, you know, metabolic conditioning and strength numbers and all that kind of stuff. I'm like, this is not possible. And they did right now. Again, are they as good as endurance athletes? High level? No. Are they as good as Olympic weightlifters and maybe some power lifters?

[00:41:29] No, but in terms of levels of both qualities at a higher level than I would have thought were possible. They're way above what I thought would have been possible in that amount of time. I would have thought there was much more interference, that even the high level people are, they would be lower than where they're at.

[00:41:48] **Bo Sandoval:** Totally. Yeah, it is, it is really amazing what they're able to, to do. At both ends of the spectrum. It is the evolution of the elite athlete. It's it's cool to watch. Who knows what the next 10 years, it's going to look like. We're going to, they're going to be flying at some point. There's not going to be any more jumping.

[00:42:08] There'll be flying around, but. Yeah, it's

[00:42:11] **Dr Mike T Nelson:** wild. What are your thoughts about this idea? So one of the ideas I've had for a while, which I'm sure I stole from someone and I can't remember who is probably from Cal deeds or somebody that I might have been Joel Jameson to but conditioning is one of those things that the response generally appears to be much more average.

[00:42:30] There isn't as great of a spectrum on it. Now you will have. Genetic people who be the heritage study have really high intrinsic VO2 max, right? Lance Armstrong, the, the story with him and Cole's lab down in Texas, as he comes into the lab one day, tells the assistant. He's I guarantee I have the greatest VO2 max that you've ever tested.

[00:42:49] So assistant goes to the Cole and he's Hey man, this, this kid out here says VO2 max ever. What do we do with them? He's well, just test them as they test them. And I don't remember the exact number. It wasn't a sixties or maybe low seventies or something like that. And I think he was maybe not even 18 at that point.

[00:43:07] So you do have those genetic freaks that exist on the end of the spectrum for sure. But it seems like the response you can get from aerobic training tends to be more generalized and most people can improve quite a bit compared to strength and speed and power, like the rate of. Adaptation appears to be more variable.

[00:43:29] And then also the, the level of adaptations that you need to get, you can hit in a lot of cases, pretty high levels within months, not necessarily years. Right. Do you think of like strength development? Like I'm thinking of years to potentially decades to get someone very strong. And even then they may cap out well below somebody else.

[00:43:47] Yeah. The idea is that conditioning and aerobic stuff is something that's very controllable response is a little bit more generalized. So how I train people, like for some of the strongman competitors is if I've got a year to work with them, like it's on me, like if their conditioning isn't up to par, I know exactly what they're going to do.

[00:44:05] I may not know the events exactly, but I know the time domains. I know about how much work they're going to do. So to me, conditioning should never be the reason that they don't do well. Like they, they may just not be as strong as someone else, which, okay, that happens or technique. But I always think that conditioning shouldn't necessarily be a rate limiter for a lot of athletes.

[00:44:24] **Bo Sandoval:** Yeah, that that's another one that resonates really well with the fighting world. I mean, there are two things here. Yeah. They, I always ask this question. What are you worried about? What are you concerned about? The two things they fear the most are missing weight. And then gassing out, that's the most dishonorable thing you can do.

[00:44:44] It means you're not fit enough to even participate in the fight because you can't last 15 minutes of it or 25 minutes of whatever the bout is. And that's an interesting concept. And so that kind of, that had to be kind of high on the priority list of what are we trying to influence? Well, they need to be able to sustain themselves.

[00:45:02] Now, some of that has to do with composure and. Decision making tactical skills because you can definitely take yourself into deeper water than what you're outside of your pace. You're outside of your, your domain. But but when it comes to the raw tools of it, yeah, that's a, I mean, that was always a low hanging fruit, even when it wasn't making sure that we had an engine that they could rely on for the duration of the bow.

[00:45:27] Yeah. And that's why it's so important to make it a, an all encompassing approach, because if you have someone in the back of their head and they're concerned about making weight, and you're not concerned about making weight, you feel okay with where they are and your strategy is pushing. Work capacity and endurance.

[00:45:45] And their concern is saying, Oh, I need to, I'm going to drop my breakfast down by 600 calories and I'm going to take another 500 off my lunch. And the next thing you know, you've got this energy depleted person that you're trying to push their work capacity with. It just, it doesn't work. And so it's gotta be a, you know, an approach from a bunch of different directions and that stance that you took to say, no matter what.

[00:46:09] We're not going to run out of gas. I want to make sure their conditioning is on point. I think that is, it's got to be a top priority. I would argue for most sports because they're not particularly when they're not one instant sports, like a football player, I'm like, you know, yes, you can sub him out, but if he's your best player, you don't want to stop taking 60 snaps, you know, So, yeah, I, I totally agree with what you're saying on that.

[00:46:36] That's a nice badge of honor to have to say that's one area we're just not gonna give up on.

[00:46:42] **Dr Mike T Nelson:** Yeah. And I would imagine for a fighter too, that just the mindset of knowing that relative to your competitor, it's not a rate limiter for you. Right. So the fact that the fight goes to the second round to the third round and beyond, I would imagine that if you know, your conditioning is not a rate limiter.

[00:47:01] Like your mindset is literally the longer this fight goes, the better my chances are because I know I can outlast that person or if not get close enough to him versus, man, if you're, we've seen this happen in USC, like fighters who are really afraid of gassing out, it just appears to me as an outsider.

[00:47:22] They're probably too aggressive too soon because in the back of their head, like maybe they don't think they can go to the third round. It's like you said about decision making, even just when they're going to do things.

[00:47:34] **Bo Sandoval:** If your conditioning is subpar as well, and you're someone that, you know, you're fighting someone who's technically very good, it affects your offense.

[00:47:43] It will affect, it will affect your defense. It will mess with your strategy because you're starting to, you will no longer flow with the fight. You're trying to pick shots and picking shots is very exhausting because it's not like you're picking shot on a dummy that's standing still. You're moving around trying to take your head off.

[00:48:01] So it's yeah. It is just something you don't want to toy around with. You want that to be in your back pocket. You know, I've got that one. That box is checked. The engine's ready to go. Now all I got to do is make sure that I can do damage and I'm not taking a bunch. But easier said than done getting them to that.

[00:48:18] **Dr Mike T Nelson:** Oh, yeah. Yeah. Yeah. And even CalDEETS has talked about this in their PR certification that As your heart rate elevates, your ability to make decisions is just not as good, because at some point at a high elevated heart rate, you know, you see this with military and cops and stuff, there's reports of, you know, gunshot was fired directly behind the guy, but the guy is so focused on a threat in front of him.

[00:48:43] heart rate super elevated that doesn't even hear the gunshot behind him, right? It's not that it wasn't there or you wouldn't have normally noticed that it's like you become hyper focused to the detriment of senses literally dropping off and not registering in your brain if you're walking around like just redlining all the time.

[00:49:03] **Bo Sandoval:** Yeah, vision gets acute when fatigue sets in. That is for sure. It's funny when you look at strike counts and you look at the percentage of landing on, on strikes. When you get past the three minute mark in the second round, regardless of strategy has pivoted all that much, you always see strike rates, landing rates increase.

[00:49:23] And a lot of that has to do with fatigue is starting to set in. And even if visibly you're like you're confident that fighters got plenty to go to the end of the fight, you still see the rates creep up. And that's simply because of what

you're talking about that that vision just starts to tunnel in and more shots start to sneak and land.

[00:49:40] They also has that fatigue. They just don't move as much. Their feet still move a little bit, whatever, but their heads not moving as much. They're not changing their level as much with their body and their torso. These are all those bigger global things that. fatigue just starts to shut down. And so, yeah, it's if you can push that, we talk about nudging like VT one back.

[00:50:01] If you can nudge that type of fatigue threshold where you can keep your higher level systems operating to be able to score and land and defend you're going to have a better chance of winning a bout. And I would say even to be more tactical in any sport, if you can push those thresholds. Yeah, I would agree.

[00:50:20] **Dr Mike T Nelson:** do you use technology like metabolic hearts to measure like VT one? So for example, atory threshold one two lactate VO two max. Do you find that that's useful? And when do you think it's most appropriate to use technology to get more hard data on stuff?

[00:50:37] **Bo Sandoval:** Yeah. We got to the point at the UFC, we were doing it pretty regularly with fighter resident fighters.

[00:50:43] We have anywhere from like 40 to 50 resident fighters over there all the time, lived in Vegas. And you know, they were doing some sort of assessment on a metabolic cart either at a low or a high intensity, such as VO two max a couple of times a month. And then lactates. in fighting in particular, they're all over the map and it kind of depends on the type of fighting that they do.

[00:51:07] When you have more of that perimeter type of striker comes from a kickboxing or a boxing background. They're lighter on their feet. They're typically higher on the VO two max spectrum. You just, when you, when you start to flood them with lactate, I mean, and it's, it's evident in their practices because if I ask those people a lot of times, hey man, let's say your week's congested, you got 14 bout or, or a training sessions lined up.

[00:51:30] If you had to miss one, which one did you miss? Every one of them would say wrestling practice. Everyone I'll miss that. It's the hardest. Whereas you'd see some of our wrestlers like their VO two max scores would be a bit lower but they can swim and lactate some of these guys. We were getting like 14, 15 millimoles and they'd stay there for 8, 10 minutes.

[00:51:51] It's silly. Like Jacare Calvoconti, who is a longtime grappler, world champion grappler. Came to the UFC kind of late in his career, did pretty well a big guy. I mean, I think he cut to middleweight, but he walked around like 215, 218 cut down to 185. We had him on an upper body ERG and we were kind of doing an exploratory assessment.

[00:52:12] One of our sports scientists and we had him hooked up to a Met cart and we were taking lactate. I think once we got up to a certain threshold, I think we were taking it on the minute, every minute. And it got to one point he was that like he was plus 14 millimoles for some stupid like 12 minutes Going through your veins.

[00:52:31] I I just Got off. I he probably wanted to tell me to shut up after a while because when he got I kept asking like How did that feel like when did you feel it setting in like how this is? That was the coolest thing I had seen but Yeah, so we would use those types of things regularly to not only we're in a big discovery phase there.

[00:52:51] So not only to learn more about the processes metabolically that these fighters were going through, but then starting to pick up on, okay, which of these data points can we tug and pull at to influence a better performance outcome? And then you know, Dr. Duncan French out at the UFC, we used to always use this.

[00:53:07] We had this, this acronym. We always use IPOS. What can we do to improve the probability? Of the or an optimal outcome. What can we do to improve that versus just saying, because we started earlier, we're like, what does it take to win? Well, you have to do this to win a fight and do this one.

[00:53:23] If I, and we tried to get really finite on what can we nudge, and then it really got more drawn out to, okay, what can we use to improve the probability of success? We came up with this iPos model. And. For some, it was nudging some lactate buffering skills. For others, it was nudging force production numbers, rate of force development and improvements along those areas.

[00:53:44] So those, those data points and measuring on these highly accurate tools like mech carts or force plates or EMG sensors that they kind of helped us kind of connect the dots a little bit here. Depending on the sport we use. A lot of those things for baseline assessments, and then we'll use those things periodically for investigative process, depending on the event.

[00:54:08] So tennis, for an example, we did some baseline VO two max assessments with those guys and. It kind of reaffirms some things. We have some players that are not power hitters. They don't have massive serves. These are the types of players that like to drown people. They can run all day. The volleys get much longer.

[00:54:28] 22 23 volleys within a point. And they do this for three hour matches, right? You have our other guys who are Typically are 6 2 plus big power serves. Their volleys are typically 12 shots or less. They're trying to kill. They're trying to murder that guy with ball speed. They're also typically better when it comes to ball movement.

[00:54:49] But then when you look at things like their VO two max scores, they're typically a little bit lower. And so, for a sport like swimming and diving, they actually they do a lot of lactate assessment. We have portable lactate sensors will actually do some stuff poolside with them. Our sports science team will do some poolside stuff, not only to look at what are they accumulating.

[00:55:12] In training, but as they start to taper, they want to understand if they're tapering correctly based on because if they're, the more fit they are, the more ready they are, they'll buffer that lactate a lot quicker. When they start to get to that level where they're starting to overreach a little bit, that process starts slowing down.

[00:55:29] So it kind of use that as an indicator to say, okay, we let's back off. We don't need to keep pushing them kind of thing. So every sport kind of has some autonomy with their sport scientists. They're coaching staff, obviously strength staff, and even our dietitians, which play a massive role in all these processes.

[00:55:47] I mean, are we're literally talking about things that were fueled by? And so we all kind of put strategies together once we've targeted. Okay, we got all these assessments. Here's what we're targeting. There's a dietary intervention. There's a physical intervention. There's a strategy intervention, all kind of coming into one.

[00:56:03] I mean, most people describe that as you call it, you know, the high performance team or whatever you want to call it. It's an integrated model to say, this is the objective we're going after. Here's all the resources we have access to. Let's use everything we can use to try to chip away at this one thing.

[00:56:19] So, and then we also have a lot of areas of development here in particular, where. We have coaching staff that aren't used to those type of metrics. We have athletes that aren't used to those types of metrics. So some are in a lower tiered learning curve, getting used to some of that resource where some are much, much higher.

[00:56:36] They got a lot more experience to it, you know, but it's, it's all a process.

[00:56:42] **Dr Mike T Nelson:** Cool. That's awesome. And as we wrap up some more kind of practical questions, you mentioned frequency, which. If I had to pick something, I'm usually, even with lifting, like a big fan of frequency and even aerobic stuff, like for myself and for some of the clients I work with, like we'll have them do a short aerobic session almost every morning if they have access to the equipment, and then we'll, you know, have their training be a little bit different.

[00:57:06] The reason I got into that was a lot of times it's, they just don't have the time per se. And I'm like, if there is any interference effect, even just from a fatigue management session, if I can have them do something first thing in the morning, that's low to moderate intensity, and then they don't lift to maybe the afternoon or they have skills practice later.

[00:57:25] Now I've kind of separated those two and they've got plenty of time to recover from it. But like you said, with frequency, I could do that, you know, five, six days a week. And what I noticed was I could Increase more aerobic training into their current schedule without it affecting their other training.

[00:57:43] And sometimes they're limited with time that they can, you know, be in the gym and all those kinds of other factors too, where they might have a bike or they might have a rower, you know, at home or access to it. Do you tend to program them different times? Do you kind of cycle through days or obviously it's going to depend greatly on the athlete and their needs and what they have access to, but any sort of preferences in that realm?

[00:58:04] **Bo Sandoval:** Yeah, I. When I think of anything that we're trying to improve, we use aerobic capacity in this instance. But frequency gives me a lot of things. I truly believe it is volume that fatigues you not intensity. And so, The other factor on that volume fatiguing you to a point where you can't get much else out of anything else is what are your windows of recovery look like?

[00:58:30] So the more organized the person is or a sport or a coach or whatever, the more organized they are. If we can identify windows of recovery, it is going to allow me to strategize more frequency. Not just day to day, but sometimes twice a day or a little bit more of an undulating model throughout a seven day week.

[00:58:49] The other thing, a lot of strength coaches, sport coaches, they get wrapped into this five day week. Yeah. And they forget it's well, if you train twice a week. That's two out of seven days that that exposure in my that starts to get really risky on how much influence can we actually have over someone's repetitious processes.

[00:59:10] And so in order for me to influence that nudge it to a different direction, I got to have more frequency. I would rather have seven days a week with a 20 percent reduction in total volume that we're doing. And because it's not just. The physiological volume that were present. It's the skill related volume as well.

[00:59:31] If I want to get more refined at the skill and yes, running as a skill, rowing as a skill, cycling is a skill just as much as wrestling as a skill, throwing a pitch as a skill. And so, but if I wanted those processes to increase in efficiency as much as I'm exposing volume to increase their capacity then I got to do it more often.

[00:59:50] So I always back it up when you look at it. Okay, within a week, man, if I can get five of those days where I'm exposing them to a little bit. Great. The other thing that I can't forget about is some of that exposure is going to come from sport training. So what type of sport training are we doing? Can I influence our sport coaches to, hey coach, there's a lot of time in between those two drills.

[01:00:09] Can we cut that down a little bit? Now, it might reduce the intensity of your drill a little, but here's the benefit and kind of lay it out that way. During certain times of the year, that can be a very positive strategy. There are other times of the year we might want those big rest periods in between because we're going much harder in that drill.

[01:00:25] We want the intensity higher. Okay. I get it. So. That wouldn't be applicable, but we can have those tactical conversations and strategize our aerobic work in with practice. And now that practice is also a low intensity aerobic contributor to what I'm trying to do. So you got to take that into account. And then the other thing is, are they fueling for it?

[01:00:45] Are you talking fasted cardio every day? If that is the case, that might start to, when you start to push into some higher thresholds, that could be something that's influencing it. Negatively or or or or might not be. And then What is the rest of the day look like? Can I, if I'm going to do something that frequent, if they're going to have other stuff to do that day, I might have a practice, might have a bullpen for a pitcher or whatever.

[01:01:11] What do my windows look like in between? If I can get three to four hours in between things, that would be great. Two starts to get a little risky. If it's sub two hours, I start looking to try to manipulate my training day a little bit. Or I might even take that aerobic session and move it to a different day.

[01:01:28] Because without the recovery windows, all training is a loss. So I, I want to, I kind of take that stance. If I can't it's like a bank account, right? If I don't have the money to spend, I'm not going to spend it. So if I know I've got a good recovery window somewhere, then I'll push it. Let's push.

[01:01:43] But if we don't, I would rather manipulate the plan and move it around to where it fits. And I would say at the UFC with consulting with. Probably over well over 100 teams remotely outside of Vegas. That was the majority of our conversation. Hey, coach, here's what our week looks like. Here's all our practice planning that you've done all these diagnostics.

[01:02:06] You're telling me we need to do this with the athlete to bring their weight down, or we need to do this with the athlete to push their their power output numbers one way or the other. How do we add more stuff to this plan? Well, usually, well, we need to manipulate the plan. And we didn't always have to take stuff out.

[01:02:21] Sometimes it was just pushing stuff to different days, moving stuff to PM or to AM to create windows so that we'd have opportunities for recovery in between those bouts. With that mindset, I think you can almost incorporate anything you want. But if you're at the side where you're just eliminating all the recovery windows, not to mention have an athlete that's going through the learning curve of recovery, like How to sleep and how to eat the basic stuff.

[01:02:48] It's going to be a difficult process for you.

[01:02:51] **Dr Mike T Nelson:** Yeah. And it's always hard too, because you have the. Ideal circumstance. And then you've got the reality and what their sport coach thinks they should do. And then if you're working with sports that have external things like potentially hockey or swimming or where you can only

do a certain type of training at the facility, like you don't have a pool at your house, you're not going to do it there.

[01:03:15] You don't have ice in your backyard, right? So you're, you're left with I had this call last week, a high level athlete, they only had access to the facility during certain off peak times. And one of the times that they were doing their high intensity interval session, which was their second one of that week was on a Thursday night.

[01:03:34] And they didn't finish till almost 11 PM. I'm looking at their sleep scores. I'm like, what the hell are you doing on Thursday? These are absolute dog shit, you know? But then it's the argument of I'm not the sport coach. So is, if you can move that session, is that second interval session worth the cost of a crappy night's sleep?

[01:03:55] I don't know. I don't have the answer to that. We can kind of test stuff and figure it out. But those are the realities that you're, you're faced with a lot of times too. So you, I always try to. Plan for the perfect scenario. And then it's you know, the perfect plan never makes it through battle.

[01:04:10] Okay, what do we, what do we got to do? What are the big priorities? What are we going to give up?

[01:04:15] **Bo Sandoval:** There's ideal and there's optimal. And then it's really how do you manage a strategy between the both as you evaluate, like you mentioned, going to war that plan kind of, it doesn't have to go out the window, but there are things that are going to get nudged one way or another.

[01:04:32] That is, that's the real world, because there's travel schedules and there's qualifiers and there's, there's just so many other things that come to play. But that's also, you know, as much as coaches, I hear a lot of practitioners, they almost complain about those things. That's the competition part of it, right?

[01:04:50] We're all competitive athletics because I want to take my strategy with my coaches. We're going to put our stuff together and you take your strategy with your coaches and let's see whose shit just rises to the top. That is the, that is the essence of competition. And if it doesn't, we go back to the drawing board.

[01:05:04] We try to reconfigure some stuff and then we come back and do it again. I Think just the competition happens on the field, but all this stuff we're

doing every day, that's part of the competition. We're lining up strategies to see if we can bring, you know, a bigger weapon to the table.

[01:05:19] **Dr Mike T Nelson:** Yeah. My last point I'll wrap up is that.

[01:05:22] I think especially now with the way that college football has rearranged, basically how everything is done for lack of a better word, like you have teams playing other teams and the way the divisions are, like, if you look at schedules, like there is way more time zone shifting than there ever has been before.

[01:05:41] And so I think the next thing is going to be how well can you manage recovery going across different time zones? Because that's. A new element and whoever can kind of solve that problem better is probably going to have a pretty big advantage. I think we even saw a presentation that talked about that at the NEC too, which was

[01:06:01] **Bo Sandoval:** great.

[01:06:01] Yeah. Yeah. It's wild. Now you can just jump a charter flight and, you know, go from the far east coast down to the southern west coast and, and then you're right back home 48 hours later. It's, it's wild.

[01:06:15] **Dr Mike T Nelson:** Yeah. Awesome. So where can people find out more about you and all the information and everything that you have?

[01:06:21] **Bo Sandoval:** Yeah my people get ahold of me on I. G. All the time. That's that's an easy one. It's it's Bo dot Sandoval. Stay pretty active on their love having conversations. I always tell people if you ask or reach out and want to chat about something, I might be slow sometimes to answer, but I always answer.

[01:06:39] And so don't, don't give up on me. It might be a few days or even a couple of weeks later, but I will get back. I love having those conversations. I also feel like, man, there were a lot of people that gave me a lot of information as I made my way through my career and hats off and thank you to them. I'm just going to try to do the same thing.

[01:06:56] I'm just not always the quickest, but have faith. I'll get back to you. I'm not super active on Twitter, but I do have a, it's only strength. I do every now and then repost some stuff on there and get into some chats, but and then

be on the lookout on our TAMU athletics website. We're doing a bunch, we're overhauling the entire thing right now.

[01:07:16] So our strength and conditioning page and the resources that come out of our department here in conjunction with our counterparts in sports science and dietetics and. Sports medicine and and psychology here at Texas A& M. Those resources are going to be a lot more visible and transparent. So keep a lookout for that on our athletics website here at Texas A& M.

[01:07:36] **Dr Mike T Nelson:** Awesome. And watch out for that Dr. Brian Mann running around down there too.

[01:07:40] **Bo Sandoval:** Yeah, that's right. He's our new secret weapon. So we yeah, Dr. Mann, I think it's been close to six months here now. Yeah. And obviously doing a lot of overhaul in our athletic, our academic department contributing to some of their kinesiology and, and strength and conditioning tracks there, both in their undergrad and master's programs as well as some, some contributions to the Huffines Institute, which is our research laboratory that contributes quite a bit with our our athletics department as well.

[01:08:07] So he's. He's definitely giving them a boost and he's also helping them some other talented PhDs that are coming on board here. So a lot of growth going on in our academic and our, in our athletics departments here at A& M. It's a fun time.

[01:08:19] **Dr Mike T Nelson:** Cool. Awesome. Well, yeah, I'd highly encourage people to check out all this stuff you have going on.

[01:08:23] Your Instagram has always got really great stuff. And it's also just awesome to talk to someone like yourself who knows the research, has read a lot of this stuff and has just been in the trenches for decades now. I'll just. Doing it, which is always amazing because I know doing jobs like that full time is a more than full time gig and trying to get information out is always hard.

[01:08:46] So I appreciate all the time and effort here and just sharing everything that you've learned so willingly. That's great and appreciated.

[01:08:52] **Bo Sandoval:** Man, thank you. Thank you for the reflection on that too. It doesn't always dawn on me, but you're right. It's a beneficial journey. It's an uphill journey a lot of the times, but man, it's fun.

[01:09:04] It's fun. I love it. Awesome. Well,

[01:09:07] **Dr Mike T Nelson:** thank you so much. Really

[01:09:08] **Bo Sandoval:** appreciate it. All right, Mike. I appreciate you having me. Please don't ever hesitate to reach out again, and I can't wait to stay in touch and continue having some conversations with you. Yeah, will

[01:09:18] **Dr Mike T Nelson:** do. Thank you so

[01:09:19] **Bo Sandoval:** much. You got it.

[01:09:21]

[01:09:22] **Dr Mike T Nelson:** Thank you so much for listening to the podcast. Big thanks to Bo for all of. The great time he spent with us here and just his willingness to share his knowledge and other part that was super commendable was he was There the entire time of the conference and sitting next to me taking notes So, very honorable and was awesome to see him there.

[01:09:43] Please check out all this stuff. He's got some great stuff starting to go out on Instagram also. If you want to expand your knowledge the Flex Diet Certification is opening again January 15th through January 22nd, 2024. This is literally my complete system of how you would do nutrition and recovery.

[01:10:03] Everything from protein to fats to carbohydrates to NEAT, sleep, macros, micros. And we've got expert interviews with Dr. Stu Phillips about protein, Dr. Jose Antonio also talking about protein, Dr. Keith Barr talking about testosterone and collagen. wE've got many other expert interviews too, Dr. Eric Helms, Dr.

[01:10:27] Dan Pardee, Dr. Stephen Guillén. They're all part of the certification. And in it, you'll learn the concepts of metabolic flexibility and flexible dieting, how those fit together. You'll learn all the details about the research and the theory of each one which is condensed down to each intervention for only one hour.

[01:10:47] And then you'll also learn the five explicit action items. So how do you put this into practice? And I will show you the entire system of how I do that. So go to FlexDiet. com if it's the week of January 15th through the 22nd. You'll have all the details there. If it's before and after that, 2024 you will still be able to get onto the wait list.

[01:11:10] So go to FlexDiet. com. Thank you so much for listening to the podcast. Greatly appreciate it. We'll have much more next week.

[01:11:19] What do you suppose they call that? A novelty act? I don't know, but it wasn't too bad. Well, that's a novelty.

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