

Flex Diet Podcast Neurosports

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SPEAKERS

Michael Nelson



Michael Nelson 00:00

Hey, what's going on? It's Dr. Mike T. Nelson here. Welcome back to the flex diet pod cast. And today is just a solo cast with yours truly nerdy. And I'm doing a report from the Society for neuro sports conference that I was at, in person here in Florida, and just finished up literally just two days ago here. So I wanted to give you some super nerdy rundown on the latest and greatest in neuroscience and exercise phys how those two fields overlap. And yeah, so sponsor, the normal sponsor is the flex diet certification. If you want more information on how to increase your nutrition and recovery, everything from protein to micro nutrition, fasting keto sleep, and more mean a complete system, especially if you're a trainer or coach, this allows you to apply it directly to your clients, go to flex diet, calm flxdt.com there'll be a way to get on the waitlist there. As of this, recording, the next time it'll be open will be around mid April of 2021. And if you're on the newsletter, you'll get something cool that you probably won't get otherwise. So get on the newsletter, go to flex diet.com Fl exdt.com. So neuro sports 2021 just went down here in Florida. This is the first time I've actually been to a conference that was live and not virtual over Skype within almost over a year. So about a year ago, this time when we were just getting back from my buddy, Dr. Ben houses, place in Costa Rica defined everything was shut down. We got to the Houston airport, and you could literally find tumbleweeds rolling through there at like 3pm on a Friday, which that's kind of the first point it hit to me. It was like, ooh, something's going on. Because in Costa Rica, we had just, you know, heard different news reports and different things. But to have been traveling a lot for the previous three years and been through a lot of airports. I had never my entire life seen an

airport that empty, much less than international large airport at 3pm. On a Friday. So yeah, so this past year has been interesting, had much more time. At home. Previous to that I looked to see what was the longest stretch of time I was home for the previous three years. And it was three and a half weeks. So, so quite different. all that to say it was super cool to go to a conference in person. Shout out to everyone who made the conference happen. They did an amazing job with it, it went really well. So big thanks to Dr. Jamie tar tar. For all her work, she did a great job emceeding that Julius Thomas did an awesome job with asking questions. And I think he did a lot of the virtual in person rooms, which I didn't get to see because I was there in person, but the virtual rooms I heard went over really well. And also my buddy, Eric bustillo, for his help all the AV help everyone who made it possible. So big thank you, to them. And little caveat with this is I took almost nine pages of notes, I'm not going to subject you to every little thing that I wrote down, that would probably want to take forever, but wanted to give you some of the highlights. I did a 10 minute highlight here for iron radio recently. So you may have heard a couple of these items on there. The caveat is, whenever possible, I've tried to give credit to the researchers. But inevitably, because a lot of times when they're presenting, they had only a short period of time, I won't have all the explicit breakdown of the exact study group and what were the stats and all that kind of stuff. So if you want that, and there'll be a way that you can probably research it online, but I'll try to at least get the main point across to you. And the nice part about going to these conferences and and having researchers in the field present is that some of this material hasn't even really been published yet. mailing via poster, or maybe some data that they just got approved. So yeah, so that's super interesting and allows you to get really cutting edge information. So if you want to know what is on the bleeding edge in terms of research Going to actual conferences and seeing the live presentations there allows you to get information that you may not have been able to get otherwise in time. So without that, one of the big overviews of the conference was the effect of aerobic exercise on cognition and just having a better brain. That's something I've kind of dived into a little bit more the past four years, I've done more aerobic testing, based on the course that I helped design for the Kerrigan Institute, the caring human performance course, buddy, Dr. Kenneth j, did a really good job with the strength and the cardiovascular portions of that. And I changed my whole entire online one on one model. To use what he's recommended, you can check out his book, The cardio code, which is really good. Dr. Joe Clark is in that program also. So he's coming up here, I he did the fourth module on the neurologic integration. I did the third model for the carry chemo performance program, looking at HRV and more on nutrition. So cognitively, aerobic training, super important, brain health wise, potentially reduction in risk of Alzheimer's and other neuro degeneration diseases. My question then is well, like, how much exercise should you do? And it's sometimes harder to extrapolate from some of the rat data. But we do have human data to the first time I really heard this talked about a lot was john read these books Spark, which is a little bit older now. But if you haven't read it, I

would highly recommend it. I was definitely way ahead of his time when that book came out. So one of the first presenters, Dr. Wendy Suzuki, was looking at cognition and mood. And she found that in a low fat group of humans, even just 10 minutes a day showed benefit. So very little amount. And this kind of makes sense that if you're a lower fit individual, you probably don't need to do as much. They looked at also two to three times per week of about a 45 minute session of moderate intensity aerobic work. After about nine weeks, this was considered kind of sort of semi permanent. This is by looking at structural changes in the hippocampus and the prefrontal cortex, so specific parts of the brain. So I thought that was interesting, because when I run aerobic blocks for for athletes, usually, pretty much across the board, almost everybody reports that their overall energy, that their cognition, their ability to pay attention to stay on task, all of those go up. And I will generally run that for eight to 12 weeks just depending upon where they're at. my good buddy, Luke Nieman for muscle nerds has some great stuff on that he calls it least mode versus beast mode. So a lot of times, if you have a very low aerobic base, doing more least mode stuff can be beneficial. They did see that in some of the mechanistic research that a single session showed an increase in mood and acute cognition also. So if you want some of the benefits of that doing aerobic exercise is very good. For all the other fellow meatheads, myself included, can we get benefits from resistance training? Her thought was the data right now is very mixed. Some of the other researchers had a similar question posed to them. And it seems like the consensus was most agreed that resistance training is probably having neurologic benefits. We know for more development and coordination. exactly what's going on, we don't really know. odds are that they're different effects than aerobic training. She was saying that so far, the effects are mixed with resistance training. But there really just isn't that much data. She did have a great point that if you're doing any type of exercise, this will most likely increase your quality of sleep. And even sometimes your sleep, ability to get to sleep. And this indirectly, the a better sleep will also increase brain function. So I thought that was a great point. Their talk was from Dr. Joe Clark. Again, he's a faculty member at the Kellogg Institute and does a lot of really great visual training. So they've been looking at for many, many years now visual systems post concussion, and they were able to this is Cincinnati code concussions by 80%. With pre training, some visual work in a specific way. So I thought that was fascinating that you can dramatically reduce the rate of concussions obviously we'd like to see like all data replicated at another university but even if it's 40% right or 10% this is a pretty big change they've been doing that for many years they have published that work too he does a neuro baseline on all of their athletes if you start looking at neurologic function it's going to be a little bit different per athlete and per person rather there's going to be some general in averages but you're always going to have outliers and odds are if you've got athletes they're probably going to be a little bit more outliers on the higher end of the spectrum so they have a baseline done on all their athletes beforehand so if they would get a concussion they can retest and see what areas are being affected and how

far they're off from baseline because that's the hard part about taking a hit to the head it can affect many different parts of the brain there are general areas that appear to be more susceptible just due to most likely some of the different stresses and shear stresses the other part too is that it's not always a hit to the head it's any time your brain is decelerating very fast so you could take a very hard hit to your body not have the brain quote directly impacted at all and you could still have issues because your brain is going to slam into the inside of your skull and that's going to cause issues another component you talked about was eye discipline keeping your eyes where they need to be exactly had was a study looking at females soccer players who are heading the ball 96% of them did that initially with their eyes closed they then retrain them to do this with their eyes open what they found was that their rate of concussion when they were heading the ball with their eyes closed was about four per year when they retrain them through some specific visual movement training to do with their eyes open their rate of concussion dropped to one every other year



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and it stayed



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at that rate i believe from what he said almost 10 years so super interesting stuff i think in the future we'll definitely see more ai retraining programs the hard part is you have to do it as a whole system approach there's been various systems out there that i think have kind of gotten close but again you have to respect that it's an entire system and that gets more complicated by the input from your body so proprioception where your joints and your limbs are in space also vestibular input alright those three little balance guys and the inner ear in my case for example i did an eval at dr jeremy schmoes office here in the twin cities minnesota when i was at home and long story short that for some of the eye issues that i have when i would look to the right on just sort of fancy high speed film of looking at my eyeball movement my eyes for a split second would torque so they would actually start to rotate so the eyes are rotating as a normal response if you were to tilt your head so if you tilt your head your eyeball will kind of stay in the middle of your head if you move your head your eyeball tends to stay in the middle of your head unless you've got some pathology so that's a really really fast reflex and in my case my head wasn't moving but my brain thought that it was so for a split second it goes oh you tilted your head let's talk your eyeballs oh but i didn't tilt my head so that air in the system was more of an air coming from the vestibular system so for about three times a day for for next four days they did some other therapies and cold laser and some coordination issues metronome a bunch of other stuff but one of the main things i did is i wrote in this gyro stem this kind of

fancy looking chair where they can spin you in different directions and when they do this they're giving you have a massive vestibular input in addition to eyeballs seeing everything move proprioception and at the end of the four days when they did the high speed film again when my eyes would look to the right the torquing and i'm actually one away and so if i get a better information from that vestibular system and says hey your head is not tilting it's where it should be don't torque your eyeball So what was really cool is that they were able to rewire that they gave me a bunch of rehab drills to do that I did. And now even on a video, unless I'm really tired or kind of stressed out, my head position is much more straight and not as tilted. So in my case, I was born with strabismus or lazy eye. So my right eye sets up and out farther. And because of that I generally see in mono vision I don't see and binocular or 3d vision per se. So I think this was a super, super helpful. A lot of I think people looking at it, myself included, would have said, Oh, it's just an AI, quote unquote, issue. But in this case, it was an error coming in from the vestibular system. So doing more of this stimulator work actually had positive transfer, to better eye function. So anyway, that's my little tiny rant there. One other thing from Dr. Joe Clark's talk, he said, the post concussion they do exercise with their athletes as soon as possible. A lot of times within 48 hours. Again, they're going to be monitoring them, they're going to make sure that everything is good, that they're not provoking their symptoms, because you can definitely make people worse by doing that. But I think we're gonna see a lot of differences. Now we're the old school advice was, Oh, yeah, I got hit in the head. I'm very symptomatic. I'm just gonna sit in a dark room and do nothing for many, many days, two weeks, probably not the best idea. Again, find a good clinical neurologist and make sure they can evaluate and go from there. So one of the thing they do is they play with something called martson balls are kind of these wacky balls, they have different shapes to them, you can bounce them. They've got ones with different numbers and colors written on them for hand eye coordination. And yeah, it was just super interesting talk again, it was a very short talk. One of the things that I've been doing at home is I got balanced board, it's guaranteed I think it's a red board. It's more for surfing, maybe snowboarding, a little balanced on snowboarding is definitely different. And I've been playing around with in between sessions at home is just kind of a break to do some balance work. And then I sort of playing around with juggling on that too. There's a another talk, Chris Bertram did some very interesting stuff where he was on video from Canada, he works with a lot of the top snowboard teams looking at flow and different ways of training. And he had the exact same board that he would do that before calls, or even before some virtual work to train a little bit of that balance which can increase potentially dopamine which can hopefully increase your chance of hitting a flow state. So something to play around with, I found that it's been beneficial for me just from more from a cognitive standpoint. And we'll find out in a couple of days if it's actually transferred to allowing me to hopefully be better. surfboard kiteboarding. So we'll be in South Padre coming up, so I'll keep you updated on that. Next up was my buddy, Dr. Matt antenucci. He runs the centers of plasticity in

Orlando. Also know him. He's a faculty member at the Kerrigan stitute. Really, really great stuff. So he did a short overview, looking at concussions and brain trauma. And his experience from some of the stats they have at his clinic. He says that the average person that they see is three and a half years post concussion. So he's definitely doing a lot more with chronic issues. And a survey they did their average patient has seen 22 doctors before coming to them, which to me is just crazy. One in every 516 year olds will have a concussion at some point. The average recovery is anywhere from one week to three months. And it can be even much much longer than that, obviously, so they've got cases of people that are still symptomatic many, many years later. But the one to three months, you said is the kind of the ideal time to do some type of intervention. So again, some more data that if you feel like you've gotten a concussion recently, you know, reaching out to a professional is going to be in your best interest. There is some data that some of them may resolve on their own. But again, my bias is I get dropped out of the sky like a sack of potatoes on my head, something bad happens or car accident, whatever. My personal bias is i'm gonna go see a clinical neurologist have them do an eval and see what i need to do you know maybe it'll just get better with time which would be great but for me personally i'm gonna hedge my bets in that direction and see if there's anything i can do in the meantime he had a really great breakdown of how your brain works in terms of the different systems involved you basically have motor cognition or sensory so motor cognition sensory motor is more movement obviously cognition is equal thinki part and sensory is just feedback what do you feel now all of these will feed back into each other and it gets kind of messy from the movement people and exercise i found that sensory and motor are highly related to each other if i have better motor function i tend to get better sensory function if i want better motor function sometimes i can go off or getting better sensory function again that can get a little bit messy i don't like people seeking sensation all the time on every lift i think that can predispose people to potentially having more pain but all those systems are related to each other he had some very interesting stuff about sensory information can fix movement disorders he had a video of a patient they saw who had a movement disorder and whenever they would hold up a blue piece of paper whenever we get close enough to encompass all of his visual field that excuse me his movement issues would clean up so he had very what's called dyskinetic movement in his neck he had a hard time holding his neck in place and when they would hold the blue paper in front all of those issues cleared up so really fascinating stuff dr justin rhodes the very interesting experiment this was a i don't know if it was a rat or a mouse model but they tried to only have it do a muscle contraction so the rat was anesthetized and they innovated the muscle and they had to do muscle contractions and what they found was that just by doing muscle contractions the started to produce new neural cells which i find is fascinating because i think in the future we'll find a lot more connection between secretion of myo kinds these chemical messengers from muscle and their effect upon the brain maybe it'll go the other way not so sure because of the blood brain barrier but super

super interesting so the more we learn about how muscle and brain work the more we realize that they are inextricably connected to each other what was even more interesting is that they characterize what these new neural cells were and it was not necessarily neurogenesis it was actually the astrocytes these kind of sort of quote helper cells that were increased by muscle contraction so you could then now hypothesize that maybe movement muscle contraction itself is increasing the astrocytes in part of the brain maybe the release of bdnf brain derived neurotrophic factor from more constant muscle contractions like in a robic exercise is increasing neurogenesis so maybe both of them are working just through different mechanisms so i'm not sure with something like humans and resistance training do you see any preferential differences that we touched on that a little bit not sure but in terms of mechanistic data super super fascinating and they also replicated this in in vitro model so in a petri dish with muscle cells and they found that when they took the medium out extracted it to look for cells that it was astrocytes that they found at that point next doc was also looking at benefits was the molecular mediators of cognitive benefits of exercise by dr christine wren who's both a veterinarian and a phd some interesting data that older women who exercise via aerobic exercise when they did mris they saw an increase in hippocampal volume this is an area of the brain that tends to actually decrease in size with age so again another reason to do your aerobic training they've theorized that this is mostly from the release of myo kinds we talked about those signaling molecules released by muscle so one of the more newly discovered ones is a compound called irisin so when i was at i worked as associate faculty for a little while at the university of st thomas one of the other new full time faculty at that time he did a lot of his research actually looking at irisin so it was always fascinating talking to him about that it appears that this is released from skeletal muscle with exercise irisin has a lot of benefits to metabolism itself they're also looking at markers that go up in relation to eye resistance so kind of precursor molecules from pharma invent intervention this might be beneficial for that they decide that this was mouse data but mouse and human irisin mechanics appear to be similar they do see some increases in pgc one alpha this is kind of your master regulator of some of the benefits from a robic exercise on metabolism also as we talked about increases in bdnf so there's downstream metabolism of iris or metabolite of f n d c five and we're looking to see if it would help a mouse model of alzheimer's and what they saw was it does appear to do that so mice who did this had better learning they do something called the morris water maze so they put the mice in the water and they have to kind of remember this little maze to find a platform that track where they go they did see better learning with that they were using peripheral iris and in this case irisin does appear to cross the blood brain barrier appears also to be having as a benefit via anti inflammatory effects and what was also interesting as they did some looking at activation of amtk you can think of amtk and mtorr as kind of on opposite ends of the seesaw when you increase fasting you do increase a npk right this is sort of the energy sensor in your body also when i did the physiologic flexibility course

there's some data i have in there of in humans doing exercise on depleted glycogen increased npk for up to five days so not only does fasting do it exercise itself will do it exercise this was higher intensity exercise combined with a low glycogen levels again that is not the best for performance but at least there's a study in humans showing them that radically upgraded npk they looked at a small molecule called a car which is ai car i think it is probably available as a research peptide but again caveat do whatever you want with that with your mice at home it does increase the bdnf and increase neurogenesis from a molecular standpoint peers that do that the muscle npk activation no performance data or anything else on that and again this is in a mouse model last part they had this is looking at male and female and humans they did some high intensity exercise and did this two times a week and they saw an increase on memory retention after a task so again more exercise that high intensity exercise and a robic work is good for your brain some really great talks on sleep and the role of the nervous system in recovery and performance my buddy david barr did a really great talk on cns and recovery and he had a good point that recovery is just a return to your baseline and you want to get above baseline right we want to see positive adaptations and some things that we do to increase recovery may not necessarily be the best things to do long term right so an example would be inserts unless you're an older individual ironically dr trappy has some data that older individuals and says like advil may actually be mildly anabolic for younger people in higher doses, probably not the best idea, high dose of vitamin C, even though it's considered an anti oxidant, immediately after training and high doses, again, not the best idea can impair the positive adaptations that we want. Again in the fizz flexor and I talked about cold water immersion, immediately post exercise. So what parameters Do you need for that? Spoiler alert, you probably only need to be worried if you're really trying to absolutely maximize hypertrophy, and you're doing relatively cold water around the 40 degrees least below 50 degrees for 10 to 15 minutes, but it definitely has been shown in multiple studies now to affect hypertrophy. So if your goal is to maximize hypertrophy, a longer sit and the cold water tub immediately post exercise not the best idea, although I would argue there is some other benefits to it. He also talked about sleep as the most anabolic time, probably not. He did some markers and found that people were very catabolic overnight. However, you can circumvent some of this by having pre sleep amounts of protein. So Dr. Mike Ormsby has done some very good research on that Luke van loons lube lab has done some really great research on that. I talked to him at a conference he said, Yep, we have people come in, they sleep in our lab overnight. We give them protein via nasal canula. Right, so a tube down your nose. And then we wake them up in the morning with muscle biopsies. So, not so fun. They've had some really great tips about how to increase sleep using kind of your orange glasses at night to block some the blue light. I've been doing that for quite a while to now we call them our little more glasses. Because we have a book called Mr. Mole goes to sleep.



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And



Michael Nelson 32:00

I find that that's helpful. Getting sunlight exposure in your eyeballs in the morning is also super helpful too. And yeah, so Dave's got a new book coming out in spring, I believe about how to increase arm hypertrophy. I've been fortunate enough to see the advanced copy. And it's really good. So once that comes out, we'll try to get him on the podcast always enjoy his stuff. Some other great stuff, briefly talking on sleep from doctor and major Allison breger. One of the questions was like how much sleep should athletes get? And her thoughts were she's been studying sleep research for about 15 years, probably up to even nine hours a night. Right? So some of the other researchers said average is going to be seven to nine hours a night. So if people are looking for a number related to sleep, that's going to be your number. I know there's some data showing that if you sleep really long that that's not the best for longevity. I'm not so sure about that. I think the data is probably real. But from what I've seen, a lot of times, that's epi studies. And you can theorize that if you've got some disease process going on, or you're not very healthy, because again, in general population studies, you know, most of the people there are not super hard exercising athletes, because of that, that you may need a lot more sleep. So if we just look at a whole population, and we find oh my gosh, look at these people sleeping nine and a half hours a night, they don't have very good longevity. That could be because they have an underlying disease that is requiring them to sleep that much more. So in my experience with clients looking at sleep, or scores, HRV all that stuff for many years. In general, the higher quality sleep, you can get into more sleep, you can get even better. Some athletes like myself, I need on average about nine hours a night or even more. If I'm really pushing it, you know, nine and a half is better, sometimes even 10 hours in bed. So you will get by with less. So again, you'll have to play around with it. One of the things they said I can't remember who said it but how do you know if you're getting enough sleep? Well, you shouldn't be sleepy during the day. sounds obvious I know. Again, not using caffeine stimulants, nicotine, things of that nature. But if you feel like you're tired during the day and you're constantly tired during the day, you will need more and higher quality sleep. Again your sleep quality may be good. You just might need more. So I thought that was seems one of the things that seems very obvious, but very good. Great talk on breathing from Dr. Katie Dombroski. And I just found my head kind of nodding along with a lot of it. She talked about how Breathing is important because we have 20,000 breaths per day. If you can't exhale hard, that's going to be an issue, the one we're exhaling, right, that's more of a parasympathetic drive. If we measure your heart rate variability, and we look at the breathing, when you inhale, we're going to see a slight

sympathetic, right slight stress. And if you exhale, we're gonna see more parasympathetic. This is an A literature called RSA, or respiratory sinus arrhythmia, it's not really an arrhythmia, it's just related to how your body is monitoring all these things, that it will oscillate with breathing, which is why for a lot of the breathing and HRV stuff I do, I'll do a first time measurement in the morning using the isolate system, most athletes will be seated. And with isolate system and has you do what's called pace to breathing. So you'll breathe in and out to this little circle that goes you know, in and then out. So what we're doing there is we're trying to pace your breathing, so that the effect of that natural breathing doesn't affect your underlying HRV. This way, we can remove breathing as one of the things, hopefully get a better idea on the rest of your underlying and background stressors. And when I published data, like an HRV, in the past and journals, and through experiments, I will tend to use more paced reading for



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that.



Michael Nelson 36:29

But yeah, she had a really great talk, check out her stuff. Another part she had too was that breath holding can be a sympathetic stressor, because you do not have that exhalation phase. And she did a really good job of explaining the role of breathing, she had an athlete that came in and talked, who's tried who is qualified now for the Summer Olympics in Tokyo. And just how the breathing work with her is made like a huge difference. What I've noticed too, is that I'll do some in person, maybe some be activated training, have them do some RPR. So reflexive performance reset drills, get their breathing better. And when their breathing is better, their HRV gets better, their sleep gets better. Everything just in general gets better. So if someone says, hey, my HRV is not very good, ie I'm a fairly sympathetic, stressed most of the time. Yeah, all those things like nutrition and as your boss nealon as you do you hate your job, all that stuff matters. But to me, the first thing I'm going to target as a system is going to be breathing. Can we do things to make each breath that you take more efficient, and less sympathetic if we can? To me, that's probably the big leverage point in order to change it. Dr. Wong had another follow up talk really good again, on breathing, broke down a lot of the pathways changes in heart rate variability, he found that there is a large correlation between breathing and low back pain. You could argue there's a lot of correlations between low back pain and many other things also. But hold on. It was this room service trying to kick me out of my room. So he did a great talk about looking at a low back pain related to breathing. Again, lots of things are related to low back pain, great job breaking down all the different components. So breathing, we've got mechanical things going on. We also have chemical things going

on. Shameless plug. I talked about this in this flex cert, again, looking at pH changes, and also breathing effects. So in the course we talked about what type of breathing should you do to maximize recovery or training effect? If you're going bonkers doing super ventilation, Wim Hof stuff all the time, that can add to your underlying stressors. so shameless plug for that. Yeah, he did a really good talk. super interesting. And what I thought was cool is he presented a case study where they did something called capnography. This is just looking at co2 levels and breath and some mental imaging with the high level athlete of a stressor. And they got to watch how her breathing changed and how co2 levels also changed. Also, some very interesting stuff. He had some follow up questions about what is the best breathing method if we want to acutely increase heart rate variability. There is some data I know James Nestor has talked about this to breathing in and out and around six breaths per minute can be helpful. However, he had some studies where if an athlete was doing super deep breaths, that sometimes wasn't always best. And one case study, he showed that more shallow breathing for this particular athlete was better. So my hypothesis on that is that if you have someone where their mechanics are not super great, really pushing them to do deep breathing in and out, may not be the best thing, unless you're really purposely trying to do a sympathetic Wim Hof type style. So just play around with it, you know, a lot of times you can tell by how you feel. So if you're really forcing deep breaths in and out at a low rate, and you don't feel very good, maybe not the best, you can get fancy and play around with some live heart rate or potentially live HRV. And get an idea with that, too. So next up, was that's kind of sort of day one. Again, I didn't get to everyone there. And again, we're just giving you a brief overview of it, they will have the conference again in 2022. So I would highly recommend that you check that out. Starting off day two is my good buddy, Camille, he was a virtual, she was not able to make it there in person. I was talking about applied neuroscience, the making of a corporate athlete. And what I really liked about his talk was, he did an excellent job of trying to break down what are your leverage points? What are things you should focus on? And then how do you get actual measurements in order to do that, which I think is really good. And that's one of the big things that's changed my coaching practice over the years. I mean, I started off using heart rate variability daily with athletes maybe eight years ago. But what I found is that by presenting them with data on their own physiology, that increases their awareness, and then we can have a discussion about what we want to do with that. He presented some really cool data from something called an enchanted wave. And I'll put a try to put a link in the notes here, I don't have any disclosures with them. And it's looking at eg by a single point, and getting some hopefully more accurate sleep data. that's relatively new company. I know he's a big fan of it. And that may be a way to get more detailed sleep data, there was a poster there that presented on and also that had some very interesting data. So if you're a nerd like me, and you remember the old Xeo devices back from God, 2011. Now maybe, where they use accelerometer, and eg you have this headband, you had a wear around your head

and a single electrode in the middle. My wife told me it looks sexy, but I think she was mine to me. But anyway, so that may be something to look at if you're trying to get more ideas on sleep. Good talk from Dr. Gibson about NFL concussions. And unfortunately, there's not a lot of standardized measurements for concussions. So if you get into kind of the legal realm, it gets kind of messy pretty fast. So again, I think it was a good counterpoint to some of the stuff that Dr. Joe Clark and Dr. Matt and nucci did granted, I think you're looking at two entirely different populations to and if there is a lot of money to potentially be made, unfortunately, in the US is a very, we'd like to sue each other country. I'm sure that will come up. Again, a lot more talk on sleep again. Sleep was a kind of an overarching thing. This is from Dr. Banks, looking at sleep and mood. I hope I got the presenter right there. Not someone will correct me. Again, how much seven to nine hours. Need more sleep, most people probably need more sleep. And what was interesting is make sure I got the right presenter here that I'll make a note and the correction if I did might have been Dr. Jennifer Goldstein. But either one of them both of them had really great talks. And one of them was saying that if you wake up one to two times a night, and you're awake for around 15 minutes, congrats, you're perfectly normal. Which was funny because after I heard this talk, literally the next night I woke up at two in the morning and could not get back to sleep. I finally got back to sleep after 20 minutes. And I'm like oh I guess this is normal and i woke up at 330 and after half hour i like could not get back to sleep so i actually got up did some light stuff for a while and then went back to bed and i was okay she had a really great point that if you feel refreshed the next day and you feel good assuming you're not using tons of caffeine in your sleep was relatively fractured you're probably okay i know some people would argue with that but from a clinical pathology standpoint again you're probably going to be good she said if you fall asleep here is the second your head hits the pillow man you'd never wake up and you don't remember anything you are probably chronically sleep deprived and i've seen that an aura data if someone is always reporting that their sleep onset so the second they hit the pillow and boom they're out within like two minutes that's a key for me when i'm looking at their metrics on a weekly review that they're probably sleep deprived she's like if you never wake up at all ever that's what we call a coma so not so good yeah she said a question she had about is napping can then improve mood there's some good data to show that it does increase alertness so a study they did they had a task they had to assess frustration tolerance so how long people would spend on a task i think this might have been dr matthew collins i came into the lab they had two groups one group got a 60 minute nap the other group did not get a nap and to watch a little nature documentary they got a task and then a questionnaire and what they were looking at was how long do they spend on a task so they purposely gave them a little puzzle that was not able to be solved so they measured this pre and they had the two groups and they measured it post what they found was in the napping group was that even though most people only slept for maybe 30 to 45 minutes they spent two times as long on this unsolvable task so if

you're really trying to stay on point caught on task and you're a little bit tired a nap might be the way to go he also talked about a cognitive benefits again with exercise and working memory study where they did 30 minutes of control which was watching march of the penguins or 30 minutes of walking or 30 minutes of running at 75% of heart rate max he was then looking at questionnaires and tasks what he found was there was no difference in the rate of learning although it looked like if you looked at the graph that there was but when they ran the stats they didn't see anything however with walking and running their long term recall with running and walking was better and this was actually measured 48 hours later so super interesting data that if you're trying to maximize your ability for recall that maybe you want to do some exercise some running or robotic work or heck even walking before then work on doing your task according to this study again done in humans that this was way better than watching march of the penguins again more data showing aerobics stuff beneficial but some cool implications for timing so what i'll do if i have some continuing ed stuff that i'm working on especially if it's harder stuff or harder studies different things i'm trying to memorize this for my own knowledge or for a talk i'll do my aerobic training in the morning go for a walk and then immediately after i'll actually work on that task again i wasn't familiar with his research before but what i found was it just appeared to work better from a focus standpoint and maybe there's some very cool data related to recall ability also again there's some other great talks i won't spend too much time going into here dr jose antonio was the lead chair for an afternoon and talks about sports supplements looking at everything from energy drinks which is something i've published on before you can look up the link to it also the g iss and review of energy drinks position stan and then we also have the brand new as of a couple months ago new updated position stand on caffeine so i was the third author on that one which i'm so happy that it's out because that



49:59

yeah



Michael Nelson 50:00

took about three and a half years, I won't bore you with all the details. But putting together these position stands is not an easy task, especially on something like caffeine where there's literally 1000s of studies. And even though we've got a couple main authors, trying to make heads or tails out of it, and get it into peer review and out a lot of time and effort, but super great for the consumer, because they're all open access. You can go there, and you can look at all of the studies. Yeah, so some interesting data there. One of them was that mocca was 2.1 grams, I don't know if that was once a day or three times a day, may increase grip strength, and within 21 days, so that was interesting. And Dr. Doug

Kalman talked about some other new ingredients, new level, looking at that it increased some performance, there are cognitive flexibility. And I also just realized that supplements for EA gamers is like a huge area. I've know some supplement industry people that play in that area. But again, I guess I didn't realize how big of a market it was. Many years ago, I was talking to a buddy in LA, about he was working with some EA gamers and I was like, Wow, that is a much bigger area than I ever imagined that it was. Last couple talks, which were good talking about the mind and body approaches to exercise. The first guy was Michael, manual. And fascinating guy, he's definitely more on the computer science kind of math modeling area of it. But a book, he recommended them in a pickup called the embodied mind. Talking about that attention is more of a filter, not necessarily a spotlight. So the brain is better at filtering stuff out, not necessarily more focused derived, they're talking about the mind versus a body and how they're basically just inter created some cool experiments they did with looking at how your brain is able to do self organizing, and is emergent, and and as following dynamical systems. So self organizing, he referred to like jazz musicians, how they can kind of organize together. emergent is something called an emergent property you've ever seen, flocks of birds fly, that's considered an emergent property, where they're actually all just going off of local rules of how close to maybe fly next to the next bird. And if you put all these together, you get a complex system, or an emergent thing that happens. And then, of course, dynamical systems, right, and nothing's really, really static. Things are always moving in place. So yeah, it's a great talk one of those ones, I wish I need to go back and watch again, who is talking about flow is actually an embodied state. And some of the different flow triggers. One of the big ones was deep embodiment. You give the example of people doing slack line, how they felt like they were much more present with the slack line itself, that kind of deep embodiment as a trigger for a flow state. And when the other ones was Dr. Chris Bertram, I talked about, again, he's also looking at flow works with the high level athletes in Vancouver. He had a cool term, what I like is that he said he left the quote, formal academic area, and now works in the living lab. So I thought that was a really good. Um, one thing that is historic that was super interesting was they took musicians, jazz musicians, and put them in an MRI. And when they were doing more improvisational jazz, and again, I'm not sure exactly how they did this, that they saw big changes in their default mode network that it actually went down. And when they were doing more rehearse type thing is a completely different signatures in the brain. And I thought that was like really fascinating. Or default mode network is kind of something that's always running, quote, unquote, in the background. So initially, they kind of found this by putting people in an MRI and said, okay, we need a control phase. So just go on the MRI, we're not going to show you any pictures. We're not trying to trigger your amygdala or anything like that. There's just hang out and do whatever. And people are probably hanging out in there daydreaming, whatever, and they see changes to this part of the brain, which turns out to be the default mode network. There's also some of the studies like Dr. Roger Carhartt

Harris has done looking at the effects of psychedelics like LSD. On the brain, they've given people, different compounds like a deluxe and actually MRI image their brain. And they see very big changes in this default mode network. So really fascinating stuff. You also had a good point of that we need to learn to self regulate our brain as an output. And his tip I mentioned to about doing some vestibular sort of challenge balance activation, can engage the vestibular system, and that can upregulate the release of dopamine. Dopamine is one of those hormones, neuro hormones that's needed for a flow state. And dopamine is more related to derive, I guess, you can look up Dr. Andrew Huberman stuff on dopamine rods really, really good. I'm actually finishing the book called dopamine think the molecule of more, I'll probably link to that in the show notes too. But super fascinating. So overall, really great conference, again, really enjoyed it. Obviously, I'm a big fan of the neuroscience then exercise and the overlap. So it was great to go to a conference that had really great presenters awesome place. And, again, even just the conversations you have with the presenters, and with all the other attendees, there was good. We had a little breakout session with Eric Cousteau about the role of nutrition in all this too and had a really great chat with the group. So we'll check it out. Not sure when the dates are for next year yet, but you can look at the link we'll have one here. Society of neuro sports. There you go. Hopefully you've gotten some good takeaways from this. If you'd like to all the nerdy goodness, make sure to sign up to the daily newsletter, go to [flex diet. com](https://flexdiet.com), get on the waitlist there and then I'll put you on to the daily newsletter for much more. Thank you so much. Talk to you soon.