

Aerobic Work and Testing for Lifting Meatheads

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Hey, what's going on? It's Dr. Mike T. Nelson here back again with the flex diet podcast. And today is just a solo cast with me. And we're going to talk about a robic training for those who primarily lift weights. So if you're into lifting weights for whatever reason, or CrossFit or even powerlifting Olympic lifting just want to be healthier lift heavy stuff, then we're going to discuss why you should do some a robic training. And today's podcast is brought to you by the fist flex certification. This is based on the concept of physiologic flexibility. As you know, with the flex diet surge, the flex diet CERT is primarily focused on nutrition and recovery, using a flexible approach, teaching your body how to use carbohydrates and fats both effectively. So how can you have the flexible metabolism and transfer back and forth between those two. So the physiologic flexibility surd is taking that idea and concept and extrapolating it up to you as an entire organism. And so there we're looking at what are the four main regulators of homeostasis. Homeostasis is the state that your body wants to get back to. So what are the four areas your body absolutely has to hold constant, in order for you to survive? These are things like temperature, pH, fuel systems, and air oxygen and co2. If you trained those specifically, I believe you can become more robust, increase your recoverability if recoverability is a word, and just generally be much harder to kill. There's lots of great stuff out there on those kind of independently, but didn't see anything that brought all of them together in one system. So with all the cool stuff going on, where should you start? Should you be doing cold water immersion? Should you be taking a sauna? Should you be periods of fasting, keto? What about breathing techniques during exercise? Should everything be nasal breathing, or not? So all of those concepts are covered in that certification. So go to physiologicflexibility.com, they'll also be a link here below. And how this transitions today into a robic training is hopefully one you didn't turn out already. If you like lifting heavy stuff, and you're like, Oh, the stupid nerds gonna tell me to go start running marathons. No, you don't have to do that. The reason that this is important, is my argument. Your metabolism is primarily or possibly entirely based on your aerobic system. Now I know people who have taken bioenergetics in school, and I am incredibly guilty of teaching this to students, and having it written about in national magazines and everything else. We've all seen that bioenergetic table of, well, it's the ATP PC system, that's one to 10 seconds, and then it's, you know, fast glycolysis and slow guy calls us and if you're doing a sprint for 30 to 60 seconds, you're only using carbohydrates during that point, it's what they call anaerobic training. And all of that is kind of sort of true, but not really. So how I ended up going down this path was probably seven years ago now. I was at the design of medical devices conference here in the Twin Cities, Minnesota.



It was even longer than that, because I was still working for a medical device company at that time. So it might have been even before that. So in the past, I worked for guidance, and then was later acquired by Boston Scientific. I worked in the Division of pacemakers and implantable defibrillators. I was in technical service for a while and then I transferred to Leeds development. It's a little wires that go into the heart. And I transferred back to tech service when I was going back to school to do my PhD. So while I was there, I got to go to the design of medical devices conference at the University of Minnesota. And one of the guys there shout out to Roger was presenting this sensor that you could stick over a muscle and would tell you by using something called a nears technology, which is where they reflect a little bit of light into the muscle. It will would be able to tell you how much oxygen it was using. So we've all seen those pulse oximeters, which fires a little bit of light. And that can tell you on the arterial side, right, the high oxygen side, what percentage is saturated, right? So for healthy people like 97 98%, you probably don't want to hit exactly 100%. But you want to be pretty high. So it's that same idea. But now we're applying it at the muscle level. So normally a Moxie sensor is applied over the quad, but you can put it over other muscles wherever you like, on the body, uses that same nears technology, and gives you an idea of something called smo to button English, just how much oxygen the muscle is using. And that was either there or was my buddy Aaron in Texas, I can't quite remember



sort of video of someone doing a wind gate to high power output for 30 seconds. We used to torture people in the lab with that very brutal. So historically, you'll get on a bike, you'll start spinning the bike at a really high rpm with a very low load, save 50 or even 100 watts. And then when you say go, you transfer the load to be really high. Like there's different equations to figure out how much of a load but for most people you're looking at, they have to now generate 300 400 Even 500 watts or more. So it becomes very difficult to pedal at that point. And it is a very brutal test. When I was watching this, they had stuck a Moxie sensor over this athletes quad. Now historically, you would expect that this is a purely anaerobic event. So anaerobic meaning it is not using oxygen, right. So the basic definition of something that is aerobic is it is using oxygen to create ATP or energy for the body for the cell, I would have expected that this oxygen sensor then the Moxie sensor would not really change, right? I've been classically taught this is a robic exercise, therefore the muscles not really using much oxygen. And what I saw was the direct opposite, it started off near around 85%. And then by the end of the 30 seconds, was down near 10%. Meaning that at the end of just that 32nd period, the muscle was extremely a robic it was pulling as much oxygen as it could so much that it's what they call D saturating that, right, so you see your percentage be real high. And then the percentage ends up being real low. Reason it's lowest because it's being used by the muscle. Now again, there's a whole bunch of assumptions that, that go into this and the use of nears technology, and Moxie. What layer are you looking at how deep does a light penetrate and so there is a fair amount of assumptions and some contention here. But what baffled me was that didn't match what I had been taught my whole life. And so this then proceeded to bug me for many, many years, my first thought was, well, maybe the little sensor, the marks that he put on there wasn't very accurate, it turns out to be relatively accurate, at least for a one off type assessment. If you get into comparison of one athlete to the next, general trends, you can probably observe, but it gets down into the weeds real fast. All this comes back to I think most everything we do is based on a robic training, that if it is true, that high intensity output will start sucking oxygen right away, right the muscle is using oxygen, then the aerobic component of all training is very, very high. So how to explain this to students now, and other people in the

mentorship and the physiologic flexibility CERT is think of the aerobic use as a dial not so much an on and off switch. Right. So as you become more intense exercise, at some point, you are going to use more oxygen. It is true that you can sprint or do output of exercise with no air exchange, right holding your breath. And you can do that for a short period of time, which again, I would not recommend we don't want anyone passing out or an exercise. However, when you're done, your breathing rate is still going to be quite elevated, right? You've kind of sort of delayed the aerobic component there and this gets into epoch, oxygen debt, etc. So going back to why this is practical to you, and even some clients To train is I've done a robotic assessment on appliance now online, started that probably about three and a half, maybe four years ago. So typical complaint would be client comes in, they're like, I don't know, like, my energy level just doesn't feel very good. I get just really hammered. Whenever I do any exercise or higher volume.



I just feel like you know, 1015 20 years ago, my energy levels were a lot higher. Now again, energy levels, fatigue, that can be related to a bazillion different things from a little iron, just poor lifestyle, lack of sleep, too much caffeine, not enough calories, poor nutrition, and not enough micro nutrition, all that kind of stuff. But what I found was, once we got all of that stuff taken care of, we're pretty good on track, right? All that's in the flextight cert, some people still were having the same complaint, and they appeared to be very intolerant as we would increase the volume, or the amount of work that they would do. So once I realized that, hmm, if this is all really truly Arabic, maybe we should test or look at an assessment of something called their vo two max. So VO two Max is simply the volume of exercise or I should say the volume of oxygen, you can pull during Max exercise. So typically this is associated as a marker for aerobic performance. Now, again, VO two Max doesn't absolutely guarantee high level of aerobic performance. But it is one of the factors that does play a role. And if your VO two Max is very low, let's say in the 20s, or the low 30s Xara, you are not going to be an elite a robic athlete. However, just like training in the gym, you can get stronger, you can increase your VO to max to a pretty high degree. Again, there's some stuff saying that this may be limited by genetics. You can look up the heritage trial, which again was done by art Leon at the University of Minnesota, he was still a professor there I think is probably in his 80s when I was there. And that study showed that vo two Max does have a very high genetic component. So you will find some freaks who just don't do a lot of aerobic training, and they can still get away and do quite well. Yeah, that's not gonna be everyone though. The good part is that a robic performance, I feel is relatively trainable. And it's trainable, usually in less time than max strength. If you think about how long a time course it's going to take someone to reach a true sort of genetic plateau of their strength. You're definitely talking years and most likely decades, right long period of time. However, I think with a robic training, you can get to a very high percentage of that in probably months to maybe a couple of years. Right, but still a long timeframe. But I think it's much shorter than max strength. The good part is that this means it is a trainable thing, right. So like genetics, right now, we can't really do anything to change genetics, you can have a discussion about epigenetics, but your genetic DNA can go back and pick different parents. You're kind of stuck with that. So while it's an interesting topic, it's not really currently trainable or even altered. So how useful that is to you training? Yeah, I'd say not super useful. So we talked about aerobics stuff as a dial, you're using a certain percentage of oxygen dependent upon exercise intensity, if we crank the intensity all the way up, and we do this using a movement that includes a lot of your musculature, right, so classic cardiovascular exercise. So this would include cross country skiing, biking, rowing, Versaclimber and running, right swimming for vast majority people. It might be up there, but it's so technique intensive,

because of the resistance of the water, probably not going to be able to do that for most people. So doing any one of those five modalities. You can get a $\dot{V}O_2$ Max, right, you're moving the high percentage of your body, you're working lots of musculature, but you're doing it over the course of several minutes. Alright, so what I like to do for rove IQ test, a max $\dot{V}O_2$ to test or peak $\dot{V}O_2$ to test if you want to be technical. You can do something called the 12 Minute Cooper run. So you can look that up. Just type in 12 minute Cooper run online, it'll pop up and you literally warm up. Set a timer for exactly 12 minutes. Use a phone or a watch with GPS or you can be on a track and know exactly how far you go. And then run As fast as you can, with the goal being to cover the maximal distance in exactly 12 minutes, put that in an online calculator. And then you can determine your $\dot{V}O_2$ to max. And it's relatively accurate, right?



I mean, another method is going to be doing something with fancy lab equipment that they call indirect calorimetry, or a metabolic cart. So I did a lot of this when I did my PhD work. And you've seen it on pictures, and probably in videos, got a bunch of tubes coming in and out of your face a mask over you. And the machine then is measuring all sorts of stuff, like how fast you're breathing, the volumes of air you're exchanging. And the fancy ones also measure what percentage of that air is oxygen and CO_2 . This allows you to then calculate things like the source, or the fuel that is being burned. This is called your R_{ER} respiratory exchange ratio. In English, that is how much fat versus carbohydrates you're using with each breath, what's called breath by breath calorimetry. So I have a device here at my place, that is the P N O E, and as a mobile metabolic cart, and people want any more information on that they can contact me, I also have a three Moxie sensor here too. So this allows us to then look at you as an athlete as a person during exercise with a metabolic cart, or in my case, a piano we, we can then determine at a system wide level, how much air is going in and out and what percentage of oxygen is being used. Now with the Moxie sensor, we can stick it over a muscle and get a local idea of what is going on with oxygen use. So using those two systems together, we hopefully can determine what may be a limiter for performance. So the other way if you don't have fancy equipment, like all that kind of stuff, which is great but is expensive. You can do a to K test on a concept to rower reason why it's a concept two rowers because that's where the equations were validated. You can find these in most gyms. I don't make any money from concept two, but I do think that if you're going to get a rower, that's by far the best one to get. So you warm up, get on the rower, set the distance for exactly 2000 meters. And then you roll as hard as you possibly can. And again, just like the Cooper run test, it's not much fun at all. So I've had a few courses here. I've had some clients come out fly out to my place. And we've done a max 2k test with a pnone device and with some Moxie and they can all tell you it's not real fun. The one time one of the neighbors didn't know we were doing this she was outside and she's like hey, some girl just ran out of your garage and looks like she might be puking on the lawn over here. She didn't puke but didn't feel very good. So a max 2k test or even a cooper run test. Again, not super fun. On the concept to the 2000 meter the 2k test. I go to the old Google's again and type in concept two $\dot{V}O_2$ max test and all the information there will pop up. So you put in your info and it'll tell you what your $\dot{V}O_2$ Max is. So this is a good marker for the highest Rubik work you can do. Now it is true, you can sort of go over that amount for short periods of time. You can do some stuff that is a higher percentage of that. Right if you look at some of the Tabata research that was done with 170% of $\dot{V}O_2$ T max, but again for very short periods of time, we're looking for a plateau in oxygen use or even though you might be able to do a little bit more work for a short period of time. We're looking for this plateau amount that is the maximal volume of oxygen your body can use.



Again if we compare this back to weight training, this would be similar to your one rep max for any particular exercise. And there is a little bit of difference if you do it running or a rower and if you are a high level rower not a high level rower, but the goal here is just to get in some ballpark and there's lots of population data to compare yourself to. So back to the one client I worked with a couple of years ago. She came in we got all of her habits pretty good did a lot of great work. She was doing exercise, but she still didn't really feel up to par. When we tested her VO2 max. She was actually in the bottom 10% of the population. So we retested her a week later, still around the same percentage. So her aerobic system was extremely underdeveloped. We did some training with her. We also did some specific aerobic training. And six months later, she was up in, you know, just below 50% of the population. And she felt much, much, much better, right, because the basis for most of your energy creation is actually the aerobic system. So even in the Standard Model, as we're sitting here, walking or whatever the heck you're scrubbing dishes listening to this podcast, you're primarily using your aerobic system for those daily events. And if your aerobic system is real low. In essence, you're redlining yourself all the time, just doing daily tasks, much less exercise or things that are higher level, right, so to clients explain it like, if we run the VO2 max test, and you're in the bottom 10%, you're literally driving around in a two cylinder Hugo with one tire about ready to fall off, right, it's just really hard to create any speed, like sure, you can redline the Hugo and get some speed out of it. But it's gonna come at a very, very high cost, right? Normally, we see very low or very stressful HRV scores associated with this heart rate variability. Once you develop the aerobic system, then it's like installing a bigger engine in the car. So now you're up to a six cylinder or an eight cylinder, it's much easier to create that aerobic power, right, you have a much bigger engine all the time. So that's one of the reasons why aerobic training is important. Now again, for most of you listening to this, you are primarily lifting weights, if you find that your ability to recover from one session to the next, especially after you have all the basics in place, rest is good, calories are good, proteins, good micro nutrition, etc. And you just can't seem to add more volume, you're either doing a stupid amount of insane volume already, or I would bet your aerobic system is not as developed as it could be. And that may be your rate limiter to doing more work. Even if you want to just add more muscle, most of the research at this point would say that the primary way to do that is by volume. Again, there's a whole bunch of idiosyncrasies with that that's not the only method. But I would say that's probably has the best evidence. So far. In order to do volume, you need to one recover from one set to the next set. And then from one session to the next session. And those are going to be primarily governed by surprise, your aerobic system. So hopefully, I've



sold you on the fact that the aerobic system and in this development is important. Again, you do not need to get to the point where you are running marathons or anything like that, from my buddy, Dr. Kenneth J. I kind of like his recommendations. That if you use say the concept to rower as your mark, and we compare you to a database of people who are already rowing, again, that is a kind of bias to database because they are physically active. But we have lots of data from that, because there's an app you can use that will allow you to collect it, and it goes into their database. And then on there, once you put in your 2k time, you'll get a comparison there of you against all other people in the database. So if we use that, as a rough marker, I found getting people to just the 50% mark, a huge difference in their ability to recover. I think if you really want to push the envelope, going from 50% to say 75% of the population, probably a

good idea. Now again, that will go from 50% to 75%. For someone who is not going to be dedicated to be an elite rower, you're not primarily an aerobic athlete, that may take you know, a couple of years. So in all honesty, I'm still working on getting to the 75th percentile with my 2k getting closer. So my goal for that would be a time of seven minutes, 10 seconds. My last PR was about 728. So getting closer. So hit the 50% mark. And then from there, if you want to decide to go further to the 75th percent mark, probably going to be some benefit going from the 75th percentile up to the 90th percentile. Now you're really starting to reach that flat part of the curve where yes, your rubbish system will be more developed. But you're not going to get nearly as much bang for your buck and you're gonna have to dedicate more time and more resources towards it. If your goal is to be again, an elite or high level rower, aerobic athlete, yes, that's useful if you're trying to do more strength training. Yeah. Really, really diminishing returns at that point. So step one, do you have to do a max test see where you're at to look at the population score, the population score is going to be based off of your VO2 Max. For pretty much everyone I want them to be, you know, up near Excellent. If you want to take it a step further and you have a rower, use the concept to rower, do a 2000 meter 2k test, and then compare yourself to that population that is on the concept to site. So that is kind of a little bit more of a rowing fitness specific population, get to the 50th percentile with that. And then you can decide if you want to go up to the 75th percentile from there. But what does this break down as a daily template. So I've used this template, man probably for going over six years now. There are deviations to it. But most clients, I'm going to have some form of a template where Monday, Wednesday, Friday, it's primarily lifting, this may be more strength develop if they're powerlifting, or competing in strongman, this may be more volume based or higher reps. Again, it's going to be customized to whatever they're doing. But Monday, Wednesday, Friday, primarily lifting of some form. Tuesday, Thursday, sometimes Saturday, more on the aerobic side, and we're gonna have break between the lifting sessions, right. So Monday to Wednesday, you're gonna have about 48 hours in between. So I find doing some aerobics stuff, Tuesday and Thursday works well. We can debate later about is there any possible interference of doing aerobics stuff after lifting? Probably not unless you're trying to get to a really high level. So if you're really cramped for time, and you can only lift or do exercise three days per week, I think you can do aerobics stuff after weight training, not ideally how I would set it up, but it can be done and getting it done is still going to provide a vast benefit over not doing it. So Tuesday, Thursday, workup and do some type of aerobic training. Again, those modalities I mentioned, can be running, biking, probably not swimming unless you're an elite swimmer, Versa climber and rower, and I'm missing one there but five exercises you can do primarily aerobic based, go move your body and heart rate for the exercise depends on the intensity you want to do. If your aerobic performance is real low, I would consider running an old school kind of aerobic base, you can look up some stuff from Dr. Phil Maffetone.



His recommendation is to take 180 minus your age. So the old carbonium formula is 220 minus your age for max heart rate. This is 180 minus your age. So if you are 40 years old, that'd be 180 minus 40. Your max heart rate for aerobic development, it's going to be around 140 beats per minute. Now again, is this ideal for everyone. Not necessarily but it's a good back of the envelope place to start. I also like having that be done with a nasal only breathing. So breathe in and out through your nose. A lot of times that will also cap your heart rate. Most people just need to get better at nasal breathing. Like you can check out some of their podcasts I've done here on that. Everything into like cranial structures. He talked with my buddy, Dr. Zach to the book, breathe or breath. But James nester, we've got a podcast on that too. So you go down the breathing rabbit hole on those, I also have another one on breathing here too. So old school

robic development, and just start wherever you can, like if you're really out of shape, maybe just do 10 minutes and then slowly, add more time. Eventually, you probably want to work up to two to three hours total time for aerobic development. And then I would run that for six to sometimes 12 or 15 weeks. I don't need to run it forever. But I do think having a dedicated period of time to doing that kind of lower or moderate intensity work. Some people will say this is zone two, if you go by heart rate zones. That's probably an okay start. But then at that point, you probably want to transition out of that and do a little bit more moderate to higher intensity work. To me, it seems like there's a trend now for people to do low to moderate intensity zone to all the time. And I've just found that at some point, you're not gonna see a huge payoff on that. Assuming you're relatively active, and you're getting out you're doing steps you're walking and you're moving around. If you have very, very little movement, then yeah, adding a lot of zone to work I think can be beneficial just from that. So let's say you've gone past the aerobic block and What do you do next. So with that, I would drop in some interval days. And this can be whatever type of intervals you want to do. I'll typically program then on like a Saturday. If it's a strongman competitor, this could be kind of like a medley or competition simulation, this could be repeated different types of intervals, there's a whole bunch you can do. The big point there is to make sure the quality of the intervals does not drop too much. Most people only equate interval work on how demolish they feel at the end. So you want some way if you're on a bike, you can measure speed. If you're on a rower, which sounds like this is a commercial for concept to rower, but you're gonna get average power out from the rower right away. So it gives you a way of measuring output. And a rough guide is I don't like people going much below 10% of their max, right, so if you did, let's say, a short row of 30 seconds, and your average output was 300 Watts, right, I don't want to see the next row be 150 watts or 200 Watts, right, so only about 10% off of that, that'll give you an idea of determining the rest periods. So those would be what's called complete rest. So do high quality work. And then repeat that high quality work.



And when you get to a point where you're just trying to maybe slowly go up and maintain, I like doing a robic work in the morning, that's away from weight training, so you're not gonna affect the quality of it. And if you do a daily or semi daily gain, if you have access to the equipment, or you're able to run outside, it's a little tricky to run out here in Minnesota. So I have a bike and a rower in my garage, I've found that you can get by with not a lot of work and high frequency works quite well. So one of the defaults I'll do is, if people are new to this, just start with getting on the rower doing nasal and nasal breathing, whatever the highest intensity you can do, and literally just start at one minute, then do that, you know, six days a week, in the morning, and then the next week, go up to two minutes. The next week, go up to three minutes. And the next week go up to four minutes. And at some point, you'll find where knees start to interfere with your other training or you just can't recover from it. And then that's going to be a spot where you're just going to kind of hold that amount. So for myself, like I'll get up in the morning and usually do six minutes on the rower, I don't usually do a warm up, I just kind of get up and do a little RPR and just do a cold. Because I'm looking more for just the cardiac work. I'm not necessarily using this as a max output. So an RPE, or rating of perceived exertion, like a six, seven or an eight, somewhere around there. And if you're doing it for time, you can then spec distance is a super easy way to track again, you could look at average wattage also. And I find that my minimum that once my row for six minutes, starts going below about 1500 meters, my aerobic system has really started to drop off. Now again, your mileage may vary, your points are going to be a little bit different. When you play with it, you'll find kind of a minimum performance that you want to keep. The nice part is that this sub max number you'll

have all the time, and you don't have to do a really horrible max test every week or every couple of weeks to see where you're at. If I'm feeling pretty good, like my rubbish system is recovering, I'm maybe pushing weight training a little bit more. six minute I'm in like the 1550 meter range, you know, maybe 1534 1544. And if I robic system is really good. I'm trying to maybe reduce some of my to k times I need to be in the closer to 1580s 1570s. Right now that's just for me what I found with playing with it over the years, but you'll find the time point, and then you can look at the distance you can recover. And again, this is an RPE of a seven or an eight. Most of the time I'll do that nasal breathing except for maybe the last minute. And I find doing that in the morning is a great way to wake up. I'll jump in do some cold water immersion usually after that, and then kind of start my day, take a walk, do whatever. So again, easy way to add in more aerobic training. And then on Tuesday, Thursdays, I'll do a little bit more. Six to 10 minutes on the rower and then maybe 20 minute easy zone to after it. So again, you don't need a ton of aerobic work once you've kind of reached the point where you're happy with it. But I find that if I go away on vacation, and I don't do any aerobic work for even a week, it tends to drop off relatively fast right You know, there's some stuff, some old Russian literature showing, you know, pure robic training and pure strength, you may have up to a two, three or four week, kind of what they call as Islams was like residual training effects. And I think that's kind of true where it won't a road to zero. But it will start dropping off relatively fast, but you get back in doing some aerobic stuff again, it will recover. So pick whatever modality you want. And check your recovery, you can look at heart rate variability and look at training volume, you can use rating of perceived exertion



to keep an eye that the goal is Dan John says the goal is to keep the goal, the goal. So if lifting is your main goal, you should see a transfer of aerobic work to lifting meaning you can recover faster from one set to the next, you can recover faster from one day to the next day. Right. So that's what I use as a marker. anaerobic training also generally will help heart rate variability, right. So heart rate variability, if you have a higher score, I tend to use the athlete system or the aura ring or both. The higher your heart rate variability is the more para sympathetic you are and that is a high association to your aerobic base level. So people I've seen with very low heart rate variability scores, we do a vo two max test. So one client in particular, her vo two Max was in the low 20% of just the population. And her HRV was pretty crappy. So we did more aerobic stuff for about six months. And her heart rate variability, at least on the i fleet scale, our baseline was now almost 12 points higher, it's a pretty significant shift. Now again, this is because a robotic system was so poorly developed. So that's today's podcast on the robotic rabbit hole, and do a vo two max test, kind of see where you're at, and then decide how to set up your training and template. From there. Again, you can reassess the VO to max again, depending on clients, I may not reassess for eight to 12 weeks, if I've got a nice sub Max indicator just depends on what their preference is. And so far after doing this for almost like four ish years now, I haven't really seen anyone who has not seen a substantial increase in their aerobic system, who has not reported that their day to day energy feels better. Even cognition feels much better. Working is easier recovering from one session to the next session is better, sometimes sleep improves, right. So I think there's a lot of transfer for it. Especially if your VO two Max is real low. I've also tested other people who don't classically do a lot of aerobic training, but they do a lot of high volume lifting a few of them their vo two Max has been really good. So just doing a robic training isn't always the best indicator, which is why I like having a test. So in that case, the one particular individual was the guy. We only had him do some light aerobics stuff Tuesday, Thursday, and it was pretty easy for just 20 minutes. That's all we did. And we just kept pushing his volume higher and higher. And he could

maintain a pretty high level of aerobic performance there. Again, his goal was mainly strength and body composition. So it wasn't really a need to push as a robust system even higher. So there you go. And if you want to learn more about how these all tied together, check out the physiologic flexibility certification will open again in early April, go to [Physiol. Let's see was it physiologic flexibility.com](#), I should probably get a better URL for that. And then you can get on to the whitelist. There. If you're listening to this and you're already on the newsletter, then you will have all the information that will come towards you there. In it we do cover changes in pH because as you do higher intensity work that will try to alter your pH, you talk a lot about the use of oxygen and co2, how that regulates breathing performance, different intermediates in this whole system such as lactate, which has been very misunderstood. And again, we make it very practical. So at the end of each intervention may give you specific action items to do. So if you are a person who just wants this for your own personal development, which has been about 40% of the people have taken the course then you'll know what to do. And if you are a trainer which has been about 60% of the people in the course, then you'll know exactly what to do with your clients. When do you program these things and better off Why do you program. So we're looking at an overall rational approach, instead of just hammering people into the dirt with intervals. And then four weeks later, the poor clients put out all this effort. And they've gotten better. But yeah, not as good as they thought, right. And there's probably a reason for that. So you'll be able to find that get on the waitlist. And we'll let you know once that is open.



Thank you so much for listening to this. I'll have some of the references below. I know this was a lot to cover in about 40 minutes here, but it's one of those things that I wish someone would have pulled me to the curb many years ago and explained to me it would have saved me a lot of pulling my hair out trying to figure out why some clients weren't responding. And then even trying to get them to do aerobics stuff without having an actual rationale of why they should, would have made my life a lot easier. So thank you so much. And if you have anyone who's interested in this, please send it to them. Hit the subscribe button because that always helps us out a lot. Any questions for me? You'll be able to find me on the newsletter. Just hit reply there. Thank you so much. Have a great day.