

# Hot and Cold

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## SPEAKERS

Dr. Mike T Nelson



Dr. Mike T Nelson 00:00

Hey, welcome back to the flex diet podcast. I'm your host, Dr. Mike T. Nelson. On this podcast, we talk about all things to increase your performance, add some muscle, and better body composition, all without destroying your health in the process. And today, we're sponsored by the physiologic flexibility cert that I've created. Our lesson today is going to deal with cold water immersion, and also heat via sauna. How do you set these up as a framework in order to make them useful. And those are two of the key components in the physiologic flexibility cert, which is all focused around ways to make you a more robust and anti fragile individual. So once you have gotten pretty good at nutrition, and training, your sleep is pretty decent, what are kind of the next advanced things that you would want to target to be more robust, anti fragile, and even help your long in jeopardy, quality of life. And this can be done by targeting things in your body called the homeostatic regulators. These are processes that your body has to hold constant, otherwise, you are dead. The main one is temperature, which is what we're going to talk about here today, body has to maintain about 98.6 degrees Fahrenheit, it's actually a little bit below that. However, we can go into warmer environments for periods of time, we can go into colder environments, because we have adaptation processes that allow us to deal with those temperature changes. Those processes kick in and order to try to hold our temperature as close to 98.6 as we can. So temperature is a homeostatic regulator in your physiology. The other ones briefly are your fuel systems. This is primarily blood glucose and the backup system of using ketones or Akita genic type of diet. The

other components are pH, your body has to hold pH very, very tight. However, you can do crazy things like getting on a concept to rower doing, I just had a client do this the other day, and she loved it. Three Minute test, me go as hard as you can for three minutes. It is really brutal, you spin off a lot of lactate plus hydrogen ions. Sometimes you may hear this called lactic acid and my little air quotes, but it's primarily lactate, which gets used as a fuel, and then these pesky hydrogen ions that make your muscles and everything burn. And it feels quite horrible. Your body can then buffer those so that your main pH doesn't drift too high or too low. You can also do different breathing techniques, everything from breath hold through kind of a Wim Hof style super ventilation method. So pH would be the second temperature the first fuel systems would be third. And number four would be oxygen and co2. These can be affected also by breathing techniques, exercise, and if you want to employ some fancy technology, maybe some other ways too. So all those things are covered in the physiologic flexibility cert, we break down the interventions, the theory, and what is the actual research on it, when should you consider doing cold water immersion, when should you not really do it? Same thing with heat. And the same for all the other interventions. And then at the end, we've got five specific action items for each one. So we tell you in order how to do them and where to actually start. This is put into a whole entire system that you can use with yourself or clients for your kind of semi customized journey through the homeostatic regulators to be more robust, anti fragile. And there's some very interesting data that to me, if you're really looking to maximize quality of life and longevity, this would be the direction that I would go. And that's based off of data in humans. It is a little bit limited, but to me that has much better data than a lot of the crazy stuff you see online. So go to [physiologic flexibility.com](https://physiologicflexibility.com) you'll be able to get on to the waitlist there and we will let you know the next time that it opens right now as of this recording. Probably be sometime in fall or early. Really winter will be the last time it'll be open for this year 2021. But it'll be open again next year also. So go to [physiologic flexibility](https://physiologicflexibility.com). COMM sign up to the waitlist there. As I mentioned, today's topic is a model for how to consider adaptations to both cold water and heat. So heat could be exercise in the heat. Or we'll use an example of a sauna just because it's a little bit more controlled. Now the sauna could be, you know, near infrared far infrared type version, or could be old school, just standard heat, they both kind of have their benefits. Based on the literature that I've seen, if I had a choice, I would go with just the standard sauna because the temperatures you can get are a little higher. Although some of the new far infrared type versions can get quite a bit warmer, the heat appears to be the main factor, at least that's what's mostly been researched. So as I said, temperature as a homeostatic regulator, but we can play with it in terms of getting warmer or getting colder. The mistake that I typically see people do is they get really excited about this. And then they start going both too extreme and trying to do both at the same time. To me, one, you don't need to be more extreme, you're not going to get a higher quality adaptation from it. And your risk also escalates. I was listening to a podcast from Joe Rogan the other day, and I

actually loved listening to his podcast, always really great stuff on there. But he was talking about how I think he did 20 minutes, and a cold water immersion. Just above freezing, he was complaining how he's like, I think I may have overdone it a little bit too much. And as the recording of the podcast he did right after its summer in Austin kind of there inside. And he still had like a sweater or sweatshirt or not. So you do not need to go that extreme, which he admitted was probably a little much. You're not really going to get any better adaptations from that to start. And your risk also escalates. It'd be like I've never really squatted before, let's just load 400 pounds on it and see what happens. Right? The good part is there isn't that much risk with cold exposure, but there is more risk. And then a lot of people get into doing contrast therapy right away, switching from hot to cold back and forth. Now if you're in a very controlled environment, let's say you're American football player in the NFL, and you've got people that oversee all your recovery aspects. Yeah, that might be useful. And for an advanced athlete with someone monitoring everything, it may be okay. But my bias is to pick which one you want to start with. Work on that first, and then put that on maintenance and work on the next one. The example I like using which I stole from the seem to lead author of the book anti fragile is the model of a barbell. Also because it fits well with everything else we're talking about. You can imagine a barbell, let's say you've got four or five on the bar. So you've got four plates on each end, there's a lot of mass on the left side, not much mass in the middle, because it's the bar and a lot of mass on the right hand side. This serves as a very good visual marker for what we're trying to do. So if we take an example that's different, and then I'll apply this to cold water and heat. You've got someone who, let's say, is a CrossFit type athlete, or someone who wants to add as much muscle as they can, but they still want to maximize cardiovascular performance to some degree for health and having the brain function all the other longevity aspects that come with it. We would want to increase the both of them. But we know that if we do both of them back to back and at a very high level, we'll have something called an interference effect. If you look at top marathon runners, they don't look like bodybuilders and power lifters. Right? They're going to be smaller in stature. They are going to be geared at using oxygen at a very high rate over you know a couple hours. If we look at say powerlifting or Olympic weightlifting, your goal is to lift a super heavyweight one time That's probably only gonna last a few seconds. So those are extreme adaptations on opposite ends of the spectrum. And if you are a marathon runner, you're probably not going to train like a power lifter, or power lifter, you're probably not going to train like a marathon runner. So we know at one point, there are very specific adaptations that you will get. Now again, those examples are on the extreme ends of the spectrum. And they're also for very advanced level athletes, it gets a little bit more messy when we look at stuff in the middle. So for example, if you look at the progression of CrossFit, I started falling CrossFit maybe was like 10 years ago, I've worked with a fair amount of CrossFit athletes have different capabilities up through regionals. And I'm still pretty surprised at the hybrid capacity of the top level CrossFit athletes now,

meaning that they have really good endurance, and they're pretty damn strong, both males and females. So I've been surprised at the levels that they can obtain, it's much higher than I would have guessed even from eight years ago. Now, if we pull any one of them out, and we compare them to a power lifter or Olympic weightlifter, they're not going to be as strong, or you compare them to an athlete that does only endurance events, whether it be biking or running, they're still not going to be as good. But as a combination of both of those, they're really good, which is the definition of the sport, of CrossFit. So I'm talking about the sport of CrossFit here competition at the CrossFit Games. So you can end up being very high, somewhere in the middle, such as a CrossFit athlete. So my point of all of this is that if you want to be really, really good, at one thing, there's going to be some trade offs, and your training is going to have to be specific. If you want to have a little bit more of a mix somewhere in the middle, you can still do that. However, I would argue that as you get better and better your training on a day by day basis, or even from one let's say week or month progression to the next will still only prioritize one main thing. This gets into the concept of like Russian block periodization and a bunch of other methods, we're not going to go too far down that rabbit hole. So I've worked with a couple CrossFit athletes in the past, who were pretty strong for where they needed to be at their competition. Granted, you can always be stronger, but their main number one limiter was their ability to do cardiovascular work. resting heart rate was a little bit of a higher side. So one guy in particular, pretty strong. resting heart rate was in the low 60s, which for an average population is really good for the athletes that he was going to be competing against, it was probably 15 points higher than some of those other athletes. When we did his vo two Max, it was okay, but not amazing. So it was definitely lower compared to the other athletes he was competing against. He did pretty good on the short mat cons. But when anything got to the 1015 or 20 minute range or longer ones, he was just really, really suffering. And that was because his aerobic system wasn't as developed as it needed to be. And so he had been working really hard, doing a lot of met cons, and not getting much better. So we put a strength on maintenance. He did mostly lower rep stuff, a little bit of volume. And then we worked really hard for several months on his aerobic capacity using the rower running different methods. And then we transitioned back, got him back into sort of metcon shape, which took about four to six weeks. And he did a lot better. Now that process was about nine months. But in order for him to bring up his weak point, we had to put the other things on maintenance, so he didn't get any weaker, he actually got a little bit stronger. But we've mainly worked on his aerobic levels, cardiovascular to get them up to where they needed to be. Were in the past, he kept kind of trying to work on both simultaneously. And you only have enough resources. And you're kind of pulling the body in two different directions at the same time that we go all the way back to our barbell model. Now, the barbell would be cardiovascular fitness or aerobic fitness on one end, sort of long duration and on the other end would be higher intensity, short duration, heavy loads. And you can transition back

and forth of those such as a CrossFit athlete. But if one is lower, you need to spend a dedicated amount of time to work on that. This gets you out of the interference effect. Now, again, this becomes only an issue as you become a higher level athlete. If your butt looks like a couch cushion, and you don't really run, you don't lift. Don't worry about any of that. Just do a little bit running, do some biking, do some rowing, I'm big fan of the rower because it's less impact, less risk of injury, lift some weights, just go move. And I'm not even worried about sequencing or anything. I think there probably are better ways to do it. But you're going to get the most benefit from just doing the thing. By far, no questions asked. After you've been doing it for quite a while, and you're at a higher level, then those things become more important. There's been a couple studies now looking at lifting. One study from a couple years ago in female athletes where they had a group lift, they did some more ballistic movements like vertical jump. And then they did 40 minutes of moderate intensity cardiovascular immediately after training. The other group did the exact same lifting program did not do any cardio after they didn't do any cardio period. What they saw was in the group that did the cardiovascular at a moderate level immediately after their weight training, markers, a speed and power such as vertical jump, were statistically significantly less. Now again, it wasn't a massive effect. But again, if you're a higher level athlete, it is something to pay attention to. And it's normally your speed and power metrics that get the biggest hit. And if you think about what's going on, those athletes were working quite a bit longer and putting in a lot more time to see a less benefit on speed and power. Because they were sandwich right back to back next to each other. There's been some other data that shows if you split them apart, you don't see as much of an interference effect. And again, this all depends upon what you're looking at, the farther away you get on the ends of the spectrum, the more you see a potential for an interference effect. So in this study, that's what they saw. So speed and power and the ability to do high amount of work over a very short period of time. That's kind of the far end of the spectrum. You contrast that and sandwich at next to moderate aerobic training, we see less speed and power. However, you could still probably do moderate aerobic training in the morning, which is my preference if you need someone who needs to work on that, and do their weight training, even speed and power later in the afternoon. That's typically how I would sequence it. If I have to sequence them on the same day. They go all the way back to hot and cold. Same idea. So we've got hot on say the right end of the barbell, and then we've got cold on the other end of the barbell. So they're going in two different directions. Granted, the parameter which is temperature is the same. So some of the molecular mechanisms that get up regulated like Heat Shock proteins are similar. But some of the other mechanisms are quite different. My bias is than to train the hot or heat end of the spectrum the first. Again, the assumption here is that you have equal access to a sauna, and you have equal access to coal. This would then change obviously, if you don't, so my case right now, I currently don't have a sauna. But I've got a 15.6 cubic inch freezer filled with water in my garage. So doing cold water

immersion is much easier for me to do to get access to a sauna, I have to go to the local gym. And all honesty, the sauna there just doesn't get real hot. So because of that, because I have a constraint in my environment. I actually started with cold. But if you've got equal access to both, I would actually start with heat. The main reason is that there is almost no interference effect that I've seen between heat and aerobic training and weight training. If anything, the mechanisms that are targeted with being an Asana may overlap with a Robic mechanisms. If you have a group that is untrained and you have them do sauna exposure, you actually see a slight uptick in cardiovascular or aerobic performance. Now again, that is for a group that is on Train. And you think about what happens when you're in a sauna, we have elevated heart rate, we're obviously trying to dissipate more heat, you have other changes that occur such as expansion of plasma volume, and things that result in an increase in aerobic performance. On a high level, I talked about this in the phys flex course. Because the underlying mechanisms are a little bit different with heat and aerobic adaptation, I think there may be an additive effect of doing both of them together, even if you're more advanced athletes. Again, I can't point to a randomized control trial that's really looked at that a couple of studies have kind of hinted at one study was very underpowered, though, but there's not much of a downside to adding it in. So I would look at adding hot or heat first, just because if anything, it may help the adaptations that you're trying to get, I have not seen any data showing that there is an interference effect, or that it may potentially harm the positive adaptations that you would see from both weight training or aerobic endurance based events. Cold However, if you do cold immediately, after training for hypertrophy, if you're into water of 50 degrees for at least 10 minutes or longer, there is about four to five studies now to show that it does blunt hypertrophy to some degree. Again, I go through all those studies and the caveats in the physiologic flexibility cert, so I'm not going to bore you to tears with all of them here. But there is a potential interference effect, they're so cold, if you're doing it at a time point outside or after that might be okay. If your goal is repeated performance, you probably don't care that if you're an in season athlete, and you've got to perform on Monday, and you've got another game Tuesday. Or, again, like the American football example, you've got training all week, and you've been beat up from having these other massive sides of beef with eyes running into at full speed, then yeah, if you feel better doing cold water immersion, then go for it. Right because your goal is a little bit different. So again, we always need to keep the context in mind. There's some data related to mitochondrial biogenesis that cold water immersion after a Robic training may benefit it. This is also related to different downstream molecular markers, PGC, one alpha etc. So cold water may help a Rubik performance if done immediately after. So again, going back to our barbell example, I would work on hot exposure first, because there is more potential benefit. Again, that may be just because we have more research on it. And there is less interference effect. So I would block a period of time, maybe six to eight weeks, and then I would work on sauna exposure, I would start at a very low temperature and a low time

point, I would get out before it gets really hard. And I would track temperature and time, right, because that's going to tell you your total dose, I would start quite low and maybe you know one to three times a week. Over time, you can play with increasing the total dose by increasing the frequency. So I did it for two days a week, I'm going to go to three days a week, then four, then five, then six, I can play with a little bit higher temperature, if I have control over temperature, sometimes at gym settings, you do not and I can play with time exposure also, all long, I'm in there. Once I'm pretty good on that, let's say eight weeks, then I would put that on maintenance. So maybe only a couple times a week. And then I would focus on cold exposure. So doing the same thing. So in my case, I've got cold water immersion in my garage gym, I usually start at around 50 degrees Fahrenheit, and just go for 30 to 60 seconds, build up time there, and then drop the temperature a little bit and kind of start over again. And again, and that is flexure that go through, you know exact protocol and everything that we use for that. But it's the same idea. You're just playing around with dosage. So my main focus would be more on cold for that period of time. I tend to go longer on cold exposure because I do think it takes longer to build that up. I'm not sure why that's just something I've noticed over the past two years from doing this mostly daily. So I would run that for maybe eight to 12 weeks or even longer. Once I've done that, then I would consider playing around With contrast therapy, right, so we've got adaptation to heat, adaptation to cold, and then switching back and forth. So contrast therapy of whatever form is going to be switching back and forth, I think that is going to be a little bit higher stressor to your system. That doesn't mean it's bad. And it is also much harder to quantify. What temperature for heat did you use? How long are you in the heat? What temperature for cold did you use? How long were you in the cold? How many cycles did you do? How much time is there in between the hot versus the cold, there's just a lot more variables to try to figure that out on your own. So that's the framework using the barbell as a model, we want to increase our adaptation to the right end of the barbell, increase our adaptations to the left end of the barbell, and then to be able to switch back and forth between them. You'll notice that this is the exact same framework I use in the flex diet certification, right? So metabolic flexibility, how well can you use say carbohydrates and is the right end of the spectrum. So let's work on that. Let's make sure you're really good at using carbohydrates, your blood glucose is nice and regulated, all that kind of stuff. And then let's keep that going. And then work on the other end of the barbell, the fat metabolism side of the barbell, it might do some fasting, maybe a ketogenic diet. Again, there's pros and cons to all of those, we want to upregulate our body's ability to use fat. Once we're pretty good at doing that, then you can worry about switching back and forth. The metabolic flexibility, how well can you use carbohydrates? How well can you use fat? And then how well can you switch back and forth between them. So it turns out that barbell framework works really, really well for a lot of physiologic systems. And in the physical x, that is the model we then use for each of the four homeostatic regulators, temperature, pH, fuels, and then oxygen and co2. So there you go.

That's a framework of how to incorporate cold and hot into your training to increase your physiologic flexibility to be more robust and anti fragile. And in my biased opinion, increase the quality of your life and your longevity. There's also another sort of hidden aspect in there that deals with your brain and overriding your limbic system. But I won't talk about that right now. So thank you so much for listening. If you want more information on the fifth flex certification, go to physiologic flexibility, calm, you'll be able to get on the waitlist, you'll be the first to notified when it opens. Again. Thank you so much for listening to this podcast. As always, really appreciate it. please hit subscribe on whatever podcast app you are using. That is kind of the main thing that determines where we rank. As always, comments are super appreciated, whatever stars you feel is appropriate. If you do leave a lower star, that's totally fine. Just give me some more details why that would be beneficial so we can make this a much better show. Thank you so much for listening greatly. Appreciate it. Talk to you next week.