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## WEEKLY MUSCLE BUILDING EXPERT *Interview Series*



### **Craig Keaton Interviews Mike T. Nelson**

CK: All right, we are here with Mike T. Nelson from [ExtremeHumanPerformance.com](http://ExtremeHumanPerformance.com). My name is Craig Keaton. I am the founder and the owner of the Movement Dallas. You can check this out at [TheMovementDallas.com](http://TheMovementDallas.com). We are here with Mike today to pick his brain, his incredibly large brain, about metabolic flexibility. I'm excited to kind of jump into the decades of research and education that Mike has, and really explore this topic that he's kind of been bringing out to all of us athletes and to all of us who are seeking fat loss and lean muscle gains, et cetera. I'm excited to kind of hear more about his ideas and how he's implementing that and just kind of go from there.

So, Mike, if you can give us a little introduction, that would be great.

MN: Yeah. Thank you very much for that Craig. I really appreciate it. I was on one of the other calls here with Mike a while back. So, you may have heard me yammering

then. But, if you missed that part, the only reason I give a little bit more of a detailed background is not so much that I like to hear myself talk that much, but I just think it's always beneficial when I go to see speakers. I always like to know more of their background so I can get an idea of how they view things. And knowing how they view things I think is beneficial to sort of the pluses and also the limitations of their background, too. It helps the end-user figure out how they got there.

So, I did a Bachelor of Arts in Natural Science, minor in Chemistry from St. Scholastica in Duluth, Minnesota. It seems like eons ago. I started in 1992, then decided I was going to go to school for engineering. So, I did two years of post graduate work in mechanic engineering, actually up at Michigan Tech in the UP of Michigan, that piece of land up by Wisconsin that's not really Canada, that people forget about. And then I decided, while I'm here, I'll finish and do a Masters. So, I ended up doing a Masters in Mechanical Engineering from there.

My course work was primarily in biomechanics. So, I did more of the...it's called solid mechanics. It was more of the advanced study of how crap breaks. And then, my research area is actually more on biomedical engineering, looking at heating of different types of tissue by microwave, such as...sponsored by the Air Force. It was very interesting.

So, after I did that, it was 7 ½ years full time. I swore up and down I was never going back to school. I was completely burnt-out and I never wanted to look at a book or anything else again. That lasted about a year and a half. I started taking classes part time.

The company I was working for at the time, they were like, oh, if you want to take a few classes, we'll help pay for it. And I'm like, "Oh, cool!" So, I started taking more philology classes and eventually enrolled in the PhD program in biomedical engineering at the University of Minnesota. I got almost all the way through that, only had two classes left, hadn't done any research yet, though. I realized I spent all my free time studying exercise physiology, went to exercise physiology conferences for vacation, annoyed the crap out of people there, and decided, well, I might as well change.

So, I started all over again with class work in the kinesiology department and right now, I'm just finishing up my dissertation in the Exercise Science department. So, for my dissertation topic, I'm looking at heart rate variability and my main over-arching goal is looking at metabolic flexibility. So, I did a human subjects trial using energy drinks. Which actually, I'm just in the process of writing that up today, as we speak. So, that's kind of where I'm at. I own Extreme Human Performance, train people here in White Bear Lake and all sorts of fun stuff.

So, a little bit of a long intro, but the take-aways from that is that I did a background in engineering, which is a little bit different from most people in physiology. Not that it's better or worse or any different. So, I tend to look at things, I guess, a little bit different. Because, physiology is very complex and I often joke that it's associated with sort of every bad engineering word. It's nonlinear, antistrophic, all this other stuff that if you were to take math or physics to try and describe, it's really difficult. But, that doesn't necessarily mean that what you have to do at the end of the day is necessarily difficult. So, I think that, ironically, should be rather simple. So, I try to explain stuff in sort of simple text that people can understand.

CK: Absolutely. I think that's great. One of the things I'd love for you to share with us, too, is the fact that for any of us out there that have spent time in the collegiate realm, my background's in biochemistry and exercise physiology. So, I've had semesters and semesters and semesters with a lot of people that, you know, really don't kind of practice what they preach. They're not up and living it. I find that interesting that they're trying to describe this understanding of physiology without ever actually kind of endeavoring into it themselves.

So, I'd love to hear a little bit more about your athletic background as well, because there's people that know out there that you're more than just a walking Wikipedia, but a power lifter competitor, a sand volleyball player, all kinds of cool stuff. If you could tell us a little bit more about that, that'd be great.

MN: The quick background on that is that I was the most un-athletic kid known to man. I think when I graduated high school I was the same then as now, so 6'3", weighed like a whole 156 pounds. So, I went to college and I'm like, oh, I'm going to start training. So, like all guys, I got to the gym, just do bench press and arm curls and I don't know what the heck I'm doing. I could never understand necessarily why I was just horrible at sports. I figured I was just one of those people that just got the short end of the stick and that's kind of the way it was.

So, fast-forward through a whole bunch of injuries. I've done all sorts of fun stuff to myself. I also like kiteboarding, snowboarding, water skiing, all that kind of stuff. So, I managed to, in the mean time, pull both hip flexors, strain hamstring, blow-out my right ankle, strained wrist, ripped out right shoulder completely, separated left shoulder. So, you add all this on top of what I found out later is, that I actually had some visual issues. I actually am what's called stereoblind, meaning that I can see normal in acuity-wise, I can see things. So, if you give me an eye chart, I can tell you what letters are on it, but my eyes actually don't work together. So, in essence, it's a little bit even worse than trying to walk around with one eye closed. So, we've got two eyes that are designed to see in three dimensions. And so, I'm currently working through some of that stuff.

So, that's where I threw a few years. I did a bunch of work through Z-Health, I've done RKC. I've done CSCS through the NSCA. Over the time, I've actually realized that...if you're un-athletic, that's actually not normal. There will be better athletes and worse athletes, but if you're really un-athletic, there's something else going on.

And in my case, it was a combination of...I had a surgery when I was 4 ½. So, I've had my sternum cracked-open and stuff. A combination of all the injuries and plus, some of the visual issues.

So, now, ironically, compared to other people my age, I actually do pretty good. One of the highest compliments I've ever had is I was working with a friend who I've known for about four years, and we were trying to have her do some athletic stuff and she's like, "Oh, I've just never been an athletic jock, like you." I kind of laughed and I went, "Really?" She's like, "Oh, you're very athletic." And I'm like, "Wow!" I mean, compared to what I was, I guess I am.

So, my whole thing is that it's just...as long as each person is getting better, I think that's all that really matters. I'm not under any delusion that I'm going to win any power lifting event any time soon or even place very high. But, as long as I do better than what I did before, then I'm happy with that.

I did a grip competition here a couple of weeks ago. I had never done any of the events in it before I was in one of them. So, I figured, the only way I'm going to get better is to try, right?

CK: Absolutely. And I love that, and I love the fact that...I feel like you're encouraging a lot of the guys out here that they get on different websites and they're reading all the top guys in the industry and these guys are throwing up huge numbers. And the competition is not with them, it's with yourself. So, I love the fact that you're there to encourage all this. Go, "Hey, I don't care if you squat 400 or 1,000, we just want to see you, yourself, get better." So, that's very cool.

MN: Oh, yeah, because you're either getting better or worse. If you don't do anything, just the whole aging process means you're getting worse.

CK: Yeah, for sure. Well, I'll tell you what, that, I think, is kind of a good little prelude into the topic of metabolic flexibility, as one of the things that, Mike, you'll talk about for enhancing our metabolic flexibility, is exercise and making sure we're using our body. For everybody out there that has never heard of this concept of metabolic flexibility, I'd love to just get a general overview of what we're talking about today.

MN: Yeah. It seems like every time I explain it, I probably explain it a little bit different. But, in essence, I think...and especially in physiology, people forget that the body is

designed to adapt. Our friend said that adaptation doesn't really have an off switch. So, we can't really stop adaptation, but I think the faster we can adapt, that's probably better.

So, you can think of metabolic flexibility as being able to adapt to different things metabolically in terms of how you can use and process food, which the primary energy source for that are fats and carbohydrates. So, the example I use is if you have someone who's a diabetic, we know that it's been shown through literature time and time again that diabetics are a group of people who have a very hard time processing carbohydrates as a fuel source. That causes all sorts of other issues, health issues, that kind of thing. So, they are very metabolically inflexible to carbohydrates. Unfortunately, there's other groups of people, it's a little more rare, have a hard time with the dietary fats. So, they are very metabolically inflexible to dietary fats.

If we go to the other end of the spectrum, we look at someone who's very healthy, works out and we look at their ability to use carbohydrates a fuel source, and they can use them efficiently, then they're very metabolically flexible. Ideally, they should be able to use fats also.

So, in a perfect world, you would want to use fats at the right time during exercise and then carbohydrates at the right time during exercise. So, more lower intensity work, in general, is going to be more burning of fats for energy. And then, as you shift into higher intensity exercise, you go do some sprints or whatever, you want to be able to then use carbohydrates, because it allows you to get a greater performance increase.

And believe it or not, there actually are people that really can't switch very well between one or the other. It seems kind of wacky. I never really thought that it could get sort of pushed that far out of line. But, it does happen.

So, you basically want to be able to use anything, really, for fuel without many side effects. Now, if you take that to a sort of logical conclusion, you can come up with all sorts of things. I just think the whole premise is that if you have someone, a new client, they come in and I go, "Hey, you're going to have to...you're sitting on the couch a little bit too long. I can still see you've got cheese doodle dust on your fingers. You're going to have to eat broccoli and chicken the rest of your life." And they go, "Ahh!" And then they run, screaming out the door and you never see them again.

Now, the reality is, they probably have to make some dietary changes and some exercise changes. But, their whole goal, long term, once they get to their goal or even on the way, it's not to see how hardcore you can be. It's based on results.

Now, some people may need to be 60% compliant, maybe 90% compliant. But, the whole thing is to see that how much can you really sort of get away with? I think

everybody secretly wants to be the guy or gal that can kind of eat whatever they want and they don't really have to worry about much of anything. They still look good and they perform well.

From what we know of physiology is that that should be pretty possible. It will vary a little bit for every person, obviously. But, the goal is to see how much can you actually get away with, not how hardcore and strict about everything do you have to be.

CK: Sure. I think that's kind of one of the bright points of this concept that you're teaching, is the fact that I have personally worked with a lot of people in the performance realm, so a lot of athletes, from Olympic to professional, collegiate and high school, to all different ranks. I've also worked with fitness competitors and figure athletes and even my wife comes from the school of fitness competition and figure athletics. But, I say that because one of the things I often find is that they're sold on this idea that their life is ultimately going to be dictated by how strict they can be.

And ultimately, it becomes a bad thing for them because there seems to be a need for balance of all things. So, it's interesting, you see people who do great 90% of the time, then all of a sudden that 10%, it's hardcore. Then, they start to develop all kinds of complexes and everything else that kind of revolve around that.

So, it's kind of the idea almost of the fact that it's like, if you hate your health program, I can guarantee you're not healthy. It's the fact that these guys are so upset by what they have to do to what they think they need to do in order to be good. It's actually detrimental.

And so, I say all that because I think one of the really interesting things that you offer to us on your webinar, which is a great resource for people to get out there and check out some new information and I think get a better understanding of how this concept kind of originated and just how practical the thinking is behind it. And then, some good applications for kind of moving forward.

But, in there, I'd love for you to talk about this, because I love this study. I'd love you to talk to us about the rat study. Because, I really think it is a defining characteristic of what health really means. And the problem is, I think so many of these programs kind of go against that. I'd love for you to talk about that.

MN: Yeah, I actually first heard this one from Dr. Cobb from Z-Health. So, the researchers were doing a rat study and the cool thing about rat studies is they're really easy to control. I mean, I've done human subjects trials and went great, all the people I had were completely awesome and made the study entirely possible. But, in general, working with humans is much harder than working with rats.

So, you've got a cage on the left and a cage on the right. You put a rat in each one and they put a little exercise wheel in each one. And what the researchers wanted to know, which is actually a very good question, is if we overfeed the rats, will they sort of spontaneously exercise more? Will it sort of trigger some type of regulation in their body that they'll just start exercising more. They don't really gain weight because they'll be burning off those calories.

So, in the cage with the wheel on the left, they said, "All right, Mr. Rat, you can get on the wheel whenever you want, not restricted. The wheel is free to move. You can hop on, exercise as much as your heart desires." They keep track of how much the rat exercises.

The wheel on the right, they say, "Well, since we're comparing it, we really want to control how much exercise this little rat can do. So, every day at three o'clock we're going to turn the wheel on." I think it was like 45 minutes. So, we're really going to control how much exercise the rat can do, as a comparison.

So, what they found in the study was kind of interesting that the rat in the cage on the right where the researcher turned it on for a fixed period of time every day, exercise for the first couple of days and then it just refused to exercise at all. The rat actually got fat and died early.

So, the researchers are going, "Whoa! Wait a minute! What the heck is this?" And their theory is that...if you've worked with enough humans it would make sense, that the rat in the cage basically lost all control over everything. He no longer could decide how much exercise he could do. If you're a rat in a cage, you don't have a lot of choices anyway.

The theory is that since he lost control of how much he could exercise and sort of gave up control in general, that he just said, "F you. I'm going to show you. I'm just going to get fat and die early. I'm not going to do anything you tell me to do."

It's funny, because if you... There's always a few clients that are real hardcore, so whatever you want. "Hey, Donny, go run into that brick wall." "Yep, right away chief." And away they go.

But, most people, it's amazing that the more strict and the more I say, "Okay, it has to be done exactly this way," the more they'll amazingly enough pay you a large sum of money and show up and really not do anything you told them to do.

CK: Oh, yeah.

MN: And anyone who's worked with clients will go, "Yeah, that's totally true." And so, I actually sit down and tell clients this little story and I'm like, here's the deal. The more

you actually do, the more I will then give you to do. So, for some people who've never exercised, it may be do one pushup on Monday, I your home. One pushup? Yep. Well, I want to do more. Well, you do that and then tomorrow you do two then.

They look at you like you're just a two-headed space alien. They go, well, this doesn't make any sense. The reality is, one, I want to start at zero, because I don't know what their tolerance is. I have no idea. If I start somewhere in the middle, either I have to go up or down. If I start at the bottom I know I only have to go up.

And then, it's just basically getting their confidence that you're still allowing them some control, and the more they do, the more they're in essence sort of rewarded with more to do. Instead of giving them this huge complicated plan and going, "All right, you're eating chicken and broccoli the rest of your life and that's the way it's going to be and we're starting Monday and it's going to suck. But, you pay me, and that's what happens." They just completely freak-out and don't do anything.

CK: Sure, yeah. I love that. That's the really interesting thing. We'll get into this, I think, at some point when we start talking about the applications of how to make ourselves more metabolically flexible, as you put it. But, one of the things that I just love is the whole George Costanza idea. Everybody can hold-off. We'll talk more about Seinfeld in a minute, but it's actually such a brilliant idea because the scientific model shows that results are first and beliefs are second. And so, we have this... Unfortunately, we're trying to fit in this belief that now you've got to get your clients in all this stuff and going as crazy as possible. The problem is, it's not working. Take a look around.

MN: Bunch of fat people.

CK: Absolutely. Well, cool. So, I guess... So, we have this idea of metabolic flexibility that we want to be able to kind of... I think one of the things you were kind of pushing us towards is being able to move in and out of utilization of carbohydrates and utilization of fats as an energy source.

Can you go more in depth on the crossover effect? I think this is probably a big...kind of a big key point that helps people to understand the idea of metabolic flexibility more.

MN: Yeah, definitely. I mean, this effect has been known about for quite a while. I can't remember if it was George Brooks that initially came up with it. He's done a lot of research on it. And what it states is that as the intensity of exercise increases, in a healthy person, your body will shift more from utilization of fats for fuel to utilization of more carbohydrates for fuel. And at some point, there's what they call a crossover, where you're now going from burning more fats to burning more carbohydrates.



This can be measured in the lab by a little fancy machine you see where you kind of breathe into this thing. It goes into a tube that goes into a machine. It's called a metabolic cart. On the newer ones, what it will do is for each breath that you blow into the machine, in essence, it will analyze it and say, you're burning this percentage of fats and this percentage of carbohydrates.

So, when they do studies they can...it's an easy way to quantify what type of fuel you're using. And you can complicate the matter by feeding people different things maybe beforehand, more fat or more carbohydrates. In general, under relatively lower exercise, the body will tend to burn whatever it's been fed. Now, that's not exactly true all the way across the board under every intensity. The literature is kind of mixed on that. But, in general, if you had someone come into the lab and they'd been doing a very low carbohydrate diet, so mostly protein and a lot of fat, they will show that their body is then burning more fats. If you've got someone who's more of your standard cardio-bunny that eats mostly carbohydrates, they come into the lab and they will, under the same conditions, the same intensity of exercise, they'll actually register that they're burning more carbohydrates. And that makes sense, right? Your body in general is going to burn what's available in a healthy person.

CK: Sure, very interesting. I think this is a very important point for the performance minded out there, especially the endurance athletes. And I have several that I work with in this realm, from the marathoners to even the iron guys. Talk to us about the idea that... It's interesting you bring up the idea of the cardio-bunny. It's almost nonsense to me as to how we even came up with this idea of super high carbohydrate feeding when we know the way that the body would like to tend to utilize fuel in different endeavors. So, could you go into it a little bit further what might actually be potentially very beneficial for the endurance or performance minded person?

MN: Oh, sure. I think a lot of the... When you look back in the literature, for example, it literally took years and years of multiple studies and a consensus in the literature to show that under long duration exercise, if you take in some form of carbohydrate, a sports drink or something like that, you will actually prolong your ability to exercise. It's been show multiple times.

The theory is that the amount of glucose your body has stored, which is a stored form of cell glycogen, stored in the muscle and stored in the liver. That amount is actually limited, meaning that, depending on your intensity and that kind of stuff, the average person, you're looking at maybe two, two-and-a-half, maybe three-ish hours of pretty good exercise intensity before all your carbohydrate stores are actually burned-up.

So, the theory goes that, assuming you're not drinking anything. You're just drinking water. So they go well, if we ingest carbohydrates, then we can have another source of carbohydrates during exercise and we can therefore prolong exercise. That actually has been shown to be true.

The downside is that if you work with a lot of endurance athletes, if you take-in a low of carbohydrates during exercise, there's not a lot of blood flow in general going to your gut. Your body will want to redirect blood flow to the muscles because they're working. This is actually based on a concept of metabolic, I think, efficiency.

The point is that at some point, if you take in enough carbs that are not perfectly timed, you'll get visited by what they call the GI Distress Monster. You're not going to feel very good. You're going to get nausea and all sorts of other stuff.

It was funny, when I actually saw a guy speak in Florida this past June, I'm sitting there looking at the presentation, I'm going, "Holy crap! That's the same thing I do." Just a slightly different name.

So, what he does is if we look at it and we go, okay, the body has an almost unlimited amount of fat stores, even in a relatively lean person. You've got tons of energy that can be derived from fat. So, if we can shift the body to using more fats for energy, we don't really need that much carbohydrate to come in via beverages or that type of thing. Therefore, we also decrease the chance of being visited by the GI Distress Monster.

Oddly enough, he did the same thing that I was doing, which is kind of crazy to see, that he took guys and women and basically pulled carbohydrates out of their diet. Which, to a person who does a lot of cardio or aerobic training, it's like oh, my gosh. You're a crazy man. Just increase their fats, increase their protein a bit. He actually, at the same time, decreased their training intensity. So, he had them do a little bit longer runs at a little bit lower intensity.

So, in essence, what he's doing, which I agree with, is teaching the body to burn more body fat. By taking out carbohydrates so there's not many carbohydrates around to be burned, there's more fat to be burned and I've also reduced the intensity of exercise. So, if you go back to the crossover effect, at lower intensities, in general, of exercise, we will burn more fats during that time.

What he found was that within a short period of time, actually, in some people, three to four weeks, their performance dramatically increased and the amount of carbohydrates they needed to take-in during exercise was much less and they also lost more weight, because they're literally burning more body fat than what they were before.

So, it's kind of sort of almost the opposite of what you would think. By teaching the body to burn fat as its primary fuel source, it actually becomes more efficient. Again, these are primarily for people that are doing longer endurance events. So, the longer the endurance event, the more that if you can shift to burning fats, it will be more beneficial, it's a lower intensity.

CK: Sure. So, we're talking in the two, three hour or three plus hours?

MN: Yeah.

CK: So, an interesting point that I'm hearing, I think, from this idea is when we look at...one of the things that I wish we could even had a whole other conversation or interview based on just exercise and how we utilize that to form metabolic flexibility and just improvement across the board. Whether it's performance or aesthetics, but it seems to me, though, given this idea and understanding of metabolic flexibility, that these exercise sessions that almost have us working more so within our limits, that we're not just maximum, just killer stuff, that it's not so much that the body composition changes aren't coming from necessarily from the quantity of fat utilized in that exercise session. But, actually, the quality that we are giving to the body that now it's able to...it's learning to be more flexible with its energy sources. Would you say that's accurate?

MN: Yeah. I mean, obviously the amount of exercise you do is always...it's going to matter. It's always quality and quantity. So, we're not saying that you do one quality pushup and whew body! Your spare tire goes away. But, in a perfect world, if you go to strength training athletes... And I've always wondered this and I've got I don't know how many literatures on it. In a perfect world, you would actually want the body for all this extraneous energy.

So, if we look at building muscle, right? Building muscle, although it's been argued back and forth, is probably a pretty metabolically taxing event. It's going to take some energy. How much energy is pretty debatable. In a perfect world, we would want to pull that energy, actually, from fat stores so we could simultaneously increase muscle and decrease fat at the same time.

Unfortunately, the physiology is kind of messy and it doesn't work exactly that way. But, I think to your point, that if we can try to shift the body more in that direction, then I think it will be beneficial so that you may not need as many calories as what you think you do if you can try to get the body to pull more body fat stores as its caloric need goes up. Excluding drugs, it's pretty hard to do that exclusively. But, I think if we can kind of push it more in that direction, it would be beneficial.

CK: I think that's directly to my point is, I think what we're saying now is to add more lean tissue or to truly ramp-up fat loss or performance, it's not so much that we've got to go so much harder, we have to do it better. Doing better, it becomes so much more effective that we almost don't know at this point how easy it could be to get ripped, is what it sounds like.

MN: Yeah. And it's because if you... The example I always use is a guy that's going to the gym that's doing a max deadlift. A deadlift, a good exercise, burns a lot of calories, compound exercise, full-body movement, can use a fair amount of weight. All of those are good things. He's doing a one-rep max and you're watching it and oh boy, it's just looking pretty horrible. His face is already crinkled up like a prune and the weight is two inches off the floor. You're ducking down behind him because you're afraid you've going to get hit by one of his discs that come flying out of his back to the other side of the gym. He gets to about mid thigh and you see him heave back and hitches it. Oh, but he makes it; drops the weight. I can guarantee, hopefully, he's probably not going to do another rep. His quality was so bad that it actually limited his quantity.

An extreme example is, if you can deadlift 400 and you only put 135 or even 225 on the bar, you can probably do a fair amount of reps. So, you can probably get in a fair amount of volume of work by doing that. And I think, back to your point, is that people who often go to the gym, looking to find their limit, and when they find it, it pretty much impedes their ability to do any more quantity of exercise. So, quality and quantity are more highly related than I think we initially want to believe.

CK: Yeah, and I think it speaks to the original point that you talked about, is that we are adaptation machines. And so, there's no off switch to adaptation if we're teaching ourselves that something is impossible, then it's impossible. So, yeah, why would our body let us get better at something that just sucks so bad?

MN: Oh, yeah, and plus, potential risk of injury and all that kind of stuff. I mean, if you believe the body is made for survival, which I would agree with, and not necessarily performance, you, at all cost, want to make sure you survive.

So, if you're doing a heavy deadlift and you think you're going to injure your leg and that may impair your ability to get food....not so much in the US. But, in general, it's probably not going to let you do the lift. If you try to override that, yeah, you may make it, but man, the cost of doing that, I think, is going to be really high.

CK: Yeah. I totally, totally agree and that's definitely what I think more of us are seeing every day, just with the application of all this great information. I think one thing that I'd like to go into just a little bit more for any of the science dorks out there like us, that like to talk about all kinds of technical stuff. I know we were talking about keeping it

easy and getting easy bit of information. But, I'm sure you can still do this in the context of the subject. But, I wanted you to briefly talk about...not only are we talking about the back and forth of fat and carbohydrates, but even maybe a greater kind of physiological idea or marker in talking about the shifts between the parasympathetic and sympathetic side, kind of autonomic tone and talk to us about some of the neural implications with this as well.

MN: Oh, yeah. I did a lot of Z-Health study and I've always been interested in the nervous system, because that, in essence, is sort of the governing system of the body. And just from a perspective of both performance and that type of thing. I mentioned earlier that I've done a fair amount of research on heart rate variability. And my heart rate variability is, it's a way to measure your relationship between parasympathetic and the sympathetic system. This is of the autonomic nervous system.

You can think of the parasympathetic as the rest and digest branch of the nervous system. So, it's more like the brakes on your car. And the sympathetic is the fight or flight system. And that's more like the accelerator on your car. So, for example, this is primarily thought of in terms of innervation of the heart, but it applies to all systems in the body.

If you were to take a heart out, and they've actually done these studies. If you go to, I think it's VisibleHeart.com. It's sponsored by MedTronic. And so, they've actually taken human hearts that were not suitable for transplants... This was done at the University of Minnesota here. And actually put them on sort of a permanent bypass and literally re-animated them, started them up again.

This is been known for a while, that if you pull a heart out, in essence, without any innervation from the body, it will actually beat on its own at a rate of about 100 beats a minute, roughly. So, in general, the body is always under, at rest, more parasympathetic, in essence, stimulation. The parasympathetic stimulation is actually decreasing heart rate. That makes sense, right? Most peoples' resting heart rate is 50, 60, 70, somewhere around there, definitely below 100.

So, when we exercise, the first thing that happens, primarily, is actually the withdraw of parasympathetic stimulation. So, it would be like if you're driving your car around and you've got some pressure on the brake and some pressure on the accelerator, and to go faster, instead of jamming down on the accelerator, you actually start to remove the brakes first. That kind of makes more sense. I talked about heart rate variability, that's actually one way to determine the ratio of parasympathetic to sympathetic.

So, if we go all the way back to the crossover effect, which we had talked about, as you start to exercise, and as the intensity of exercise increases, now you're doing

some sprints and you're running faster and faster, that's actually increasing sympathetic stimulation.

And in the body, what happens then is that pushes the body more towards carbohydrate usage. So, the fuel then should be matched to the exercise. So, higher intensity exercise, because of sympathetic stimulation and a few other things, pushes the body to use carbohydrates.

The two main drivers are primarily from a nervous system standpoint, parasympathetic versus sympathetic, from more if you go into the hormonal system. There's a whole bunch of hormones, but the primary one is insulin.

The guy I work with here, Dr. George Biltz, he sort of refers to the nervous system control is kind of more like the wire control. So, if you've got your laptop and you've got to plug it in, you don't have a wireless connection. That would be more like the nervous system. The hormonal system is more like your wireless communication. Hormones are normally excreted from a gland or somewhere in the body, travel around via the blood stream to whatever their target is. So, insulin, as it's primarily increased, will actually push the body more towards carbohydrate usage and more higher intensity exercise.

The reverse is true if you have very low levels of insulin. For example, an extreme would be fasting, so no food coming in at all. Your insulin levels are going to be very low and you'll primarily be burning more body fat at that point.

CK: So, it sounds like, at this point, obviously we understand the correlation that comes with lean muscle gains and fat decreases in our body. We understand how all the different markers of health that are changed because of that, but now it sounds like we have a greater explanation as to the different directions as to why those are associated with greater health. That's really interesting to see really how profound the effects are of such a simple program.

I think now is a great time to...if you want, to give us some nuggets, to give us some ideas on... So, we understand, we agree with this concept. So, Mike, what do we do now?

MN: The main one that primarily controls it, as we talked about before, is exercise. You could have a whole hour upon hour discussion just on the effects of exercise. But, if we take, for example, our diabetic friend and they go do a hard exercise session that most of the time what we'll see is if we measured their body's ability to use glucose after exercise, it's much better. There's actually some type II diabetics that after exercise have normal glucose metabolism.

So, we know that biomechanically, you're moving around, exercising the muscle, due to translocation and yak, yak, yak, all this other stuff, it enhance the body's ability to use glucose. If you don't exercise a lot, obviously exercise is probably the fastest way to normalize your body.

I mean, if we could create a cure for all sorts of things, it would probably be exercise. Exercise works to normalize a ton of stuff in the body.

So, the key is, as you had talked about before, is more exercise within your limits. Most people, again, are going probably too intense, and again, like we talked about, their quality is suffering, therefore interfering with their quantity of exercise.

When I had talked about Bob and that he'd worked with a lot of endurance athletes, the interesting part is that he actually cut down on the intensity of exercise that they were doing. When he talked about the nervous system, that's actually pushing the body to be more parasympathetic dominant. These people were probably highly sympathetic dominant. I don't have any data to show that yet, but high carbohydrate usage, higher intensity exercise, probably going a little bit too extreme, right?

The sympathetic nervous system, on the high end, is fight or flight. It's pretty 'run for your life'. That's designed to happen over very short periods of time. Save the stress conversation for another day.

But, if you look in the wild, I know Robert Sopolsky has done a lot really cool research in that area. If you're a lion and you're looking to chase a zebra, let's pretend we're the zebra. You see the lion and you're going to basically run like Hell. It's probably not going to be for real long. It can be pretty fast and you'll either make it or you don't and you don't have anything to worry about at that point. But, you're not going to go out and probably run at a high intensity for a really long period of time.

Anyway, exercise and that's all debatable, what's better, high intensity exercise, low intensity. In general, if people aren't doing anything, I like having them do some weight training initially. One, because that's going to activate a fair amount of muscle mass, it's going to increase resting metabolic rate through lean body mass, and once they're doing that for about three to four sessions a week, if they want to add some more high intensity stuff after that, that's fine.

In general, it seems to be about five hours per week of exercise, seems to be ideal. If you even get someone to go from three hours to five hours, there seems to be a quite noticeable difference. That's probably because most people aren't really that active. Unfortunately, sit a lot at work, come home, even if you exercise half an hour at night, it's still not that much considering what you normally do. So, that's one way.

CK: Very cool. I think one thing I want to add to this whole deal is, number one, all the listeners out there, this is great, because I think with time constraints of most lectures I might give, unfortunately you can't go into great detail as to how to exercise to be most effective. So, this is great information. I think this is the first time that I've heard you be able to go a little more in depth and into how to exercise to really ramp-up the effects. So, I think this is great.

I would love maybe if you've got some resources that we could plug-in real quick here to help people start exercising better. I think one of the misconceptions that a lot of people have is going, "They want me to do curls with pink, five-pound dumbbells. They want me to walk on the treadmill." No! That's not what we're talking about. We're not saying don't go work hard. We're trying to get you to work better.

So, if there are some different resources that we could give to let people go a little bit further, because I agree with you Mike, and I think exercise really is so profound in its influence over our metabolic capacities and flexibility. I think this is such an important point for people to understand. So, if there are some different areas where you could direct them to learn more about that, that would be great.

MN: Yeah. Basically this is as a shameless plug as it sounds. I should probably plug my website, which is ExtremeHumanPerformance.com. You could probably look up my YouTube channel. You can just go to...search for Mike T. Nelson and you can find it. I know Craig's got a bunch of information on his website, too.

CK: Cool. So, we've got exercise as one of our potential applications or interventions to creating more metabolic flexibility. What other ideas do you have for us, Mike?

MN: Yeah. The other one is that for most people, they're probably going to have to decrease the amount of carbohydrates they take in. If you want the body to burn more fats, especially initially, then one of the easiest ways is to have more fats coming in. Some people get really tied up in the effects of insulin and all that kind of stuff. In general, carbohydrates will secrete more insulin and that's by design. Because, remember that if you were to pick one hormone that's probably the fuel selector switch, it's insulin.

So, as insulin levels are high, your body is going to want to use and also store more carbohydrates. So, fats and proteins, in general, have a lower insulin response. It's a little more complicated then...I won't go into that. But, insulin's not as big of a deal as people make it out to be. The simplest thing is that if you want to burn more fat, having more fat coming in is going to be a good idea. And in order to keep your calories down, because no matter what anybody tells you, calories do actually matter. Thermodynamics is still actually true. You will have to probably decrease carbohydrates.



Protein, in general, you can set at about one gram per pound of body weight. That's actually on the higher end of the spectrum. You can probably get by with less of that, even if you're reducing your overall calories, too. But, that just makes for easy mass then, too. So, that also would help.

CK: Oh, wow. Okay, cool. I think that's such a great point that people sometimes just really struggle to hear. But, if you want to use fat, you've got to consume fat. Thus far, I think you have really started to free people, again, it's like the rat study. It's like we're starting to let more and more rats go exercise when they will. You know, talking about the fact that hey, yeah, you need to eat some more fats. Yeah, you need to go, maybe not exercise like a total freaking maniac. It's like all the stuff we...hey, yeah, you need to have your cheat meals. I think this is good news for all of us.

I think this is a great time to talk about, we referenced earlier, so I want to get into it, because I really, really love... I think number one, because I'm such a Seinfeld fan, but number two, I think the idea is so perfect, is to live like George Costanza. So, if you can explain that application that would be great.

MN: Yeah, I'm a big Seinfeld fan, too. If you can recall, the one episode where George does everything the opposite that he's ever done in his life. And all of a sudden, like everything starts working for him perfectly.

So, he's on this mission to do everything the opposite way that he thinks he should. And everything starts working great for him. So, I always struggle with... Because, you get the elevator question. "I want to lose fat. What do I do?" You've got like 30 seconds to answer. You don't know any history. You don't know anything. I always give them sort of the George Costanza...do the direct opposite of everything you've done now.

If you're unhappy with the results of where you're at currently, then what you're doing, you've already proven isn't working. So, the logical solution, if you were...just s hot in the dark, is to do the direct opposite.

So, if you're doing a lot of moderate intensity treadmill work. You're not strength training. Your diet is mostly...primarily carbohydrates. I would try the opposite. I would go life some heavier stuff and I would decrease my carbohydrates.

It seems like so intuitively like simple. But, it works pretty well. I mean, if you just have a short period of time and you're not doing anything custom and someone says, "Well, what do I do?" and you've got like one minute.

The reality is, long term, that's what you're probably going to do with most clients anyway. I mean, you can individualize it a little bit more. But, if you ask where they're

at and they're unhappy with it, then what they've been doing hasn't been working and they've already shown that.

CK: Yeah, and the unfortunate part is we have too many people that just severely try to defend these ideologies that they've been taught from someone else. I don't know why we take things so personally. And their body, their biology is clearly saying something so completely different.

So, yeah, it's... I think that is such good, such good information for people. I think it's such great wisdom, because it's so true. That is, I think, moving us closer to the idea of the scientific method, at the same time. I think you've done an amazing job thus far in taking very complicated information and complicated systems that our body is by far the most complicated thing I think that exists. It's a really cool thing to see how easy you've made it. It's just true.

I don't know if you have any specific testimonials or specific stories that you'd like to share with us, just to give us some ideas as to what's happened.

MN: Yeah. I'm actually working on a product on this and if any of the people that are listening to this, the live seminar will hopefully be the end of this October 2010, will be recorded for a DVD that will be out shortly after that.

So, in the process of basically trying to collect as much data as I can, because I'm an oober scientist guy and I like numbers and all that kind of stuff. We've got a couple...I mean one guy via a Bod Pod measurement, which is probably considered one of the gold standards for body fat measurement. It's right up there with underwater weighing. He's gotten his body fat down to below 9% and he's getting close to deadlifting three times his body weight.

CK: Wow!

MN: I mean, he's not a competitive lifter, per se. I mean, he works a normal job, eight to five. Another guy, Adam Glass has...obviously he does a lot of exercise. He's been exercising for a long time. He's a little bit more of an extremist. So, one of the things, once people get closer to being more metabolically flexible, is we actually have them add sort of what would be considered distress eating.

So, in a perfect world, if someone calls you up and goes, "Hey, let's go out to dinner tomorrow night. We're going to the Chinese place." "Oh, okay." You go, "Alright, great." You go out and you would enjoy your Chinese food and not really think anything about it, knowing your body could handle it and process it and you're not going to feel like you're going to sleep for 12 hours afterwards or be nauseous or whatever.

So, one way to do that is just to test various items. So, I know Adam for a while was testing Raman Noodles, I think. If you think about it, and Adam talked a little bit about this, too, is... An extreme example, let's say you're a Special Forces guy and you get deployed over in Korea somewhere at like 24-hour notice. Do you really want to be the guy that's packing all your protein powders and all your specialized food and all this stuff? It's like, no. You want to just walk in and go, "Hey, what's that? Oh, it's good."

CK: You know, I just went on vacation in Florida. So, we've got farmers that we regularly deal with and I get my produce from some local farms, my dairy, my eggs, all this kind of stuff from very trusted sources. But, you know, I went to Florida and I'm in the middle of nowhere that has only the most basic grocery store you could find. So, the quality of the foods that I had at my disposal was pretty different than what I'm used to.

And the whole thing is, because I had been utilizing this understanding in my life, I'm able to go into this and go out to eat on vacation. Or, go to the grocery store and have all these foods and not have the negative side effects to the point in which I can't even enjoy my vacation because my body can't deal with a little bit of lower quality stuff for a while.

So, the freedom is awesome and I have personally experienced that. I would say a few years prior to this, I would have argued this over and over and over, because of certain scientific theories that when it's all said and done, it's very accurate. So, I love that.

MN: And it's not that I'm saying whole food, unprocessed fruit is bad at all. That's actually very good. I'm not saying you get to go out and eat Raman Noodles for every day of your life. But, the point is that you should have the personal freedom to decide. Like you said, I went on vacation and I didn't worry about it for a week. I was fine. Each person should have the freedom to decide, where do they feel comfortable? And people that say, hey, I like eating more organic, unprocessed foods most of the time. I have access to them when I'm at home. I think that's awesome. That's probably a better way to go.

The caveat, as you just stated, is you would still probably want to do enough eating of 'other stuff' or 'bad food' so that when you would encounter that, you wouldn't have an issue. Again, like my buddy Frankie says, it's the minimal effect of a mouth. That will vary for people. For some people it's a couple of meals a week. Other people want more freedom, so they'll eat whatever they want most of the time. I don't have an issue with that, again, as long as you're making your goals and that type of thing. It should be that each person gets to decide how much of that that they want to do. And everyone will have their own little set point where they feel comfortable.

Like, for example, today I'm working on writing up the study. So, I decided I don't want to eat as much. So, I figured it's a good day to do some testing. So, I've been testing protein bars, and ironically, Monster energy drinks. Like, even a year ago, I did a whole study on Monster energy drinks and I had never drank one in my life. I'm not saying I'm going to live on Monster the rest of my life, but if I have a can on occasion, I don't really worry about it. I don't have any ill effects from it. I don't feel like I'm going to die or feel like I'm going to go to sleep after the caffeine wears off, or whatever.

CK: One of the things that you and I have talked about before, too, and this is kind of a side note. But, there is the principle of use or lose it with our physiology. At some point, the way that I see it, and I always kind of put it to people is, okay, number one, we have detoxification pathways for a reason. So, we need to use them a little bit. Number two, if you're going to be so ideological in your stance that you're not going to consume this stuff, that oh, my gosh. I'm never going to take-in anything that's not 100% free range, grass fed, you know, local, organic, biodynamic, on and on with all the different markers they have for it. I say, okay, that's fine. If you don't want to do that, that's fine, but I hope you taught yourself how to not eat for a day or maybe several days, if not longer than that. Because, there are probably going to be times where you're going to have to do that. So, what do you want to be able to do? Do you want to have to fast for a week? Or, do you just want to be able to have some fried rice and not worry about it?

MN: Oh, yeah. A last quick point, before we wrap-up, is that I actually do have people do 24 hour fasts or 16 hour fasts or whatever. There actually is a research study showing that basically people that were very metabolically inflexible, if they did a fast it temporarily restored metabolic flexibility. Meaning, that they were still under fasting conditions, able to use fats as a fuel, which is a good thing. So, that is one of the other ways you can increase metabolic flexibility, especially, and I totally used to be this person that, oh, my God, if I didn't eat every two to three hours, I was dizzy, light headed and cranky. So, that's probably not the best way to be, because my body had adapted to the eating every two to three hours.

Now, I can do more variable meal spacing. I can do 24 hour fasts and be okay with it. And again, going back to sort of a survival mechanism, there may be some places where you're stuck and you don't have access to food for 24 hours. You can go, "Well, I've done that before and I was alright."

CK: It's perfect. I mean, like you said, especially the... I think what's really interesting that we're finding from this is the fact that not only are we talking about the ability to increase lean muscle gains, the ability to decrease fat stores. But with all of this comes... We're making it easier to do all this stuff. And one of those ways is actually to stop, to get off the spinning wheel of this eat every two hours, bodybuilder style of living.

What we're saying is number one, free yourself from that. Number two, when you do that, you actually make it easier on your body to accomplish what you want to accomplish, and that's amazing. That's pretty cool. I think for everybody, that should be very freeing.

MN: Yeah, and the last point is, I mean, there's pretty good research to show that eating every two to three hours in terms of muscle anabolism may not be the best idea, either. You actually need, go figure, variability. You need the high levels of amino acids and ironically, low levels in order to trigger the muscle protein synthesis process, too.

The recommendation, through lots of work on leucine and branch chains and everything, is that by eating larger meals spread further apart, that the anabolic response is actually greater.

CK: Well, look at that. That's a pretty cool thing. We're always in pursuit of what can I do to be more muscular, less fat. And what we're saying is it's actually...not only do we have a new approach to it, but it's easier than anything you've ever done before.

MN: Yeah, it's crazy.

CK: Well, Albert Einstein said, "In life, make things as simple as possible, but not simpler." I think metabolic flexibility is hitting that nail right on the head. So, if there's anything else, Mike, that you want to leave us with, maybe just wrap this thing up. We've obviously learned quite a bit, and wanting to remind people to go check out [ExtremeHumanPerformance.com](http://ExtremeHumanPerformance.com) and check out the webinars, where they can get this information.

I actually had the opportunity to just get on the webinars recently and not only do you get to hear this stuff again, but you get to see it and you get to own that material. So, Mike, if there's anything else you want to leave us with, that would be great.

MN: No, that's cool. Thank you very much for your time, and the wonderful interview, Craig. I guess the main point is that I think variability overall is a good thing. We used to think that variability was noise and all this data, and we tried to eliminate it. And now, we find out that, holy crap, there's a lot of information in there.

Again, like you had mentioned, your body is always adapting. So, you just have to think of what is it adapting to, and then what is sort of the best way? Ironically, from what we know now, what's being sort of sold as you have to be more hardcore and suffer and do this every two to three hours and do this. It may not actually be the best way. And it's for each person to decide how far they want to take it. But, it's nice to know you have the freedom to do it.

A couple of years ago I went on a kiteboarding trip down in South Padre, Texas. I was out kiteboarding, every day for like six days. I basically lived on...I had one good meal a night. During the day I lived on water, Pop Tarts and protein bars. I had a beer after I got done riding at the end of the day, another one with dinner. And I got home and in a week I had lost like two or three pounds. I'm like, what the Hell is with that?

Now, I'm like, well, my calories were probably less. I didn't have any problem eating the foods. I was ironically doing more of a distress eating without realizing it. And I was active all day. I was out moving around for five to eight hours a day.

And so, it's kind of funny how you look back. Most people would be like, well, that's just insane. And there's nothing magical about me, it's just something that most people, once they get to that level, can do. It's kind of nice. You don't have to worry about it.

Like you said, it reminds me of Louise. It's like, "In America," he's like, "we're so worried about our health that we're not healthy."

CK: That's absolutely true. Absolutely.

MN: Yeah, well, thank you very much, Craig. Where can people find out more about you?

CK: You can check out what we're doing at [www.TheMovementDallas.com](http://www.TheMovementDallas.com).

MN: If anyone's listening that are in the Dallas area, I've been to Craig's studio and I've hung out at his house and drank his organic milk and everything. So, I rather recommend you check out his place there. It's really good stuff.

CK: Awesome. Well, thank you, Mike. Thank you for getting us all this information. It was amazing. I can't wait for more people to be able to apply this and I know if they have any questions or any concerns they can find you on the web and pick your brain all day.

MN: Yeah, no problem.

CK: So, Mike is here to help, so everybody out there, let him help you. Thank you, Mike. We are excited about metabolic flexibility and looking forward to applying it and learning more about it. Thank you, Mike.

MN: Cool. Thanks, Craig. I really appreciate it.

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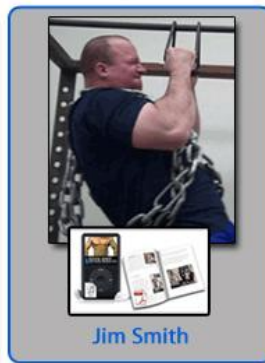
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