Episode 612: Dr. Gabrielle Lyon on Muscle-Cyntric Medicine, Eat Your Protein and How to Train Better

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Katie: Hello and welcome to The Wellness Mama Podcast. I'm Katie, from wellnessmama.com. And I really enjoyed this episode because I'm here with someone I love to talk to, talking about a topic that is very top of mind for me right now. And I'm here with Dr. Gabrielle Lyon, who is a Washington University fellowship trained physician in nutritional science and geriatrics, and is board certified in family medicine. She is the founder of the Institute for Muscle-Centric Medicine. And she has a private practice that services leaders, innovators, mavericks, and executives in various fields. She also works closely with special operations military. And her goal is to change the paradigm of medicine from obesity-focused to muscle-centric, and change the way we think about health and medicine with high science integrity. And the reason I was so excited to talk to her about this today is that, this has been part of my personal journey over the last couple of years, of shifting away from my idea of trying to get smaller and actually trying to get stronger, which inadvertently led to me losing body fat as well. And we talk about this in depth today, about what muscle-centric medicine is, and why muscle is so important, especially for women. We talk about the connection between body composition, and how we age, and what's actually going on in our bodies when we don't have enough skeletal muscle versus when we build skeletal muscle.

She talks about her research on how body composition affects the brain, why muscle is the organ of longevity, how muscle helps with disease prevention because it's an endocrine organ, why exercise should be about building muscle and not losing fat. We talk about the longevity connection of lean muscle mass, why it is very difficult for a woman to get bulky or too muscular, what reverse dieting is and how it can help us get stronger and leaner. And we talk about my journey with this. We talk about dietary protein as it relates to muscle health, why we need dietary protein, and the bare minimum versus optimal here. We talk about her

recommendations around that and her protocols. We address if women and men need to train differently or if our cycle affects our training. And then we go into lifestyle, diet, and supplementation factors that can help increase muscle. So we go in lots of different directions. She wraps up with some really beautiful advice that I love. I always love talking to Dr. Lyon. And this is such an information packed episode, and hopefully an encouragement to all of us listening, to make sure that we are doing enough resistance training. She really explains how this correlates to so many aspects of health. So without any further ado, let's learn why. Dr. Lyon, welcome back. Thanks so much for being here.

Dr. Lyon: Yeah. Thanks, Katie. It's really great to see you.

Katie: Well, I'm on a personal level, so excited to get to chat with you again. And also on an educational level, I think our conversations are always so fascinating. And I know people loved our first episode, we really honed in on why women need more protein. And I've heard from a lot of women who have really taken that to heart and adopted it since then. And I think today's is going to be an amazing follow up to that, focus on the other piece of this equation that I feel like society often kind of gives us misinformation about, but the idea of why we also need muscle. And you explain this better than anybody else I've ever seen. So to start broad and then really get into the nitty gritty of this. Can you maybe, kind of, introduce us to the concept of muscle-centric medicine, which is, I think, a concept you practice and maybe even coined?

Dr. Lyon: I did, yes. Thank you so much. Well, always great to be here with you, mom of six, we were just chatting offline, the two little ones. And really, I think that when you think about health and wellness, for anybody, moms, anybody, you have to think about muscle. And this concept of muscle-centric medicine really came from my own clinical experience. And luckily, when I was 17, I actually graduated high school early and I moved into my godmother's house, whose name is Liz Lipski. And Liz Lipski is the one of the OGs. I don't know if you know Liz. She's one of the OGs of the functional medicine space, even before Mark Hyman. So, really, has been around as kind of functional medicine and as root medicine was coming up, right, in its infancy. And I was able to sit into clinic with her with her patients. And it was all about nutrition. And it was all about how do you leverage nutrition as it relates to health and wellness. So, that really, from a young age, created a ton of interest for me. When I left there, obviously, I went to my undergraduate and I did it at the University of Illinois, Champaign Urbana.

And I know this is kind of like a long-winded way, but no one could understand where muscle-centric medicine would come from if I didn't tell you a little bit about the birth of it and the backstory. So I went and I did my undergraduate at the University of Illinois with a guy named Dr. Donald Layman. And Dr. Layman, for the researchers out there, is one of the world's-leading experts in protein metabolism. And a lot of the concepts that we are about to talk about, really were discovered in his lab. So this is a pioneer in the field as it relates to muscle health and protein metabolism. So I studied under him for my undergraduate, and then he continued to mentor me to this day, 20 years later. Which is a very long friendship and mentorship, and with that comes a way of thinking. As anyone who's ever had a mentor, you know that the mentor just doesn't tell you what to do, but really helps you formulate and think about things. So, fast forward, did medical school, and then I did residency, family medicine, and then I went back into training, and I did a two-year fellowship in clinical research and also medicine. And that was in geriatrics.

But my research was in obesity. Why is that important? People will think geriatrics is one end of the spectrum, and then obesity is another. But there's an interface between body composition and the way in which we age. And geriatrics is the study of individuals and the treatment of individuals over the age of 65. So I did this at WashU in St. Louis. And part of a fellow's responsibility or at least in my fellowship, was doing research. And part of my study was I was imaging people's brains. And I was looking at the way their body composition

actually affected their brain in terms of cognitive tasks. You know, we did a whole battery of testing. And in addition to that, we looked at fMRI changes, so brain imaging. And what we found, and there was one patient in particular that really tugged at my heartstrings. And she had been a mom of three, always yo-yo dieting, putting everyone first, and had lost so much muscle over the years. And her metabolism was just shot. So she was pre-diabetic, she had insulin resistance, all this stuff. And when I imaged her brain, it looked like an Alzheimer's brain.

And it was at that moment that I realized we were telling the wrong story. We'd constantly been telling this obesity story and trying to fix obesity for the last 50 years, that we were failing the people right in front of us. And it was at that moment that I realized that the one thing that all people have in common isn't that they have obesity in common. It's not that they're over-fat, it's that they're under-muscled. And if we were going to get to the root cause and actually create change for people, we had to shift the paradigm from this disempowering way of thinking about things, to something that people could actually do something about. And that's where muscle-centric medicine was born. And muscle-centric medicine is this concept that muscle is the pinnacle of health. It is the organ of longevity, and it dictates everything about how we age. Not just physically, mentally, but also it's really the ultimate in disease prevention. And it's this tissue that we need to optimize for, versus this constant narrative over the last 50 years of, how do we, you know, decrease more body fat? It's the wrong question. And that's why it's been so difficult to treat.

Katie: That makes perfect sense when you explain it like that. And I love this approach, because to your point, it's not focused on the negative, and not the, like, we should eat less, and all these things. But it's focused on a positive metric, which psychologically helps humans so much more. And, you know, the psychology behind when we restrict something or label it as bad, we actually might crave it more, and everything that goes into that. Can you say more about how muscle helps with disease prevention? Maybe what's going on physiologically?

Dr. Lyon: Yeah, this is a really great question, and probably the most important. Skeletal muscle, we've been trained to think about just as the fitness and performance realm, because it is essential for our activities of daily living. It's essential for mobility, and picking up your kids, and, you know, doing whatever it is that you're doing. And that definitely really affects individuals as they age. So, yes, it is also about looking good in a bikini and physical performance. Okay, so we we've already identified that. The real magic of muscle is the way in which we utilize it. So, one of the things that makes muscles so special, is that we have voluntary control over it. And what do I mean by that? Well, I can go and I can pick up that weight, and I can do a squat, and I can improve... You know, again, I'm speaking in broad terms, improve my insulin sensitivity, do something that I actually have control over, and control how hard I'm going to work and what muscles I'm going to train, to be able to have a cascade of events that happen in the body, right?

Nothing is more potent than exercise. So that's kind of, like, a broad overview. What do I mean by talking about the potency of exercise and the way in which muscle kind of interplays within that? Well, yes, exercise for cardiovascular activity, fine. But muscle is an endocrine organ. And the action of muscle actually creates an environment in which we can, say, store nutrients. So for example, glucose, glucose, or the carbohydrates that you're eating. The main site for disposal, so getting rid of it, is in skeletal muscle. The healthier your skeletal muscle, the more flux that you have, the more nutrients that are coming in and out of muscle, potentially the more healthy the muscle is. As opposed to a sedentary muscle that ends up, over a period of time, looking like a marbled steak. So from a metabolic standpoint, muscle is your suitcase. And as your suitcase is emptied... You know, again, these are simplified terms... Emptied, it can be refilled. And through exercise, we create space in the muscle to allow for a place of disposal.

So that's one kind of component. The other really interesting aspect is that, when you contract skeletal muscle, it produces these myokines. And myokines are proteins that have anti-inflammatory effects in the body. Most notably, interleukin-6 is probably the most famous one. And it interfaces with, say, pro-inflammatory cytokines, which again, are just proteins that can push the body to a more inflammatory state to allow the body to come back into homeostasis. So essentially, you can utilize exercise to leverage muscle to allow for metabolic health, by opening up your suitcase, being able to put nutrients in it, by utilizing skeletal muscle for its myokine effect. Which again, have an anti-inflammatory effect. It, you know, helps in modulating immune diseases. It even helps with brain function and bone density. There's all these different things that it does. So that's just a handful of things that skeletal muscle does.

Katie: And there's also, from my understanding, a pretty strong connection to the amount of lean muscle mass we have and a whole host of longevity factors. And I would love to talk a lot about that. Because I know, from my reading, for instance, muscle, we know burns more at rest than fat does. And you just talked about the suitcase analogy, which I love. But I feel like historically, I feel like this is shifting, but there's been more of a focus on cardio for women. And women have been in general, more hesitant to do heavy strength training exercises. So, maybe let's kind of go deep on the longevity, anti-aging, what's happening when we have lean muscle mass.

Dr. Lyon: Probably my favorite conversation is really this longevity piece. And as a trained geriatrician, this is very near and dear to my heart. Now, when we think about longevity, I think that we should define it. So, longevity is typically defined as the length of time someone lives, right? And that's important. But I think what's even more important is kind of the quality of an individual's life. So, in the media, you hear a lot about this kind of protein restriction, and how protein restriction is going to "increase longevity." And I would say, if we really believed that muscle was the pinnacle of health, then the quality of that tissue really requires two things. It requires exercise, most notably resistance exercise. Strength, you know, resistance exercise for the input to get to strength and/or hypertrophy, which is actually making the muscle bigger, which I actually think is quite valuable, because it does have the potential to increase somewhat of storage space. How much? Again, you'd mentioned the more muscle mass you have, the better off you are.

I believe that to be true, that the more healthy muscle you have, the better off an individual is. So let's take a look at why optimizing for skeletal muscle. And number one, how much is optimal? I don't think anybody knows, which is interesting. We know where body fat percentages become a problem. But we don't actually know, aside from major disease states, like frailty, sarcopenia, and cachexia, percentage of, you know, body mass loss. We know that those are really critical states. But Katie, I can't tell you where your... I can guess where your optimal muscle mass is, but I think these are very complex topics. And I don't think that we have a great way of identifying that. So that's something to think about. And listen, you can do something like...it's called an appendecular skeletal mass index, which you can get... You know, you can go, you can get a DEXA, and kind of identify how much muscle you have. But it's not a direct measure, by the way.

A DEXA scan is not a direct measure of muscle mass. It looks at fat tissue, and then lean tissue. And lean tissue includes everything. It includes bone, it includes all things other than fat. So I think that that's important. So the role that muscle plays in longevity is exactly what you said, from a metabolic standpoint. These diseases that we think about, these metabolic disturbances, changes, for example, insulin resistance, diabetes, obesity. These somewhat pathological states, really, I believe, begin in skeletal muscle decades early, which I think is critical. So, again, this was your initial question, is, how does muscle play a role in longevity? Healthy skeletal muscle is going to increase your survivability in nearly all things. And it's very rare in medicine that you can say, X, this thing is going to improve your survivability. And skeletal muscle and exercise, I would say is it.

Katie: That's fascinating. And you talk about we don't know exactly for sure the optimal amount of muscle. I would guess, and you can correct me if I'm wrong, but if we're strength training, gaining muscle through natural methods, I would guess it's much more difficult to hit that upper end of too much muscle than it is to not have enough muscle. Right?

Dr. Lyon: Exactly. Katie, you can tell that you're very well read. That's absolutely true. And it's interesting. This kind of leads into the fear that you had said, that most women kind of are afraid to become bulky. It's very difficult. If you are an untrained woman, then there's this training, this new athlete, or new training stimulus. So you maybe could put on, if you do everything perfect, a pound of muscle a month, right? So typically women can put on half of what a man can. And again, this is, like, in a perfect world, where you're doing everything, you're recovering, you're creating enough stimulus, you're eating enough protein, you're doing all these things. And I think that the idea that an individual would look too jacked or get too bulky is near impossible.

And that's really a fallacy. And I think that that hurts...you know, conceptually really hurts women and anybody. Because again, the idea of just doing cardiovascular activity, it is very beneficial. It's important for cardiovascular function. There's benefits, again, I'd mentioned these myokines, there's benefits for mitochondrial health. All of these things are beneficial. But you must add in resistance, that resistance training piece. It's critical.

Katie: And for me personally, that was so freeing to learn because I've personally hated the, like, long endurance cardio to begin with. And to echo your point, this past year has been an experiment in strength training for me, and really just pushing to see how strong I could be. And I now have lifts that are in the, like, 400-plus pound range.

Dr. Lyon: That's amazing. That's incredible.

Katie: And I've gotten leaner and smaller, and less bulky from doing that. Like, now looking at this, I look back and laugh how I used to think women could possibly get accidentally bulky, because I know how hard I worked for those lifts, and I don't feel like I look bulky at all. But I think that brings up a good point, which is, if women are trying to focus on this as a better metric, and focus on the positive, and build strength versus, like, losing weight. You know, I think there's so much psychology to that too. As humans, we don't like to lose. And it ties into women historically, taking up less space, and, you know, taking up less room in society. But if we want to focus on the positive and getting stronger, what are some good metrics we can look at, to keep track and, like, pay attention to as we go, with the understanding we're not likely to, you know, slip and fall and end up a bodybuilder?

Dr. Lyon: Yeah, that is also hilarious. I think that you actually highlighted it right off the bat, when you said that you're now moving into lifts that are some 400 pounds. Getting together a system in which you can measure. So, listen...and it's interesting, right? So the more you learn in this space, the more you see that there's variables. So I would normally, before I interviewed one of the PhDs I interviewed for my podcast, named Pat Davidson, I would have said, know how much you squat, track your squat, deadlift, and bench-press. Right? So you're gonna find out, you know, what your weights are, and you're going to track that over a period of time. And then I would also say, like, how long can you do a dead hang for? How many pull ups can you do? How many pushups can you do? How many sit ups can you do? How fast can you run a mile? Okay, so this is what I would have said before. And again, as you learn more about science, you realize that there are certain things... Okay, well, is that true? should everyone be doing a squat? No, not necessarily, right?

I believe that what you should do is, you should pick exercises that you know that you can do safely. And this might actually start out with machines. It might be a leg press, it might be a hack squat. And figure out what is your baseline starting point. You know, I don't think that you have to go to a one rep max. Right? I think that you can kind of, you know, do an estimate in terms of training. See what could you comfortably do for 10. You know, where are you there? And then track it over a period of time and see that you're making incremental increases, because strength is going to increase before hypertrophy, typically. And, you know, we see that often that, you'll see, I don't know, you'll see strength increases before you'll see hypertrophy. And I'm sure that you started to see that too, yourself, Katie, that you saw strength increases before you actually saw changes in muscle size.

So for the listener at home, picking a handful of exercises. And I would say a lower body exercise, I would say a full body exercise, if you can, and an upper body exercise. And track and determine where your baseline is, and, you know, see incremental changes. And I know that that's a bit nebulous, but again, when I think about exercise, and I think about training, I think it's much more difficult to provide a prescription than nutrition. So nutrition, I could say, "Katie, you're 125 pounds. I'm going to recommend 125 grams of protein. I'm going to recommend this much fat, and this much carbohydrates." I know exactly what you're getting in. But if I say, "Hey, Katie, I want you to squat." I don't know what kind of muscles you're recruiting. I don't know if you're using mostly your back. There's so much more variables that go into training than goes into nutrition or medicine. So that's just something for the listener to think about. But again, establishing a good baseline, I think, is really critical.

Katie: Yeah. And I feel like tracking that is fun to see those trends increase over time. It was also really encouraging for me to read that women can be as strong as men, pound for pound, lower body. And still realizing, like, I may never be able to bust out as heavy of a bench-press as a guy, and I'm fine with that, but tracking in relation to myself. But realizing, like, the more I do this, I actually can be very competitive with guys in lower body lifts.

Dr. Lyon: Yea I love that.

Katie: And there's so much, I feel like, so many directions, we could go with this, but I'll make sure I link to our first episode, which was very focused on protein. But I don't want to skip that as, at least, a talking point here, because I think this is another area that women often miss. And if they haven't heard our first episode, this was a huge factor for me that I got wrong for a long time. Where I was having trouble building muscle because I simply wasn't eating enough in general and eating enough protein. And as a personal, vulnerable example, in the last year, when I actually started tracking, I went from some days only eating, like, 800 calories because I was busy and not paying attention to it. To now I'm eating like 2400-plus calories a day. I've gotten leaner, and I've gotten stronger. So I want to, like, really hone this in because I think there's so much freedom for women when we realize, like, you can actually sometimes eat more, get leaner, and get stronger.

Dr. Lyon: Yeah. So, basically what you did is you reverse dieted yourself. So when you had taken a period of time and you were only eating 800 calories, the body adapted to that. So it was able to conserve the amount of energy that you were feeding it. And what it sounds like you did, as you slowly transitioned your calories while monitoring your body composition, you essentially reverse dieted yourself back, which is incredible. But let's talk about dietary protein as it relates to muscle health. I think that if individuals get dietary protein right, everything else within health falls into line. You also brought up a really good point. You were training, but you were under-eating and under-eating protein. People will often ask me, what is more important, exercise or diet? And I think that's a really tough question to answer.

What I will say is that, the stimulus that exercise provides is much more robust than anything else that we could ever do. The stimulus that exercise provides is much more robust than anything. The global effects it has in the body is more impactful than nearly any medication I can think of. Right? The systems in which it works. So that being said, what percentage of adults are actually meeting their daily physical activity requirements? I was looking at the CDC recently, it's about 23%. So that means almost... You know, that means, gosh, more than 75% of individuals are not meeting their daily activity requirements for muscle health, right? Overall, what the CDC recommends. So, again, what's more important, I would say, exercise provides a more robust stimulus. But if 75% of people are not doing it, we have to address the low hanging fruit. That is, food. Every single person is eating, or ingesting food, or they're not surviving. Whereas I can think of many people I know that can survive without exercise ever. Right? They're not going to die immediately. You can live without exercise, but you can't live without nutrition.

So if 23% of adults are actually meeting the CDC recommendation for exercise, 100% of the people are eating food. Right? So that is just kind of to lay out the foundation of, okay, so what do we need to do to maintain healthy muscle? And I think there's a lot of controversy in the space. Nutrition is probably more, if not as controversial as politics and religion. And there's the calories in calories out model, there's the carbohydrate insulin model. What I think about is, I think about muscle from a muscle-centric perspective or a muscle-centric model. And in order to maintain healthy skeletal muscle, you do need dietary protein. The current RDA is 0.8 grams per kilogram, that is the bare minimum to prevent deficiencies in 95% of the population. Okay? So that's to prevent deficiencies. Is that optimal? And it's not optimal. And it's interesting, the way that people look at dietary protein is different than they look at any other macronutrient or any other vitamin and mineral, in my opinion.

For example, if someone is sick, Katie, one of your kids are sick, you're going to be like, "Oh, I'm gonna give you an extra dose of vitamin C." Right? You won't even think about it. But you wouldn't say, "Oh, hey, you're not feeling well, I'm going to give you an extra dose of protein." Nobody ever thinks like that. Instead, they look at the... No one looks at the RDA for vitamin C at 60 milligrams to say that that's the optimal, right? But everybody, it seems, most people seem to look at the RDA, which is 0.8 grams per kilogram for protein, as the optimal. But it's not. It is, again, the minimum to prevent deficiencies. So the evidence would suggest that likely more, like, double that, at 1.6 grams per kilogram, is a more optimal range. And just for simplicity's sake, what I recommend my patients do in my clinic is one gram per pound ideal body weight, which is robust and higher than the recommended. But there's no evidence to support, that I've seen, that higher levels of protein can be detrimental. But lower levels of protein we know can be detrimental for muscle health.

Katie: Yeah. And there's of course, lots of longevity connections there as well, even just for people under-eating protein. I'll make sure again, I'll link your first episode in the show notes. You guys definitely listen, if you haven't already heard that one. Because we got to go really deep on the protein topic. But one thing we didn't go super deep on that I want to mention here as well is, I know you also have kids. And obviously, they're in a very rapid growth phase during childhood. And so it would seem to me that they actually would have a higher potentially proportionate protein need as they're building their skeletal muscle for the first time. But how do you think of this in terms of your kids? And how can we as moms make sure our kids are getting a good foundation here?

Dr. Lyon: This is a great question, and one that I've thought a lot about. Obviously, because I have two very little children. And it's interesting, the literature would suggest that, as adults, we need a bolused amount of protein, right? Because again, skeletal muscle does all these things, and it is a nutrient-sensing organ. And it requires, as individuals age... And when I say age, I mean, I don't know, when your growth phase is done, to

get a bolused amount of protein. Whether it's a minimum of 30 grams, which is, you know, a little over four ounces per meal. But when you're younger, you're driven more by anabolic hormones. You're driven by insulin. You're driven by all these other hormones because you're also still growing, right? So you're actually growing. Those individuals, those kids actually don't need to think about protein as a bolused amount.

And again, I've actually thought quite a lot about this. Because for men and women, the minimum amount to stimulate protein synthesis is the same, because it's based on the amino acid threshold. For kids, is it that they need less protein per meal, because they have less blood volume? I don't know, potentially. But what we do know is that they don't have the same meal threshold. And because kids are so highly anabolic, that they could get away with 5 grams of protein and have a robust anabolic effect, or 10 grams of protein and have a robust, anabolic effect. Again, have we ever measured this? No, because kids, you know, there's a lot of restrictions in terms of the anabolic potential and the effects, you're not going to do a muscle biopsy on a kid.

Katie: That makes sense. So just making sure kids have good access to clean proteins is probably enough when they're little.

Dr. Lyon: It's actually critical. You know, during this growth phase, and also as you are maintaining and learning, you know, kind of building your natural strength, this is critical. So dietary protein is absolutely a critical component of that. And not only that, when you choose high quality protein sources, they typically have a lot of other nutrients like iron, zinc, B12, selenium, all these other things in them. Whether it's red meat, chicken, eggs has, you know, choline. So there's all kinds of benefits when an individual prioritizes protein. And then again, childhood obesity is a real problem. We already know that, you know, almost 40% of individuals are obese right now, overweight or obese. This is a problem. And really protecting... You know, I interviewed someone named Dr. Samuel Buckner, who is a special... He runs the muscle physiology lab at University of South Florida. And one of the things that he said is that when you are young and active...if you are young and you are active, that's probably the most important thing that you could do for your overall health as you age, just when you are young, is be active.

Katie: Wow. Well, a good reminder for our kids and for ourselves. You mentioned the minimum for simulating protein synthesis. Can you just give us some good general guidelines of how much per meal, how many meals per day? I know these are like hotly debated topics.

Dr. Lyon: Yeah, well, I actually have a couple protocols that I use, just to make it very user friendly. I have a book coming out. You know, it goes in presale in February. It doesn't even come out till September. But I've outlined three protocols. And basically, when you think about dietary protein, and you are thinking about optimizing... Let's talk about what you would do if you were optimizing for muscle mass. If you were optimizing for muscle mass, again, you figure out how much protein that you need total. And you're typically in a little bit of a calorie surplus. For women, I tend not to go more than, you know, 20% of their basic maintenance calories, because I think people don't want to put on excess body fat, but you are in somewhat of a calorie surplus. And it could be anywhere from 10% to 20%. Identifying what your protein need is. And so determining your dietary protein. Again, if you go to one gram per pound ideal body weight, you're going to cover it. It's going to be enough. And then understanding that if muscle hypertrophy is your goal, you could easily break out your meals into four separate meals. And it would be more of an even distribution.

And the reason it would be... Again, it's interesting because all the studies, the majority of any study that I've ever seen typically looks at the first meal of the day. We don't actually know how long... Once you stimulate muscle protein synthesis, we believe that it goes on for about five hours. But again, spacing out the meal distribution. So you have your first meal, if you're going to divide it into four meals. You have your first meal in

the morning, and then your second meal could be three to four hours later, and then continue on. But each meal should have a minimum of 30 grams of protein. And when I say 30 grams, I'm really talking about in ounces, that would be a little over four, four ounces. So for every one ounce of beef, there's seven grams of protein. So let's say you ate five times seven, you're getting 35 grams of protein, or a whey protein shake, however someone would want to do it. And then, you know, for me, I actually think about carbohydrates next. And I'm not an anti-carb person. As long as someone is metabolically healthy, I have no issues with that. And then really, I tend not to put carbohydrates in that first meal of the day. I prefer individuals have carbohydrates pre- or post-workout. But, you know, you can spread it in the rest of the meals not to exceed 50 grams...40 to 50 grams of carbohydrates per meal unless you're really focused on exercise recovery.

And then fat, I believe that people don't need to add in a lot of extra fat. You can just pick lean cuts of protein or low-fat dairy, those kinds of things. So that's what I would do for someone who is building muscle. And then of course, you can't just build muscle alone, you do have to provide a stimulus. There's many different ways to get that stimulus. But, you know, resistance training is primary.

Now I think we've talked about weight loss. I think weight loss is really important. When I think about weight loss, I like to have an even distribution of protein. And there's nothing magical about it. And someone could actually lose weight if they had their first meal robust in protein, and their last meal robust and protein. But individuals who need to lose weight, I think an even distribution has benefit, and I'm going to tell you why. An even distribution of protein for nearly all of my patients, initially, we start them at 30 grams of protein three times a day. Super easy, they don't have to think about it, everyone can do that. The first meal could be a shake. And we put a one-to-one ratio of protein to carbohydrates. It's not overly restrictive. And by balancing their nutrition, you can mitigate hunger. So really, just by correcting those macronutrients, you can mitigate hunger. You can actually improve body composition that way and spare muscle and lean tissue.

Katie: And what about the training side of this? Because I think this also might be a newer concept for some people who haven't done resistance and strength training throughout their lives. And, like, for instance, I think... Like, my mom is in her 60s, and while she's very active, she's never really focused on that. And so for someone who's new at the strength training side, what is a good program, what does optimal look like? And then what would also be the sort of minimum effective dose that we should all be getting?

Dr. Lyon: I think that that's a great question. And I'm gonna give you a couple of different answers. The good news is, if you're totally untrained, you're going to make the most gains. So this is amazing. This is a great way to leverage your motivation. You know that you're going to start out there...if you've never trained before, you are going to make the most rapid gains out of anybody. So starting with a win right there. So there's that.

I recommend, again, there's multiple different ways to address body composition, and exercise, and all that stuff. But really thinking about moving well. And I really believe individuals should have a trainer. I know there's a lot of discussion about, you know, not feeling comfortable going to the gym, but this is kind of a non-negotiable. So three to four days a week have some kind of resistance exercise. It doesn't have to be heavy weights. It could initially be bodyweight movements, you know, it could be bands, it could be ways in which you're going to progress up. But knowing that you're moving well and moving safely. Like, there's nothing worse than having a setback, right.

So that's really important. So three to four days a week. And it can be full body exercises. Again, you're acclimating, you're gonna have, you know, a central nervous system kind of acclamation, a neurological acclamation first. So those all ways in which you're going to adapt. So the current recommendation is 150 minutes of moderate to vigorous activity a week. It's not that much, 30 minutes, five days a week. Is that

right? Yes. Thirty minutes, yes, five days a week. Okay. So that's pretty easy. Pretty, pretty easy. The aspect of that, you know, everyone should be doing that.

And then also walking, moving, right? Keeping muscle insulin sensitive. There's nothing worse than being sedentary. So you don't have to... Again, we should think about exercise on the continuum of our life. Pick something that you enjoy. We've all heard that. But actually, I think that there's some benefit to doing something really challenging once a week that you don't necessarily want to do. And this could be some kind of interval training, if you're a novice. You don't have to jump right into, say, sprint intervals. But doing something that is somewhat more high intensity is important. And it could be just a couple of minutes, it could be 4 minutes, it could be 10 minutes. Again, a well-trained program really does that.

Katie: Yeah, I love that because those levels seem doable. For me, I would say Bulgarian split squats are my challenging exercise at the moment. Like, I love them, but I hate them.

But I also am glad that you brought up sprinting, because I think this is one that seems kind of daunting for a lot of people. But the data is really cool about that, like, stimulating the body very quickly for short amounts of time and what it does over time. But from my understanding, this can also be done even if your knees aren't super strong. You can do it on an exercise bike or you can do it swimming. Like, there's lots of ways to stimulate high intensity movement in sprinting, it doesn't have to be running on a track.

Dr. Lyon: Totally. So I actually popped my hamstring doing that. And it has been this horrendously long recovery. So I don't actually recommend sprinting. I use a rogue assault bike. And also you could use that, you could use a rower, you could use a ski erg. And we typically do... You know, again, it just depends on what your goals are, but it's really easy to track. It's not a nebulous number. I know how many calories that I'm going to shoot for in how many seconds, right? Or if I'm on a rower, I know that I need to row in under two

minutes, I'm going to try to get 500 meters. So there's ways in which you can measure it. And then of course, the quality of your training is important.

Katie: And also, as far as this, when it comes to...especially for someone new, it's exciting. I remember that phase of, when you start off, you get to see the progress really quickly, which also is a good reminder that, like, as you progress, it's actually a good sign that it gets harder to go up in weight and that you have to….. And I've cycled some. But what is a reasonable expectation for someone who's starting? Maybe this is new to them, to train that much per week. Like, when do we see that progression from, like, a starting point to maybe now we're hitting, like, that optimal range for muscle being a longevity metric?

Dr. Lyon: I think that's a great question. I think that the first handful of weeks are really going to be this neuromuscular adaptation. Your body is trying to figure out in space, what it's doing. And those connections... Again, the first handful of weeks are really going to be more of that...yeah, the neurology of it. You know, typically, then you would increase in strength. And then depending on what you're doing, there is some potential for hypertrophy. Again, even if you are focused on strength, it's typically this, again, this neuronal input first for the first couple of weeks. But again, it's different for everybody, right? There is this concept of muscle memory, which is interesting, which people often think about, is the remembering of the ability to do something. But I will tell you, and again, this is just from clinical experience, if a person was very well trained, and then went through a period of detraining for extended periods of time, they seem to have a much more robust response than someone who's never been trained.

Katie: Which is fascinating. And for me, I feel like these are all things I learned as an adult already. But I think of this for my kids who are all very active, mostly in ways that are just play for them, but actually have a whole lot of bodyweight-based resistance training, like pole vaulting, and bar work, and that kind of stuff.

It makes me so excited for them, because I'm like, they've built this skeletal muscle foundation at a young age. So even if, you know, my daughters are training less when they're pregnant one day, or whatever the case may be, they're still gonna have that.

Dr. Lyon: It's the best thing that you could have done for them, quite frankly. It's the best thing that you could have done for them. Yeah.

Katie: Which that's exciting. And I think also gives, like, realistic targets for those of us who want to build muscle. Is it reasonable to think that we can keep progressing over time? Like, are we eventually going to hit a point where we can't progress anymore?

Dr. Lyon: So, I was reading a paper by Brad Schoenfeld and Alan Aragon, just the other day, about anabolic resistance. So anabolic resistance is this concept that...exactly what it sounds like. The body and the muscle tissue become somewhat less robust in its ability to mount a muscle protein synthesis response. So, essentially... Again, it doesn't have to do with age, it could be anyone who is sedentary, or injured, or any of these things. But we typically see this happen as individuals age. And I spent a lot of time thinking about it. Well, is it that we see an increase in anabolic resistance because the older individuals aren't training as hard? And what would it look like if we had master level athletes, how would their tissue compare to...a 30-year-old athlete tissue compare to a 70-year-old athlete tissue?

And I would say that, you know, as it relates to say, mitochondria, it doesn't look any different. And that's really fascinating. Again, I think muscle is very difficult to test, because it's very heterogeneous as opposed to fat. So fat is a homogeneous... I used to do fat biopsies and muscle biopsies. And fat is just kind of like all fat, whereas fiber types, your fiber type is going to be different than mine. And everyone's fiber type is uniquely

different. But I believe that if the training stimulus is enough, that older tissue can look very similar to young tissue. On the flip side, if you are younger, and you stop training, these issues, like with insulin resistance, and again, the way a marbled steak looks, you get a decrease in flux. So you get a decrease in the utilization of substrates. And over a period of time, you get fatty acid components built up, you know, and your muscle's like a marbled steak. But it's never too late to train.

Katie: That's so fascinating. And I'm going to try to find... I've seen images before online of women in their, like, 70s and 80s, who have strength trained for multiple decades, many who picked it up in their 50s or 60s, who look phenomenal. And you would have no idea they were in their 80s, which really, I think is a great visual of the anti-aging potential of this. I think there's also a lot of information I've seen online that women and men need to train differently. So I would love to address this. Like, are there actual differences we need to look at? Or how do we adapt this as women?

Dr. Lyon: Well, first of all, we just have to lay the foundation here. And most of the studies are not done in women. You know, there's a lot of male dominated studies. Males, you know, don't have their period, usually, or any of those other things. So, just traditionally, a lot of the literature is done in men. Do I think that men and women have to train differently? You know, there are some differences. You know, it seems as if women, perhaps have different adaptations to exercise. Does that mean that they need to train differently? I'm going to say some speculation, I'm not entirely sure what I think yet. But for example, there's some evidence that maybe some women need more volume, as opposed to a man. Again, I think that we just have to understand that while we're trying to simplify these answers, there's a lot that goes into play. Like, what is the hormonal status of the woman? What is the hormonal status of the man? What is the training age of each. But I think that there are differences. I think we can say that there are differences in substrate utilization, whether it's fatty acid or carbohydrates, men versus women. But, you know, more importantly, it's finding something that you're going to enjoy, and really pushing yourself. But I think that's a great question. I think we don't totally know.

Katie: And at the end of the day, there's a level of personalization and experimentation for all of us, I think, in this process. But do you think there's any weight to the idea that women might notice differences in training at different points in their cycle, just based on the hormone fluctuations?

Dr. Lyon: I was just gonna bring that up to you. I was just going to bring that up to you. So there's a lot of discussion about training for menstruation or when to go lighter versus when to go heavier. And I think that that's very individual. So I can tell you, me, personally, I've never noticed a difference. And I would say 95% of my patients have never noticed a difference. Have you had an experience either way?

Katie: Yes and no, because I could try to draw some patterns, but then there's always exceptions to those patterns. And, like, even when I do my yearly, like, fast, which I don't recommend people do lots of fast, but I do it for kind of mental, emotional, spiritual reasons. I have sometimes had workout PRs during the middle of a fast, which is not when you would typically think that you would, or I've had heavy lifting days while I'm on my period. So I think I could try to draw some trends, but I don't think it should be a mental limiter.

Dr. Lyon: So I agree with you. I couldn't agree with you more, you know. Yes, I just totally...I feel the same. Now, listen, if you are a professional athlete, and this is 100% of the things that you do, I don't know. I feel torn because again... So in my practice, I work with a lot of special operations, whether they've transitioned out or they're contracting. And can you imagine if we tracked everything for the guys, and then I said, "Well, you know, I know that you're overseas, and you need to go on this op. But your data says that your heart rate

variability is different." He still needs to perform and execute. So at what point are we over-identifying with the data versus just having to execute?

Katie: So maybe helpful if you're gonna use it in a positive thing of like, oh, I think I might be stronger while I'm ovulating, so I'll try heavy lifts that week. But not like, oh, I'm on my period, so I can't exercise. Maybe, like, focus on the positive. Okay. You also mentioned women can sometimes handle more volume. And for people who aren't maybe as familiar with workout terms, I'd love to just make sure we clarify. Is that meaning potentially more reps, or more sets, or also more weight or both?

Dr. Lyon: Yeah. Total voume. Yeah. And I would say that I think that there's potential to that. Again, so in my practice, we usually work with the fitness professionals. I mean, I don't write programs, but we definitely monitor to see if the stimulus is matching the outcome that we're looking for. And we definitely see that if someone is not responding, and we increase the volume, whether that would work for men or women. But I would say that there is some data to support that. And we do see it, we see it in clinical practice.

Katie: Okay. And I know we're gonna probably get lots of specific types of follow up questions for women who are, like, what about this particular thing. But I would anticipate a decent amount of questions about... And this is one for personally me as well, I'm curious about, is, if I'm gonna put all this time and effort into training, I definitely want to maximize the effect of that time and my ability to increase muscle. So are there any things we can do pre- or post-workout or supplementation wise in general that actually moves the needle there?

Dr. Lyon: Yes. So, number one, I think sleep is huge. So sleep is a free thing, that is huge. The other thing that I think is important is circadian alignment. And that's, like, a little nebulous. And here's why I think that. So, circadian alignment, there's always clocks in the body. And these clocks are really, oftentimes... One of the biggest regulators is food, food and light. And I think that understanding that getting on a consistent schedule, and eating, you know, kind of when the sun comes up, or whenever your morning meal is, being consistent with that, making sure you're prioritizing protein. And then at some point, you know, two hours before going to bed, making sure that you don't have any more meals, and really getting into that deep sleep. I think that there is some benefit to that.

I'll give you an example. When I was looking at the data for shift workers, a shift worker could eat the exact same macronutrient balance as someone who is on a normal sleep wake cycle, and they'll have higher blood glucose, higher insulin, and higher cortisol, even though they're eating exactly the same, but they're up all night. So, you know, those behavioral things, I think that there's data to support that they're impactful. And of course, rest and recovery is huge. Do I think cold bath, and sauna, and all that stuff is going to make magical gains? Not necessarily. Yeah, not necessarily. In terms of supplementation, I think that creatine is really good for nearly everybody. Vitamin D. For women, fish oil is good. And it seems to affect... You know, if I were to think about the mechanism of action, I think that there's some thought that it affects the ribosomes, right? So, fish oil. And then there's a compound called Urolithin A. And Urolithin A over a period of time can help mitochondria function. I work with a company called Mitopure, I think that they're amazing. And the research for Urolithin A as a...it's somewhat of a metabolite. It's like a gut metabolite that only certain people can make. But there is some good evidence that it supports mitochondrial function, especially as we age. So that would be kind of the handful.

Katie: Yeah, I think that's a great list. And I tend to think of all those things as never to replace, of course, strength training or eating the protein. Same with, like, sauna. I love sauna for recovery, but I'm not going to ever use that to replace exercise or to replace something else. This is maybe going to be a little bit more

nuanced of the question and not specific to everyone. But what about things like peptides, hormone replacement, as we get older? I know these are having their moment now.

Dr. Lyon: Super valuable, super valuable. If someone is a candidate, we use it all the time in practice. I think it's very valuable. And I think it's a game changer. I don't think that... You know, again, you don't just go on hormones and everything is magic. But the synergy between hormone replacement, nutrition, and training, I believe is as close to magic as you're gonna get.

Katie: Awesome. What about any negative factors that people may not be aware of that could sort of inadvertently blunt their ability to build muscle or kind of undermine them without realizing it?

Dr. Lyon: High levels of cortisol, chronically elevated cortisol, chronic inflammation. I think these can blunt the response to exercise. This is my opinion. You know, really making sure that you can regulate cortisol levels and inflammation, I think is really valuable.

Katie: Yeah. And going back to that, the sleep and recovery point, which I think often gets overlooked. I feel like this is one area, it is important to reiterate that threshold, the 150 minutes you talked about, is a great benchmark. But also beyond that, like, it seems clear in the data, like, more is not better at a certain point. Like, doing that every single day, and not giving yourself any time to recover, can actually keep you from getting strong over time.

Dr. Lyon: Right. And I think that's really important to understand. You know, and it could even be... Listen, are we having elevated levels of cortisol because we're all so super stressed? You know, who knows what it is. But these things all can definitely play a role. So I think that exercise...doing some kind of exercise is better than not doing any. I also believe that focus on progression is important, as opposed to people that we know that have done the same thing over and over again. While they're still exercising, are they progressing? And I believe that the human spirit really is designed to progress in everything that they do. And once you stop doing that, you really begin to backslide or do yourself a disservice. And that's true in anything. Again, because it's interesting, I see individuals at the gym who go in there training, and they are perhaps older individuals. And all they're doing is going there to move their body. And they're doing the exact same thing, and they're not actually progressing. Do I think that that's better than nothing? I do. Do I think that that is going to save them from the time that they have some kind of catabolic crisis, which is inevitably going to happen to everybody? I don't. So progression is key.

Katie: Okay, very important point. And that makes sense because the human body is so adaptable. If you adapt to an exercise, you're, by definition, actually doing less work to do the same exercise. So you're sort of, like, negatively progressing over time. I've also heard you talk about the food matrix of high-quality protein sources. And we talked about the macros of that. But what other things do we need to understand about the quality of protein? And I know in our first episode, again, to reiterate, we talked about leucine, and we got into some of this in depth. But at a high level, what else do we need to understand about protein sources?

Dr. Lyon: It's exactly what you said, it's within a matrix. So protein is within a matrix. It's not just thought about as this kind of isolated... You know, people talk about, well, saturated fat and cholesterol. You just don't go into your... I'm joking, because I'm in front of my kitchen right now. You guys can't see it, but I have, you know, lots of kids' stuff here. I don't go into my fridge and go, "I'm going to have a spoonful of saturated fat today." Or, "I'm going to go and I'd like to have my burger of cholesterol." Right? You know, we eat a lean burger, or we eat X, Y, and Z, and we eat dark chocolate, right, which has saturated fat. We eat these other things. And it's not just about the macronutrient of protein, the amino acids, but it's also the food matrix within it.

Whether it's creatine, and serine, carnitine. There's all these other things that we... Again, vitamins and minerals, that that's really what we're eating.

Katie: Got it. Okay. And I cannot believe how fast our time flew by because I could talk to you all day. And I want to hang out with you in person one day.

Dr. Lyon: Totally.

Katie: But I want to make sure we have time for the last couple questions. The first being, any book or number of books that have profoundly impacted your life? And if so, what they are and why.

Dr. Lyon: So, do you know that I actually have a book club?

Katie: I did not know that.

Dr. Lyon: Yeah. Myself and my....I have a partner in my book club. Her name is Emily Frisella. And we have a book club called Freedom Reads. And we read impactful books every six weeks, and then we bring the authors on. The last book that we had was "Relentless." And we had Tim Grover come on and talk about his book. A book before that was "Attributes," where Rich Diviney, former Navy SEAL, came on to talk about the attributes of great teams. So I actually read all the time. The current book that I'm reading right now is "The Mountain Is You." So that is the book in our book club. Is there one book that's impacted me? I would say that all of these books, I learned something from all of them. And I read all the time, hence, we have a book club.

Katie: I love that. Well, if it's okay, we'll link to that as well and I'll include those books in the show notes. Lastly, any parting advice for the women listening today? Could be related to everything we've talked about or entirely unrelated.

Dr. Lyon: Yeah. Well, number one, always be empowered by your choices, right? It's not the intention that matters, but the outcome that you're actually driving for. And if you can narrow the field of focus, and turn off all the analysis by paralysis, because of all the information, and just focus on the foundational things like strength training, and nutrition, and recovery. You're going to be doing great. And then the other thing I would say is, do the thing you're avoiding, do the hard thing, the thing that perhaps you're shying away from because that's usually the pathway forward. So, collectively, and no matter how someone wants to spin it, that pathway forward of resisting the thing, whether it's the nutrition plan, or the training, or the thing with work, or the book that you're supposed to write or any of those other things. Taking the path of most resistance is usually more spring.

Katie: I love it. I think that's a perfect place to wrap up. I will of course link to your website, and to your upcoming book and anything else that we can send people your direction. But I'm personally so grateful for your work, as this has been a lot of my personal journey the last year. And I love that you are reframing this conversation, especially for women, focused on the positive aspects of this, and the longevity, and the anti-aging, and not just the negativity of dieting that I think they've gotten way too much for the past decade. So, thank you so much for all your work and for your time today.

Dr. Lyon: Of course. It was really great to spend some time with you. And I'm happy to answer any questions that the listener may have.

Katie: Amazing. And thanks as always to all of you for listening and sharing your most valuable resources, your time, your energy, and your attention with us today. We're both so grateful that you did. And I hope that you will join me again on the next episode of the "Wellness Mama" podcast.

If you're enjoying these interviews, would you please take two minutes to leave a rating or review on iTunes for me? Doing this helps more people to find the podcast, which means even more moms and families could benefit from the information. I really appreciate your time, and thanks as always for listening.