The Fundamentals of Training for Muscle, Strength & Longevity

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Dr. Andy Galpin
The science and practice of enhancing human performance for sport, play, and life. Welcome to Perform. I'm Andy Galpin. I'm a professor and human performance scientist, and today we're going to be doing something for the first time ever in the history of Perform, and that is an open Q&A. I went to all of you a couple of days ago and asked for your questions, and I did not prepare for how many you had. And so what I'm trying to do today is to bucket them into some categories. And so I've got five areas that we're going to address, and I hope in doing that, I'll cover a large portion of your questions. I'll try to keep my answers tight, but I've never been accused of being short-winded. In this particular episode, I'll cover most of things related to exercise and what I'll call program design. So I'm going to start off with my take on how I'm thinking about training for longevity, lifespan, healthspan, strengthspan, powerspan, and things like that.

Dr. Andy Galpin
There was a lot of questions that I'll just categorize into that bucket. This will include, but is not limited to, things like grip strength and VO2 max, and then lots of other areas yet to be discussed. From there, we'll move on and talk more generally about the basics. And this is something that I've forgotten to really do enough of, and that is go back to the beginning and talk about what are the basics of exercise for muscle growth or hypertrophy, muscle strength, and fat loss, and how do I alter my training programs based on one of those goals or more of them. So in doing that, we'll cover the basics and the starting point on what you need to know for those outcomes. That'll roll perfectly into the third question, and that is what I call program design. And that's how I personally go about writing programs for people, how we pay attention to their goals, what do we pick first, whether that's the exercise choices, the repetition range, the intensity, and all that kind of stuff.

Dr. Andy Galpin
So my process, all the things I think about, and then the order in which I do them to build out my own training programs for myself, our clients, and our athletes. After that, we'll round things out with the discussion of functionality. There was a lot of questions about how do I get more functional, and which exercises are more functional than the other ones, and how do I move

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better and things like that. So I'll just bucket that into the function bucket, if you will. And then lastly, we'll talk about artificial intelligence. I have had a huge number of questions about how we're using it. Is it okay? Is it bad? And so I'd like to answer as many of those questions as I can. So that all said, let's go ahead and get started by talking about longevity, healthspan, and how we think about exercise and training for that. We're going to start with longevity. Now, this is obviously of interest to all of us.

Dr. Andy Galpin
We all want to live a long life, a healthy life, and a high-performing life, whether we play sports or not. And I think the best way I can describe my philosophy or point of view with longevity in terms of exercise is the following. You want to actually think about outcomes. What are we trying to optimize for? And that will then help us walk backwards into how we set up our training programs. To me, when I think of longevity, we want to, of course, live a long life. That's great. But then past that, we also want to be resilient. And that word is important to me because as I think about my own aging, I want to be able to do the activities I want and not feel hyper-restrictive or restricted rather, and at the same time, also not feeling in danger. So I want to be able to do something new. I want to be able to play a game of tennis if I'm not used to it and then not be incredibly sore at a really high risk of injury.

Dr. Andy Galpin
That is really all it comes down to. I don't want to be at risk of dying early because of some physiological limiter, and then I want to be able to do what I want within reason. So if that is our actual goal, we can start going backwards and saying, "Okay, well then what are the different physiological skills or attributes I need to have to be able to execute on that?" And so you immediately start thinking of things like you need what we'll call tissue tolerance. So your Achilles and your back and your neck and your adductors and all different parts of your body need to be functional. They need to be able to handle stressors. The antithesis of this would be something like, say you choose one mode of exercise, cycling only, or bench press only, or even lifting weights only. That's great, but then what happens if you ask that muscle to do something fast when it's never done that, or load it really heavy, or in a different range of motion?

Dr. Andy Galpin
Well, now we're not necessarily resilient against those things because we haven't practiced them in years or decades. And so ultimately what I'm saying here is you want a wide variety of movement skills, of training styles, of range of motion, of speed, and all the other things I laid out. That's truly at the core of longevity. And so I think you should be setting yourself up and thinking about your training on the months and years rather than individual workout programs. And you should be thinking about, can I get all of my joints moving through all of its range of motions? Can I be doing, as I've alluded to earlier, some things fast, when appropriate, of

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course, and some things slow? Can I work on building a good amount of muscle? Can I work on building a good amount of strength? Can I work on a good range of motion? Can I work on balance? Can I work on proprioception? And you just really start to paint the picture here of saying, "Well, I just really want you to be well-rounded."

Dr. Andy Galpin
That's the top of our pyramid. That's really what we're going after. Rather, I should say that's the base of our pyramid. When you start to get below that, now you can start looking into things like the research. And I'm bringing this up as a lower tier because as much as I have been as guilty of this as anybody else of saying things like VO2 max are critical to longevity, and leg strength, and grip strength, it's true But where we're failing in this conversation is thinking that those are the most important or only things that you need for longevity. The reality of it is there is a ton of research on all three of those and more. Foot speed, power, balance, these are all highly related to both long lifespan and wellness span. But it's not that simple. In fact, those are just proxies. I'll get into more of that detail in one second, but what I mean by proxies is those measures are not inherently that special.

Dr. Andy Galpin
They're only special and well-documented in the research because they are easy to measure in a laboratory. They predict functional outcomes, human movement, human capacity. So they're really awesome, but let's not lose the forest through the trees. The only reason we don't see things like single-leg squat strength as a major predictor of longevity is we just don't have buckets of research on it. But I think you'd be a little bit crazy to think that it wouldn't show up if it had an equal amount of exposure in large databases. But that's not scientifically realistic. So we do want to be grounded in the scientific evidence, and we are, but we also, again, maybe the phrase I'll just keep saying is we don't want to lose the forest through the trees there, meaning we don't want to all of a sudden turn all of our longevity programs into only grip strength training and VO2 max training and thinking we're optimizing for human capacity and resilience, because we're probably leaving a lot of attributes on the table by doing so.

Dr. Andy Galpin
I would be remiss to not bring up a few more points on this, since we're here, and I got into it. When we think about things like VO2 max and grip strength, people will say grip strength in particular is actually not that relevant or real. It's mostly a proxy for overall health, or it's a proxy for general strength. Now, all three of these things are true, and they're also false. So yes, on an average, grab any person off the street, their grip strength will be a solid proxy for their overall health. True. It'll also be a solid proxy for their overall strength. Very true. It's also true in and of itself, it is an important direct measure. Your hands are how you interact and interface with the world, and if you lose capacity there, you will change behaviors, and we've seen this illustrated

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quite clearly. So it is true that if you're only focusing all your training on grip strength because you want to go from the 80th percentile in grip strength to 90th percentile, I don't think you're living a day longer by doing that.

Dr. Andy Galpin
But if you are low, say, we'll just call it sub 30th percentile, and you increase your grip strength, I think this will have an absolute difference-making ability in your quality of life. So we can hold both of these things true. It is a proxy. It is also something you should directly be training when appropriate. I hope that distinction made sense. I could go on and on with it, but I'm going to stop from there. I can say a similar thing with VO2 max. If you start taking the data on VO2 max and you start pulling out things like metabolic health, body composition, sleep, other markers of health, then VO2 becomes less of a predictor of longevity than we would previously think, meaning VO2 is also oftentimes just a proxy for good health. So there's some wash there, but just like we saw with grip strength, your ability to use oxygen and bring it in and metabolize carbohydrates and fat for fuel and produce functional outcomes like movement is real in and of itself.

Dr. Andy Galpin
So I think the best way to think about these are on a spectrum. If you are low or poor in any of these metrics, directly training them probably improves your quality of life and length of life. But if you're kind of good, going from good to great or great to elite may or may not do much of anything. Now, I'm here for it. I love it. I'm all about it. I will never complain if somebody wants to bolster their grip strength, their leg strength or anything. But at the same time, if that's our only or central focus for the pure sake of longevity, then I think we've missed the mark just a touch. The world will probably hate me for all those comments, and I'm having to fight all my instincts to give you 20 or 30 more minutes of elaboration on all this, but I'll stop for now and say that's really what we're after. So I'll summarize my answer for the sake of longevity. From an exercise training perspective, I think you should be as well-rounded as you can.

Dr. Andy Galpin
You should be thinking of every human's movement capacity, meaning you should have balance and mobility, and you should have a little bit of speed and some power, and you should be able to move dynamically and not just in the frontal plane and sagittal plane and transverse plane, and not just being restricted to certain types of movements. You should have some muscle mass. You should have some strength. You should have some muscular endurance. You should have aerobic capacity, and you should have a long duration ability, meaning you should be able to walk for hours at a time or stand or do low levels of physical activity and take the stairs and things like that. So if we were to chop this whole thing up, to me, that's the type of program I'd put together if longevity or general health is your primary outcome. The presenting sponsor of

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Dr. Andy Galpin
Every single one of Momentous' products is third-party tested to ensure quality, and many are even NSF certified for sport. While I love all their products, I'm really loving their new creatine powder, which is called Signature Spec Creatine. I've long talked about the benefits of creatine for everything from helping to increase strength gains to the benefits it has with brain health. It is one of the most researched supplements in the world and has demonstrated benefits, which is why I make sure to take at least seven to 10 grams a day. This new Signature Spec Creatine from Momentous is the highest quality creatine to date, with 10X fewer impurities and two to five times stricter heavy metal limits than any other premium creatine on the market. All of this is backed by the six stages of testing and certification. My favorite part is that the creatine is ultra-finely blended or micronized, which allows for it to dissolve rapidly and easily mix into water or whatever liquid I'm pouring it into.

Dr. Andy Galpin
If you'd like to try this new creatine or any of Momentous' best-in-class supplements Just go to livemomentous.com/galpin and use the code Galpin for up to 35% off your first order. Again, that's livemomentous.com/galpin and use the code Galpin for up to 35% off your first order. Okay, I know I got a little bit long on that one, but that was an important and large topic, and one that was probably the most common question I got, so I wanted to spend a little more time there. Moving on to the second one, which is another really common set of questions was, give me the quick overview of training and lifting for building muscle versus strength versus fat loss. And I thought this was really interesting because as someone who's been teaching in this field for almost 15 years now, sometimes I do a poor job myself of reminding myself that not everyone was here on day one. So I'm oftentimes thinking about the student who's been here three or four or five years, or you're now five or 15 or 20 episodes of Perform in, and it's nice to go back and say, "Okay, what about if you missed all the first episodes?

Dr. Andy Galpin
How do we start?"

Dr. Andy Galpin
So here's how we think about it. Conceptually, I could give you a million examples, and I will give you specific numbers in one second. But I'm always hesitant to do so because all you have to really understand are what we're trying to do physiologically, and then that'll let you know you have millions of options. Methods are many, concepts are few. As long as you're getting the right concepts for hypertrophy or strength or fat loss, you'll get there. And then I could give you, in fact, I could do an entire podcast series on just the different methods for each one of these

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outcomes. So I'll give you a couple to get you started, but conceptually, we'll start off with muscle growth.

Dr. Andy Galpin
All we're trying to do is increase muscle size here. What this generally takes is what's called mechanical tension, and this is primarily driven by volume. If I just lost you on jargon there, you need to put some sort of load on the muscle, and you got to do it kind of often. I will dumb this down sometimes to what I call the 72-hour rule, meaning every 72 hours or so, try to put a stimulus on the muscle you want to grow.

Dr. Andy Galpin
Right now, some training protocols will break that rule, but we can get to rule-breaking later. Let's just start with learning the rules first before we worry about all the exceptions. So 72 hours might mean something like, oh, you could do body part split training, where you train arms one day and then back another day and quads another day, and that's just a different way to get to 72 hours. Or you could do whole body every day and train every third day. So those types of things, those are methods. Those are different methods, but what you'll see consistently among all those effective programs, most of the time, every 72 hours or so, they're trying to get your muscle to work a little bit. And more recently, the research has been really clear here. Mechanical tension tends to be the driver. That is heavy-ish lifting weights. You can go on the heavier side of the spectrum if you'd like, if that's your preference.

Dr. Andy Galpin
This might look like something where it's as heavy as you can go for as low as five repetitions per set. Or it could go the other end of the direction, which is light and a lot of repetitions. In fact, there's excellent research showing even up to 30 repetitions per set can give you equal muscle growth as five to six repetitions per set. Plenty of studies on this. So what that should tell you is it's not about the repetitions per set, it's about some underlying physiological principle, and that I'll keep stating is what's called mechanical tension.

Dr. Andy Galpin
So if you like to go to the gym often and you want to use a routine that requires you to be in there five or six days a week, great. If you're the person who goes, "I got two days a week to lift," awesome. We could do it differently. If you want to be in there every single day, then maybe think about something like, again, what I'll call a body part split. So one day for your shoulders, the next day for your calves, the next day for your hamstring. You get the point.

Dr. Andy Galpin
In those days, you're going to do more focused work, and you're probably going to lift harder. Amazing. But you're going to put more time in there. If you're the opposite and you're like, "I

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want to get some muscle growth, and I got two days a week," then I would recommend a more full-body routine, so that even if you're lifting, say, Monday and Thursday or Tuesday and Saturday or whatever you're going to do, every 72 hours, every muscle or most of them get some sort of mechanical tension placed on it. If you want to use barbells, great. Dumbbells, amazing. Your body weight, fine. Bands, machines, kettlebells, all of it is fine. They're just different ways to put tension on the tissue. They're not all exactly the same. Again, that's level three, four, five, six. But at the core, the reason they all do work, and there are plenty of randomized control trials and other types of research on these, and they all show that they work, it's because they're fundamentally getting to the same stimuli in the tissue.

Dr. Andy Galpin
How heavy do you lift? Well, we kind of already answered that. You can go light. You can go heavy. How much rest do I take in between sets? You can do either. If you rest a small amount of time, then you'll have to go lighter. That's fine. You can rest a lot, say two, three, four minutes in between. This allows you to recover a lot. In fact, more recent research suggests this is potentially even better, but either one is fine. But that allows you to go heavier or lift more often. So we've kind of covered that. We've covered exercise choice, which is, do I do machines or barbells or free weights? Do I do isolation work? All of it's fine. All of it is possible.

Dr. Andy Galpin
When we would differentiate these are when we have more specific information about you. Again, how many days do you want to be in the gym? Is it a particular body part you want to have larger? Do you have any injuries? What's your history? What exercise equipment do you have available? And all that other stuff we can get to later. Other things we think about here are, do I emphasize the eccentric portion? Do I go slow with my repetitions or do I go fast? And guess what? All of them work. One other kind of consistent theme here is, though, you have to try hard. Sounds sort of funny, but what I mean by that is, as long as you reach pretty close to failure, then it's fine. In fact, more recent research indicates you don't have to go all the way to failure. Most people are going to say something like within one to three repetitions to failure, at least by your last set. So if you feel like you could've got one more rep done, but that's it, you're probably in a good spot.

Dr. Andy Galpin
If you feel like you could've done five or six or eight more reps, that's probably not enough tension to drive a ton of hypertrophy. So hopefully, I've answered a lot of the variables. If you're thinking about your program, and you're like, "Man, I'm trying to gain muscle." If you're checking all those boxes, then you're probably in a good spot. If you're not growing, then we would need to think about other things like, are you being consistent enough? Are you progressively overloading? Are you sleeping, eating? And all the other variables that go into it. Now, with

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progressive overload specifically, all we're referring to here is some sort of increased stimuli, meaning you could get this by adding a little bit of weight or what we would call load. So the next time you come into the gym, you add a couple of more pounds. That's the easiest one to describe, but it's honestly not super realistic.

Dr. Andy Galpin
It's quite difficult to just continue to add load. It only lasts four or five weeks, then eventually, you just can't keep adding load. So the more common ways are to progress with something like adding a few more repetitions per set. So you go to the gym, and you pick a certain weight. Last time you did 50 pounds for this given exercise, and you did it for eight repetitions. And now this week, you try to get it to nine repetitions. And then the next week, 10, 11, so forth. Again, you're going to hit a limit there at some point, but that's another style or option. You could add more sets. So you did two sets this week of that exercise, now you do three sets next week. You could do a combination. You could add a little bit of load and a little bit of reps, or a little bit of reps and a set. You get the point here. All of these represent progressive overload. You can increase the range of motion that you're using.

Dr. Andy Galpin
You can increase the frequency, so you train that muscle three times in a week instead of twice in a week, and there's lots and lots of ways you can progress. There are some nuances within it, of course, but at some level, you have to add insult, you have to add challenge, or hypertrophy will be limited most of the time. So do whatever's best for you. I would honestly recommend a combination. One of the major reasons people get plateaued or don't see any progress, in fact, I'd probably say the single largest reason for that is they don't have any sort of structured progressive overload. This is where you'll see a significant difference between making up your workouts as you go and having a plan. Even if that plan is not great, when you have a plan in place, you will see more results, period. It's easier to track, it's easier to monitor, and you can make very simple things like, okay, did I do a little more work this week than I did last week?

Dr. Andy Galpin
And realistically, even colloquially here, I often say week by week, but that's not realistic. Even if you progress every two weeks or every three weeks, that's still fine. That may be more realistic. You don't necessarily have to literally try to get better every single time or to lift more load or more repetitions every single week. Again, that will last for a few weeks, few months at most, and then you'll not be able to progress anymore. So just think of it conceptually. What did I do last time? Try to match that or do a little bit better one way or the other, and that would represent your progressive overload. Now that we understand the basics of hypertrophy, we can extend now that and walk it into strength. Because the primary driver of muscle growth is that tension, it's non-specific, meaning it's not a skill we're trying to develop. It is just a physical attribute. It is

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total amount of muscle mass and size.

Dr. Andy Galpin
Strength is a skill, meaning there's a lot of overlap between the two, and especially if you're new to training or even in the moderate level of training, strength and hypertrophy will basically be one to one, meaning there'll be a huge overlap. What you do for strength will make you increase muscle size. What you do to increase muscle size will help you get stronger. So if that's the part of your journey you're in or the people you're working with, you don't even necessarily have to pull these apart. You can treat them the same. For a lot of people, they actually just want a little bit of both. I want to add some muscle and get stronger, then it's like, great. We're done. Just use all the stuff I just talked about and you'll probably get both. Where we need to pull this apart a little bit now is if somebody really specifically wants to get stronger and/or maybe doesn't want to gain too much muscle.

Dr. Andy Galpin
So the common thing here is I can't afford to add more muscle because maybe I'm an athlete and I compete in a weight category, or simply people that have aesthetic goals where they don't want to add muscle to a certain area for whatever reason. Now we need to start thinking about strength as a skill.

Dr. Andy Galpin
That is an important distinction because if I were to bring it to something like hitting a golf ball, you would say, okay, that is an actual neurological skill. My timing needs to be correct, and my body parts need to be organized in the right position, and there's so many things that go into it to hit the ball 300 yards. Well, if I just change out hit the ball 300 yards to squat 300 pounds, you'll actually realize that's very equivalent. So your ability to get stronger is not only determined by your muscle size, just like your ability to hit a golf ball isn't only determined by your muscle size. It's a part of the equation. Typically, people with more muscle are going to be stronger, typically, but not exclusively and not always, because there's a skill component to it. And I won't extend the analogy to golf anymore, but I hope you get what I'm picking up here. You can get stronger by just working on skill, just like you can hit a ball farther by just working on skill and not only just adding muscle mass.

Dr. Andy Galpin
So if there is a particular exercise you want to get stronger at, then just get really good at your technique. Make sure you're getting advice from somebody or working with a coach who knows how to do a really good technical squat or deadlift or whatever exercise you're most interested in. You can see tremendous progress. In fact, we've seen people literally double or more their strength without really adding much muscle because they just got better at the skill. It's just technique. You can also simply work on training at a higher load or lifting heavier with less

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volume. So there is not enough volume, repetitions, and sets and things like that to drive a ton of muscle growth, but there's enough to drive the skill component of it up. Because it is more skill-based, we tend to think about it as something you'll do more frequently than muscle growth. So you remember the 72-hour rule I said for hypertrophy?

Dr. Andy Galpin
That's not true for strength. Just like you wouldn't say, "Oh yeah, only hit a golf ball every three days." No way. Practice it often, right? Same for strength. You need to be fully recovered and all that, but since you're not putting high loads and high volume on a muscle, it's quite low volume, you can do it pretty frequently. Doesn't mean you're going to go all the way up to your one-repetition max every time, but you can train sub-maximally and just work on technique a lot, even at fairly heavy loads. So it's different in that sense, and that's why I draw that distinction, is because it allows you to go more frequently. One of the rules that we use quite often with strength, and this is also true for speed and power by the way, is the old adage of what I call three by five. So three by five rule, I did not make it up. It's funny, every time I talk about this, someone goes, "Oh, so-and-so made that up."

Dr. Andy Galpin
And I'm like, "Nope, you got to go back 80 years." It's been around for a really, really long time, and there's different variations of it. But three to five is just a rough heuristic that says, okay, somewhere between three to five days per week, pick three to five exercises, do three to five sets of three to five reps per set, as heavy as you can or reasonably close, and rest three to five minutes between each set. If you do that, that allows you to do something as small as three days a week. You do three exercises, three sets of three, and you take a five-minute break or a three-minute break. That's a 20-minute workout. If you do those heavy, that can be a very good stimulator of strength. You can get really, really, really strong like that.

Dr. Andy Galpin
Or you could go buck wild the other end of that spectrum and go five days a week, five exercises, five sets of five, and just bury yourself. That's going to be a really challenging program if you're lifting with any amount of weight. Really, if you're pushing it, that's going to be super hard and probably not advisable, and if it is, not for very long. But most people are going to pick something in the middle. That's why I like the three to five. It gets you roughly close to what you need to do to get faster, more powerful, and stronger. Hopefully, that allows you to start running your own compare and contrast between hypertrophy and strength. And if you extend that logic, we start to think about some of the other questions like, okay, what's this mean for exercise selection? Well, you probably don't select very many single-joint exercises for strength. You can, but it's really hard to do a set of three with a biceps curl.

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Dr. Andy Galpin
It's just not that common of a thing to do. You're more likely to select multi-joint exercises, bigger exercises. You're probably more likely to select machines, which are totally fine for strength, barbells, dumbbells, kettlebells, and you're probably not as likely to be able to get away with things like body weight. Doesn't mean you can't. Plenty of circumstances you can, but you get the point here. You start to get limited with how much you can load it and the movement patterns. But if you contrast that to hypertrophy, you can do single-joint exercises for hypertrophy all day. You can do muscle isolations. You can do smaller movements, and you can use light bands and do different things like that, where at some point when we get into strength, we start to lose the realistic ability, not the absolute or literal ability, but the realistic ability to use some of those tools. So now it comes down to less about what is impossible and more like, again, what is practical, what's going to be true for most people.

Dr. Andy Galpin
And so strength probably falls more into that traditional resistance exercise, weightlifting, weight training umbrella, where hypertrophy can really be done with just push-ups, sit-ups, and things like that if you wanted to. So pretty good distinction there. Hopefully, that helps think about your options. The last part here we'll discuss is fat loss, and this is the easiest of all of them because now all we're looking at is effectively caloric expenditure. And so now it's not about specificity. It's not a skill. It's not even requiring one major stimuli like mechanical tension. If you like to use strength training, great. If you hate strength training, fine. If you want to use long duration, low intensity, you want to do group classes, you want to do it in your home, you want to do it with sports or activity, all of it works. All we really care about here is can you pick something that's going to keep you healthy so you can keep doing it?

Dr. Andy Galpin
Consistency and adherence are the number one predictors of exercise success for fat loss. And in fact, a meta-analysis was just published in the last month showing really clear evidence that strength training specifically doesn't necessarily aid in fat loss, but it is really effective at maintaining fat loss. So you don't have to have it to lose fat, but it's super helpful in keeping that fat off in the long term. So much like we simplified hypertrophy and said, "All right, at the highest level, just try to work your muscle every 72 hours." And we simplified strength by saying, three to five rule. A quick little tool you can use for fat loss is what I call a five, four, three, two, one, and that is five days a week, try to be active. I'd like you to be active six or seven, but give me five. Four days a week, try to actually work out. Now, these are not the same thing. Active can just be standing desk, it can be walking more, escalator versus stairs, things like that.

Dr. Andy Galpin
Four days a week is actually working out. You need to put the gym clothes on, you need to get

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moving and really do some sort of formal exercise. Three is heavy sweat. Now, just because you sweat more doesn't mean your workout was any better or more effective, especially if you're trying to train for strength or speed or skill or something else. So my point here is not to get you to sweat. That needs to be super clear. But the reason I do like saying, "Hey, a rule of having three days a week where you have a good sweat" is you should be working out hard enough to where you sweat a good amount, three times a week. That's the only crude metric we're trying to go after here. This eliminates things like walking and gardening and stuff like that. That's great. We already tackled that in being physically active and moving, though. You need, ideally, at least three days a week where you're actually truly working out.

Dr. Andy Galpin
I hope that distinction made sense. So five days a week, be active. Four days a week, have structured exercise. Three days a week, make sure that exercise is hard enough to where you're getting a good sweat in. Two days a week, I want you working out really hard. Really hard. If this means intervals, if this means maximum heart rate or zone four or five, I don't care. However you're defining hard. If this is with weights or this is any other way, I want you training really hard where you're like, "Oh my gosh, I am pooped" at the end of that thing.

Dr. Andy Galpin
What this allows you to do is scale these things up if you'd like or scale them down, but I'll reiterate, you can lose tons of weight just walking. But what we want to do is try to get a blended program that's going to be as successful as possible, so I like at least two days a week where you're working pretty hard. And then finally, one day a week, something where you're doing something long. So this is going to cover your bases of your lower intensity, zone zero, one, two, whatever you need. This could be your output over time, your cardiovascular system, your endurance, and all that. And if you look at successful fat loss programs, they probably fall into the five, four, three, two, one category at the highest level, and then they can look like a billion different methods within that, but hopefully, the five, four, three, two, one rule helps you a little bit to understand, as long as you're that or pretty close, your fat loss program's got a good chance to be successful.

Dr. Andy Galpin
So you have tons and tons of ways you can go about it. Just pick the ones that'll keep you the healthiest, trying the hardest, having the most fun, most consistent, and you can choose anything under your umbrella. As I mentioned, group activity classes, bands, barbells, spin class, high intensity, low intensity, walking, hiking, rucking. All of it is great. I would probably, if possible, recommend a balance. I would do some low intensity, longer duration stuff, hike, ruck, sports, surf, skateboard, whatever. I would pick something that's a higher intensity, your group activity class, your sprints, pushing a sled, jujitsu class, cardio kickboxing, whatever. I'd pick

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something that's along the strength training realm, even if that's a Pilates class or something that involves some sort of overload. And if you got something from all three of those buckets, at least once a week, then I'd fill in whatever other time you got with your personal preference.

Dr. Andy Galpin
But that puts most people in a really good spot. Today's episode is sponsored by David. David makes protein bars unlike any I have ever encountered. They have an amazing 28 grams of protein, only 150 calories, and zero grams of sugar. That's right, 28 grams of protein and 75% of its calories come from that protein. This is 50% higher than the next closest protein bar. Honestly, it's the best-tasting bar I've ever had in my life by a mile. And their newest bar, the David Bronze bar, tastes incredible as well. While I often talk about the importance of getting one gram of protein per pound of body weight for things like muscle health and recovery and the promotion of lean body mass and satiety, the reality of that is, for most people, getting that one gram of protein per pound of body weight is really challenging. However, David makes that easy. Their bars taste incredible. The Gold bar is packed with 28 grams of protein with just 150 calories, and the Bronze bar has 20 grams of protein, also with just 150 calories.

Dr. Andy Galpin
I eat one almost every single day and always have two or three with me in my backpack when I'm traveling, and I literally mean always. It probably sounds funny, but I eat them as dessert all the time. When you try them, you'll know exactly what I mean. If you're interested in trying these bars for yourself, you can go to davidprotein.com/perform. Again, that's davidprotein.com/perform. Our third question for the day is what we call program design. And I've already touched on a lot of these terms so far in our first two answers, but maybe we'll call them out directly now. Program design is the way that we intentionally manipulate what are called the modifiable variables to get an outcome. That's science talk for, well, what kind of lifting do I do if I want to gain muscle but I don't care about strength? Or what type of exercise, or how heavy should I lift, or how often should I rest if I want this outcome and this outcome, but not that outcome?

Dr. Andy Galpin
I got a lot of questions about things like hybrid training. I want a little bit of strength and a little bit of endurance. Great. All these are program design questions. Methods are many, concepts are few. So here are the variables you should be thinking about, and if you're selecting these things even close to appropriate, your program will work. If you're training hard or even kind of hard and consistently, but you're not getting the outcome you want, or you're getting outcomes you don't want, it's because you made a mistake with these modifiable variables, almost guaranteed. So here you go. The very first one, and when I design programs, by the way, this is exactly the order I do them in. My first step is identifying frequency. This is how many days per week do I have to

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work out. I don't start selecting exercises. I don't pick my zones or my heart rates or any of that stuff before I identified what is realistic with this person based on their lifestyle, goals, backgrounds, and so forth.

Dr. Andy Galpin
I can't do anything with my program design selection if I don't know if you can train five days a week, two days a week, one day a week, or somehow you got the ability to train 20 days in a week. I'm half joking there, but in reality, many of our athletes will train multiple times a day. So we actually do get to plan the 15 to 20 training sessions per week. So frequency is number one. Quick rule of thumb here, just having coached hundreds of people, whatever your answer is, cut one day off that and go with that number. So if you tell me five, then program it for four. And great, if you got the fifth day, bonus. You can go do a whole day of bicep curls or calf raises or whatever you want to do there because you don't want the inverse. I'm half joking, but I'm also not joking at all. It's worse for you to have a program based on, say, four days a week, and you're consistently missing one of those days, whether that day is the same day you're always missing Mondays, are always a problem, or if it's always leg day or always interval day.

Dr. Andy Galpin
You don't want that consistent problem. I'd rather go the inverse. So take whatever day you feel like is realistic, cut it by one, and then build your program based on that. Once I know how many days a week you can train, then I'm going to start selecting the exercises. This is called exercise choice, and this is when we get into some of the variables we've discussed. Are we using machines or body weight or bands or a bike? Are we doing indoor, outdoors? Are we playing sports? Are we doing only structured exercise? Are we blending in physical activity? What are we doing here? And when you select that, I'm thinking about number one, what's the goal? Exercises themselves do not determine the adaptation. So a box jump doesn't make you more powerful. A back squat doesn't make you grow muscle. Running doesn't improve your endurance.

Dr. Andy Galpin
Exercises do not determine adaptations. How you execute that exercise determines the adaptation. I can't tell you how many times people have done back squats or deadlifts or hip thrusts and then gone, "Oh, I was trying to grow my glutes and it didn't work." Or, "I'm trying to get bigger shoulders and this bench pressing isn't working, or these overhead presses aren't working," or fill in the blanks. Because the exercises don't determine the adaptation. Your technique, your range of motion, how many reps you're doing, all the other modifiable variables are what determine whether or not you got big or fast or better range of motion or more flexibility or whatever the case is. What you do choose exercises based on are things like what is your joint health? What do you have access to? What's realistic for you? What do you personally not

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like? What hurts your wrist? What makes your knee angry?

Dr. Andy Galpin
What muscles are we trying to target? What range of motion do we want to be in? Those are the types of things we should consider when we're choosing our exercises, not the outcome per se. I will undercut myself here by saying there are some exercises that are generally not good for some adaptations and are generally much better for others. Some easy examples.

Dr. Andy Galpin
Deadlifts are probably not very good for speed.

Dr. Andy Galpin
You can technically do them, but you're more likely to bang your shin or hit your knee than you are to get fast with them. So it's just not a great exercise selection for speed, but it might be fine for hypertrophy, low back health, and a million other things. We could play the inverse game. Getting on a rower or a SkiErg are probably awesome for many things, but maybe not the best thing ever for hypertrophy. So you can have a little bit more nuance with this, but what I want to express right now is just this top overall point. I don't want you going to the gym and saying, "Oh, I'm trying to grow X muscle, therefore, I have to use this exercise." Because it's just fundamentally not true.

Dr. Andy Galpin
So hopefully that helps you understand a little bit more about exercise selection. When you do that, though, you do want to pay close attention to what we'll call balance. Now, in a previous episode of Perform, which we'll link to in the show notes, we talked at length about asymmetries and imbalances And so you can see all the details there. But just for now, just make sure your exercise selection isn't putting you in a bad spot. So this could look something like only choosing exercises that are upper body pressing movements, like a bench press, and no pulling movements like a row. So that itself can be a mistake that can happen with just selecting your exercises. Okay? See that other episode for more detail.

Dr. Andy Galpin
After that is called exercise order, which is as simple as it sounds. Which one do you do first, second, third, fourth, and fifth? Probably the most common question we got related to exercise order is, if I'm doing cardio and weights in the same day, which do I do first? The answer is, you can do either one. Do what is most important to you first. If you're primarily there because you want to make sure you get your cardio in, do it first, and then you try to get a lift in afterwards, great. If you're there to try to get strong and you're doing your cardio first and then your legs are tired, and you're trying to get strong in your legs, well, then you've undercut your own goals. And since we discussed earlier what it takes to get stronger, skill, hard to develop skill when you're

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tired. You want to pay attention to things like that. What is my primary goal? What am I most concerned with? General rule of thumb is do that first.

Dr. Andy Galpin
But you want to do your big muscles first? Cool. Smaller muscles later? All right. You like to use what some people call pre-fatigue or pre-exhaustion, which is maybe you'll do a bunch of biceps work before you do your pulling exercises to fatigue your biceps, so you can really train your upper back when you're pulling movement. Okay, that works. You can do a bunch of leg extensions prior to squatting if you're trying to pre-fatigue your quads. Plenty of research on that. Plenty of people have been doing it in the field for decades. So we have practical evidence that it works. You have coaching evidence it works. You have scientific evidence it works. Or you could say the opposite. I'm not trying to isolate my quads. I'm trying to just get stronger, or I'm trying to get some other outcome, and therefore, you would focus on the big movement first and do the isolation work at the end. All of these are possible.

Dr. Andy Galpin
So hopefully what you're seeing here is these are not so much as hard and fast rules as they are options that depend on your context, nuance, and goals. So how many days a week are we working? What exercises are we picking? What order are we doing them in? And then we pick what's called the intensity.

Dr. Andy Galpin
In the gym, this is typically defined as what percentage of your one repetition max, or what percentage of your maximal effort. If you're on the track, this might be represented as your percentage of your max speed. Could be percentage of your heart rate reserve or your VO2 max. It's just some way of trying to determine load or intensity, like how hard are you working in that context. So I'll reiterate, depending on what you're looking at, this could look a little bit different, but I'll pick it at this stage because now just think about this practically. I know how many days a week I'm doing my work. I know what exercises I'm doing.

Dr. Andy Galpin
I know what order I'm going to do them in, and now I can start to go, okay, this one's going to be really hard, and then I'm going to go a little bit lighter on this one. This one will be a little bit easier and so forth.

Dr. Andy Galpin
After that, then you can pick what's called your volume because your intensity will determine your volume anyways. If you want Wednesdays to be a max-out day and you're on the track running as hard as you can, well, you probably can't do your highest volume that day either because you're going to be tired. So that's when I say the intensity or the load will determine the

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volume, that's why. If you want to be lifting at 90+% of your max, you're not going to be doing 12 repetitions per set. So volume is in large part determined by load anyways, which makes these numbers easy to fill in. You've got that down, then you're going to select what's called your rest intervals. So this is the time you're taking in between. Are you doing a one-to-one track workout where you're going to run 800 meters, take that time, say it takes you three minutes to do that 800 meters, and then you're going to rest for three minutes, and then you're going to do four or five of those.

Dr. Andy Galpin
Be a tough workout, but a great one if you're looking for a workout to do, by the way. Just ask any runner or cyclist or swimmer, one-mile repeats or whatever the distance is in their sport. It's a brutal thing to do, but it's super effective, right? Great. That's awesome. If you want to do something different and you go shorter rest intervals or longer rest intervals, what you're trading off is volume for intensity. That's the game you're playing. The shorter your rest always, the more fatigue accumulation, the less work you can do or the harder you can do it in. One of the two. The longer you rest, the opposite occurs. Doesn't always mean it's better.

Dr. Andy Galpin
Easy examples here would be if you're in a sport like wrestling and you know the work-to-rest ratio in your sport is oftentimes one-to-one or shorter, then you might want to practice 30 seconds of hard work with 15 or 20 seconds of recovery because you're never going to get a minute or two or three during your individual round or individual periods in the match. You get the point. So some sports and specific goals will determine the work-to-rest ratio. If you're thinking about this just from the context of fat loss, hey, do whatever one you want. Strength, longevity, do whatever one you want. I would probably just do a combination of all of them. There are different attributes, but they tend to be very specific past this kind of high level.

Dr. Andy Galpin
The rest intervals, though, tend to take care of themselves. The last thing you want to do, in my particular opinion here, is then try to predict problems. So once you've got this entire program down, then look at it and go, all right, where are we going to run into issues?

Dr. Andy Galpin
"Oh, maybe I'm being just unrealistic about my volume. Maybe I've got too many hard workouts where I might hold on for three or four weeks, but if my motivation wanes, this might be harder than I think. Maybe I've got too many exercises in a day. I've got too many lower body days."

Dr. Andy Galpin
Whatever the issue is, just think through the realistic scenario of your client or yourself and go, "You're going to run into problems, right? What's the most likely place?" And then fix it right now

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before you get three or four weeks in. So maybe you're like, "God, I just really hate these pelvic floor corrective exercises." But you know you do them because every time you don't, you hurt your groin or your back. All right. Go fix the problem now. How do you engineer the program so it's more realistic for you, so you just don't get three or four weeks in and realize you quit, and then five weeks after that, you get hurt?

Dr. Andy Galpin
So that's how I build programs. Hopefully, that helps you, whether you're putting these together for yourself or you just kind of like the stuff. But we've, at this point now, tackled how we think about training for longevity and health, some of the specific details about training for fat loss versus strength versus muscle growth, and then I layer that all on top of just how we build programs for people, which leaves us with our next question that we're going to go into, which is what I'm just going to call functional. And I got a lot of questions about this, like, "How do I build functional strength? I don't care about the weight room, but I want to be functional. How do I build functional mobility? How do I improve my movement skill?" And so that's what we're going to tackle next is building functional muscle and functional strength and functional performance. Today's episode is sponsored by LMNT.

Dr. Andy Galpin
LMNT is an electrolyte drink that has an ideal electrolyte ratio of sodium, potassium, and magnesium, but no sugar. Hydration is critical to performance, both physical and mental, and countless studies have shown that even a slight degree of dehydration, even as small as 1%, can lead to decreases in physical output and mental performance. We also know that electrolytes are critical to proper hydration, which I've been harping on for years. But you can't do that, proper hydration, by only drinking water, especially if you sweat a lot. You need to get the right amount of electrolytes in the right ratios, and that's why I'm a huge fan of LMNT. In fact, many of you might remember that I featured LMNT in my YouTube series on hydration nearly six years ago. I featured LMNT in these videos because their blend of 1,000 milligrams of sodium, 200 milligrams of potassium, and 60 milligrams of magnesium really is unique and different than any other electrolyte on the market, and it has great scientific support.

Dr. Andy Galpin
I use LMNT on nearly a daily basis, especially when I'm doing really hard training in the heat and I'm sweating a lot. If you'd like to try LMNT, you can go to drinkLMNT.com/perform to claim a free LMNT sample pack with the purchase of any LMNT drink mix. Again, that's drinkLMNT.com/perform to claim a free sample pack. Now, for any of you who were in the field 20 or more years ago, the term function would have caused all the controversy. It was a big issue for a long time. But for the most part, we've gotten past that. I say that with a thankful breath because it was quite frustrating. The term function doesn't really mean a lot. I understand

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what you're saying with it. I think I can help you get there. But in and of itself, we have to really have a conversation about language. If I wanted to be pedantic, I would say something like, "Well, tell me an exercise that doesn't have a function."

Dr. Andy Galpin
And you wouldn't be able to answer it because everything has a function. And so really, I think what people are trying to say when they ask this question is something like, "I don't want to just go to the gym and build muscle for the sake of muscle. I don't want to be strong in some specific area that doesn't transfer to my life." Totally get it. I actually feel the same way for the most part. So really what we say with function is, am I doing something with a specific purpose? And so I could argue, if you are a Major League Baseball player and you're a pitcher, then doing some really small forearm rotational exercise is highly functional. Hell, a biceps curl is functional. It's incredibly important to elbow integrity. If you're a person who's just simply trying to lose some weight or stay healthy, then I would say that same exact exercise is probably not very functional for you. It's just not the most important thing you can be doing.

Dr. Andy Galpin
So when we think about function, my first heuristic, or rubric I should say, is it serving what we're trying to accomplish? And that actually goes back to earlier in our answers in exercise selection.

Dr. Andy Galpin
What are we trying to get out of it, and is that the best exercise for that outcome? Another way we want to think about function is movement quality. And so kind of baked in here is the idea of going, well, I want this to result in me feeling more athletic, feeling more capable, and less likely to be injured.

Dr. Andy Galpin
So the way that I will typically judge movement quality is a combination of four things.

Dr. Andy Galpin
The first is range of motion. Most joints should be trained through most range of motion. Now, every person has a different range of motion, and every joint has a different range of motion. In fact, if you were to look at something like the shoulder, it has the ability to do all kinds of things. It can invert and evert. It can internally and externally rotate. It can flex, it can extend, it can do all kinds of things. While your knee basically flexes and extends. It can do a little bit of internal, external rotation, but a very small amount. And then it doesn't like to go into, in the case of the knee, it's not invert or evert, it's varus or valgus, if you know that technical thing. But you get the point. Some joints have a lot of degrees of freedom, and some are extremely restricted. In fact, if you look at the spine directly The cervical spine, the top by your neck, is meant to be really mobile.

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Dr. Andy Galpin
It's supposed to be able to turn your neck left and right and up and down and at weird angles. And then the one below that, your thoracic, so the middle chunk, is supposed to rotate left and right and do a little flexion and extension, but not as much. And then your lumbar spine has the least range of motion on purpose. It's meant to be stable. It's not supposed to be rotating a bunch. So when we lose control or capacity in one of those areas, we start running into problems or injuries. So when we say function, that's another way to think about this. Is the joint going through an appropriate range of motion that it's supposed to be? If your thoracic spine is really immobile or lacks flexibility, then that's not very functional. If your knee can't extend or flex the whole way, not functional. And then we just go through all the joints and think about them. Are they going through the right function?

Dr. Andy Galpin
And so making an exercise more functional doesn't mean it has more body parts, it doesn't mean it looks more like a sport, it doesn't mean that it looks more like your primary activity. So you don't have to have a football in your hand while you're doing your squats to make it more functional. That has nothing to do with it. And this is actually why you will do something like a trap bar deadlift, even if you're a swimmer. And you might look at that and go, "Well, there's no way that's transferring because I don't look like I'm swimming." Well, it is transferring because what's the point? If you're trying to get a stronger back, then there you go. If you're trying to get better at putting force into the ground, there you go. If you're trying to get better at strengthening your back shoulder, there's a million reasons why it could be functional, and there's a million reason why you could say we're trying to get a different attribute, therefore that trap bar deadlift is not functioning for this attribute in this swimmer.

Dr. Andy Galpin
I hope that made sense. So it's not the exercise per se, which is a thing we went on a few minutes ago about, but it is what's the outcome we're trying to get to? So range of motion is a primary way we're considering, was that movement quality done well? Well, the first thing is, is it going through the range of motion that that exercise is intended to go through?

Dr. Andy Galpin
Some are intentionally restricted, some are intentionally open. The second thing we're trying to pay attention to is stability. So are the joints moving when they're supposed to move and then not moving when they're not supposed to move? It's as simple as that. The third is symmetrical. Again, we discussed this at length several episodes ago. But symmetrical doesn't mean perfect on the same side, left and right, up and down, but within some realistic benchmarks of symmetry. Our fourth one then is simply awareness. And what I mean by that is, is it doing what it's supposed to be doing? Are you even aware that your elbow's way up high and the other one's

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way down low? Are you aware that this is happening when you run? Are you aware this is what you look like when you're swinging the racket? If you are going through a proper range of motion, if you have the appropriate symmetry, if it is stable and you're moving how you want to move, then to me, that's a high-quality movement.

Dr. Andy Galpin
A high-quality movement then is the most functional thing you can do. So it's impossible for me to give you specific examples because there's unlimited amounts of human movement. What we want to be avoiding are ideas that humans have only three or four or five ways to move, and that you always have to be in these perfect positions. That's not what I'm saying at all. I'm saying perfect is defined on what you're trying to do, simple as that. If you're trying to be in a different position because of a different output or a different demand, then you're doing it perfect. If you're not trying to be in that position, then maybe we have a conversation about, "Hey, you're in the wrong spot here." Now, within this, I want to cover a sub-question because another one came up a lot here regarding stretching and flexibility. And I've kind of answered this already, but there was actually a meta-analysis just published recently as well on this topic, but heavy strength training is remarkably good at improving range of motion.

Dr. Andy Galpin
You can static stretch if you'd like. That's fine too. But for my money, full range of motion strength training nails it. There's also a lot of research and growing steam on something called lengthened partials. This is a strength training tactic in which you're emphasizing lifting at the fullest range of motion. The recent research indicates not only is it as effective, but it's even potentially superior for stimulating muscle growth. Now we've known for quite some time that heavy load over the stretched position is great for, like I just said, flexibility and range of motion. But given now that it is equal if not even superior for flexibility, further highlights what I've been saying for a long time now, and that is, by default, you want to be trying to train your joints over a large range of motion because now you're going to get muscle growth, muscle strength, connective tissue health, and range of motion.

Dr. Andy Galpin
Just to make sure we're on the same page when I say lengthened partial, I'll give you an example. It's very common in the hypertrophy or physique world to not extend all the way in your joints when you lift. I'll just give you an example. Say you're doing an overhead press with a dumbbell. Maybe you lift that dumbbell all the way up in the air, and right before you lock your arms and shoulder out entirely, you stop, and then you come back down. So these are partial range of motion because you're not locking out at the top. Now whether you choose to lock out at the top, separate conversation. What we're saying at here is not that part of the range of motion. The opposite, which is when you're lowering it down, making sure you come all the way

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down to the very bottom while you're still in good position because that puts your shoulder and triceps on the largest stretch. So you're loading it heavy while it's being stretched, and then you're contracting That's the part of the range of motion that matters.

Dr. Andy Galpin
So not the end or locking out, but the inverse portion of it. It's being really stretched and causing contraction over there. So a lengthened partial is when you emphasize that range of the motion and then almost kind of do whatever you want towards the top end, only go halfway, that's the partial part of the lengthened partial, and that's fine. And again, plenty of muscle growth that happens with that. If you do that appropriately, the range of motion will jump off the charts. If you don't like lifting weights or you can't, or for whatever other reason that's not on the table, there was actually two papers published just this week on the psychological benefits with things like HRV, mood, and anxiety with static stretching. It's very clear, stretching is relaxing. It puts people in a better mood. In here, I'm talking static stretching. So I don't think we need to necessarily throw static stretching out either.

Dr. Andy Galpin
This is sitting and stretching your hamstrings for two minutes or 30 seconds. This is while you're sitting in the sauna or the hot tub, stretching your arm or quads or whatever you're doing. This is Kelly Starrett 2010 couch stretch. These are great, totally fine. You want to make sure we're probably not doing a ton of static stretching right before we're exercising. It can decrease performance if you're optimizing for performance. But that said, if you lack a lot of range of motion and you lack a lot of mobility, doing some stretching before you go lift, if that helps you get into better positions, and then you can train in a fuller range of motion, you're probably winning there. So, as always, context and nuance matters with something like stretching, with something like functional, with something that's going to transfer more. And I hope I gave you a lot of ammo. I tried to answer a lot.

Dr. Andy Galpin
I probably answered five or six of the most common questions just now kind of all together that I got, and hopefully I answered your question directly. If not, please do let me know in the comments, and I'll do my best to answer all of them, if you can lay them out concisely, at least. The last question I wanted to get to is artificial intelligence related. I've been getting this more and more often and asked to speak on it quite a bit, and I got a lot of questions about it. So how am I thinking about and how do I recommend you think about the use of AI and various tools for your own health and performance? And I'm going to keep my answer restricted to that category for now, just in the sake of tightness. AI is obviously incredible. It's growing, and it's only going to get better. But as of the day of this recording, here's how I personally stand on it. It is tremendous as a tool. If it can help you organize, if it can help you find themes, if it can help you

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sift through big data sets of your own information, that's good and productive.

Dr. Andy Galpin
Where it struggles is helping you evaluate that. So if you were to take your blood work or your sleep tracking data or your training program and you just pump it into AI and you ask it to do things like, "Give me a summary of my training volume the last month," then it's great. "Plot out this. Write me a new program, and I want to switch out every shoulder press exercise for a machine alternative." It's awesome for things like that. It's really helpful, especially if you're coaching and you've got 15 or 20 programs, and you all of a sudden decide, we don't want to do trap bar deadlifts anymore, and you can just tell it, "Hey, switch out every time you see trap bar deadlift for a dumbbell RDL." Great. That would've taken me hours and hours to do in the past, and now you can do that in a snap of a finger. All those things are awesome uses for AI. The second part, though, the struggling piece, is when you upload your data and tell it to make judgment.

Dr. Andy Galpin
Is this good? Is this bad? Is this terrible? There's a lot of reasons for that. I'll keep it brief, but the reality of it is the way that most AI work or engines or LLMs are operating is one of two ways. First, they're either searching for the loudest voice in the room, and that's not expertise. And as we know about our field in particular, that's not always being amplified by those that have the most experience and are speaking the most honestly. So I'd caution you against that. I would not have it interpret or-- That's all I'll just keep saying it is don't let it evaluate good, bad, or terrible. It just doesn't have the data to do that. The second general way it does it is through what's called synthetic data, which means it's not actually giving you information based on any real data. Pros and cons to that, but in our field right now, it is currently a con because you're not being judged and evaluated against someone who you probably want to be evaluated against.

Dr. Andy Galpin
You're being judged against general population, which is typically made up of people who are not healthy or as healthy as you are or as healthy as you're striving to be. Now, whenever I say something like that, everyone goes, "Ah, no." But then I tell it, "Give me the optimal range, not the sick range." Spoiler alert, they don't do that. All they do is restrict the values. So if you say something like, "What's a good VO2 max for my age?" And it's going to tell you, "Oh, okay, you're 35 years old. A good VO2 max is between 40 and 45." And you go, "No, no, no. Give me what's great." It's going to go, "Great. It's between 45 and 50 then." How insightful was that, really? Well, sometimes maybe that's great, so that might be enough. But if it's something a little more complicated, it doesn't have a database of high-performing people that it can really pull from. So it really struggles there, and I know the comments will flood me with examples, and I promise you're all going to be wrong.

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Dr. Andy Galpin
This is my job. Trust me here. That's some of the stuff that it struggles with at this time. Where it also struggles with a lot is context-dependent solutions, and that's where expertise really starts to matter some. If you want to just plug into AI and say, "Give me a basic exercise program, give me basic nutrition program For many people, most people, it's probably good. If you take your average person who's not listening to this podcast, who you're probably not hanging out with, if I took some of my family members and I just said, "Yeah, put it into something and just give me the basics of nutrition, the basics of working out, give me a training program that's three days a week, and I get a little bit of..." It can do that just fine. But where it struggles is the, "Okay, give me that, but then this. Fold in this, fold in that, fold in this piece." Because it's just going to go off the loudest voice in the room, it's just going to keep things very generic and basic, and it lacks expertise.

Dr. Andy Galpin
So this is not a criticism. This is a way of saying, if you don't need the expertise, then they are totally fine to use. If you do, though, I would caution yourself against using them because they lack that true evaluation. One thing that's actually become really apparent the last couple of years is the demand for physical expertise is rising in the health and human performance field. It got crushed in COVID. Everybody went away from hiring coaches and trainers and things like that because they're doing everything at home, and then AI agents started to come on board, and now it's swinging back the opposite. People are hiring coaches more and more and more because they want to know someone who's actually done it, and because they want that personal interaction. I could go on, but for the most part, that's the tip of the iceberg with how we're thinking about it. Use it as lots of tools to organize, to put things together, to get paperwork, if you will, done, but really careful with it in terms of evaluating and then providing solutions.

Dr. Andy Galpin
So we've covered a lot of ground today, tackled four really important questions. We went over how I think about longevity and health and how to train for them and some of the biggest things to pay attention to, making sure you're well-rounded, making sure you are looking at important markers like muscle mass and balance and power and grip strength and VO2 max, but then not getting too sucked into them and over-interpreting what those things can mean and failing to realize what they don't mean. We then talked about the basics of training for muscle mass or hypertrophy versus fat loss versus strength, and we covered rules like the 72-hour rule for hypertrophy, the 5-4-3-2-1 rule for fat loss, and the 3 to 5 rule for strength and power. We then went on and talked about how I build training programs for people and all the modifiable variables like selecting exercises, the frequency, the intensity, the volume, the rest intervals, how we predict problems, and so forth, and how you can use those skills to put together your own

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training programs, or I guess if you want, build your own AI agent to build your training programs for you based on these standards.

Dr. Andy Galpin
And then we went into a discussion about functional strength and functional muscle and moving well and not necessarily worry about optimizing for some score on an exercise or some physical appearance, but trying to move better and be more athletic and fluid in how we approach training that way. And then, of course, we just finished on just a little bit of how artificial intelligence is effective and where it's currently ineffective in our field. I hope you enjoyed this, a little bit of a different format. If you did, let us know. We'll consider doing more of them. This was super fun for me. Hope you enjoyed it, and we'll see you next time. Thank you for joining for today's episode. My goal, as always, is to share exciting scientific insights that help you perform at your best. If the show resonates with you and you want to help ensure this information remains free and accessible to anyone in the world, there are a few ways that you can support.

Dr. Andy Galpin
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Dr. Andy Galpin
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