

How to Get Faster (Acceleration, Deceleration, Agility & Strength) | Les Spellman

Perform with Dr. Andy Galpin · Episode 36 · October 28, 2026 · Transcript

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Dr. Andy Galpin

Can you actually make people faster?

Les Spellman

People always ask me this, and to me it's like, wow, people still think that. But it's very similar to saying, can I actually make you stronger? Speed is very similar. I think we were talking about this off-camera, but the first thing that people don't do is people don't run fast. If you ask your average person, what's the last time you ran full speed? And it's like, dude, you haven't intentionally run full speed. So the first layer is if you run fast and you do it often enough, you get faster. That's the first layer. Then if you stack on top of it, okay, and we'll get into this, but what are the things that also are drivers to speed? Can you produce force? Can you produce force fast? Are you symmetrical? Do you have coordination? Over time, if you do those things, you'll be fast.

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 a scientist of human performance, and today I'm speaking with Les Spellman. Les is an expert in all things speed. He is a coach, practitioner, and true technician. One thing you'll learn from this episode is not only how to get faster, but what that even means. So whether you're interested yourself in sports, you maybe compete, train, or coach athletes, or you just really want to hear somebody who's at the highest level in their field, this is a conversation you're going to truly enjoy. Les has coached the world's best athletes in football, baseball, basketball, and everything else, and even in the last couple of years has personally trained over 100 professional athletes. And so really what you're going to see is somebody who understands and appreciates the science, but is extremely talented at getting those things to work in the world's best and most talented athletes.

Dr. Andy Galpin

So with that said, I hope you enjoy today's conversation with Les Spellman. The speed guru himself. Les, you're finally on the table, man.

Les Spellman

Thanks for having me.

Dr. Andy Galpin

We've been trying to work this out literally for years.

Les Spellman

Yep.

Dr. Andy Galpin

I don't remember what the date was, but I asked you several years ago, I'm like, "We got to get together. We got to get you in my class."

Les Spellman

Yeah.

Dr. Andy Galpin

And now we got a better place to do it.

Les Spellman

Yep.

Dr. Andy Galpin

We're going to talk as much as I can muster about speed today. It's been a passion of mine. It's one of the topics that I love talking about more than anything, because I feel like it's underrepresented.

Les Spellman

Yeah.

Dr. Andy Galpin

People don't really understand what speed is, why it matters, and I think if you were to look at all the physical training attributes, in my opinion, it is both the most important for athletics as well as the least discussed, most misunderstood. So it's this wonderful combination where I think after a couple of hours, people are going to walk away from this with their minds blown. Because I've seen you speak, I've seen so much of your content. It's going to be incredible.

Les Spellman

Oh, thank you, man. I'm excited to be here.

Dr. Andy Galpin

So I want to start with the most obvious question that is also perhaps the most controversial. Can you actually make people faster?

Les Spellman

People always ask me this and to me it's like, wow, people still think that. But it's very similar to saying, like, "Can I actually make you stronger?"

Les Spellman

Have you reached your capacity for strength? And everyone would say there's, obviously if I go in the weight room and I do things specifically, you're going to get stronger, progressively overload, whatever. Well, speed is very similar. I think we were talking about this off-camera, but the first thing that people don't do is people don't run fast. If you ask your average person, "What's the last time you ran full speed?" And it's like, dude, you haven't intentionally run full speed. So the first layer is if you run fast and you do it often enough, you get faster. That's the first layer. Then if you stack on top of it, okay, and we'll get into this, but what are the things that also are drivers to speed? Can you produce force? Can you produce force fast? Are you symmetrical? Do you have coordination? Over time, if you do those things, you'll be fast. I think a lot of people are like, okay, speed is genetic.

Les Spellman

There's guys on the team that are fast, there's guys on the team that are slow. And yeah, there's probably some truth to the four two guy was probably pretty fast, all the way throughout his life. But then you have the tight end guy that could've been a lineman but could've been a skill guy, and he's somewhere in between and he's not that genetically freaky, but can you make that guy faster? And over the past seven, eight years, I've always thought you could make people faster, but now I'm starting to see some of those average guys reach levels that are elite. NFL does the next-gen stats and does miles per hour, and you see guys that are running 21, 22 miles per hour in game, and you're mind-blown. But what if I told you I had some average high school kids running 21, 22 miles per hour in a game now? So I think it's just, number one, it's exposure, and then it's are you actually doing the task?

Les Spellman

So to go back to the question, I think a lot of people avoid training speed because, one, they think you need to be an expert. Like, oh, I need to be a biomechanist. I need to be Dan Pfaff or Stu McMillan, the best speed coaches in the world, or I need to be genetically gifted. And if you're not one of those two things, you're like, "Yeah, it's probably just not for me." So I think people avoid it because of that.

Dr. Andy Galpin

Well, I want to know how we do that.

Les Spellman

Yeah.

Dr. Andy Galpin

Right? How do we actually get there without having a PhD in biomechanics or having 20 years of experience? We tend to think about this in the way that we would think about pitching. And 20 years ago, it was like, you can't make a guy throw a baseball harder.

Les Spellman

Yeah. For sure.

Dr. Andy Galpin

And now the average fastball in Major League Baseball is up three or four miles per hour-

Les Spellman

Yeah

Dr. Andy Galpin

... in the last decade.

Les Spellman

Yeah.

Dr. Andy Galpin

We see speed records continually being broken. So a handful of questions on this. I want to frame a couple things, though, for people who maybe aren't familiar with the 40-yard dash and stuff.

Les Spellman

Yeah.

Dr. Andy Galpin

So 40-yard dash, what's an average time, maybe for an NFL player-

Les Spellman

Yeah

Dr. Andy Galpin

... and then what are the best times? And then that way when we bring those numbers up a lot, people are going to be able to stay along.

Les Spellman

Yeah. Okay, so positionally, you have skill guys that are going to be your outside faster guys. Those guys are going to have to run around 4.4 to 4.5 in that range.

Dr. Andy Galpin

4.4 seconds.

Les Spellman

4.4 seconds.

Dr. Andy Galpin

Cover 40 yards, yep.

Les Spellman

If you run faster than that, you're elite. If you run slower than that, you're sub-elite. But I think we found the average NFL receiver that's had 5,000 plus yards, and this accounts for 74% of the guys who have ever hit 5,000 yards, but the average guy hits between 4.4 and 4.59. That's the average. Big skill is technically linebackers, tight ends, those types of guys. But now these guys are starting to look like skill guys, so there's a broader range here. But generally, those guys are 4.5, 4.6, sometimes 4.7. You could be a bigger, I don't know, let's just say tight end, for example. A tight end average time used to be 4.7. Well, it's not anymore. It's like 4.5 something. But if you run a 4.7 as a tight end, you're generally fast. And then you have the big guys on the line, so O line, D line, and obviously there's a little bit of difference between their makeups, but generally if you go sub-five seconds for guys that are 300 plus pounds, it's very fast.

Les Spellman

If you're anywhere between 4.9 and 5.2, that's very good. Above that, not so good. And then your defensive guys, generally 4.8 to 5 seconds. So, and these are very general terms.

Dr. Andy Galpin

Of course, yeah.

Les Spellman

If you were to, say, compare the first round makeup to seventh round, there's probably 0.2 second difference in the average of those. But overall, those are the general spaces for them.

Dr. Andy Galpin

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Dr. Andy Galpin

I personally simply mix a scoop of their cinnamon flavor in some water every night, and by doing so, I make sure I'm covering any gaps I might have in my daily fiber intake that I try to get through eating a balanced whole food diet. If you'd like to try Fiber+ or any of Momentous's 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. So if we do believe your very, let's say, debatable position that you can actually make people faster-

Les Spellman

Mm-hmm

Dr. Andy Galpin

... we'll call that debatable for now.

Les Spellman

Yeah.

Dr. Andy Galpin

I want to get into how we actually do that. Some of the methods that you have really pioneered, I think is a fair way, or really exposed the world to. But in proposition for that, preparation for that rather, what is speed? Outside of meters per second-

Les Spellman

Yeah

Dr. Andy Galpin

... what's a broader, more basic understanding of what it means when you say somebody's fast or somebody's not fast?

Les Spellman

Yeah. This could be a three-hour segment alone because-

Dr. Andy Galpin

Oh, good. It's a good question

Les Spellman

Yeah. No, it's a great question, but okay, we're talking about speed as a capacity when we say, okay, you run 23 miles per hour. Speed is a capacity. It could also be a skill because there's conceptual speed. If I'm in a game and I take an angle and I get there fast-

Dr. Andy Galpin

Mm

Les Spellman

... that's technically speed, right? There's also multidirectional speed, so I could break down and create separation in space. Speed in a game looks like creating space, attacking a gap, closing space. It's very different. For the sakes of what we started with, it's a capacity. It's how fast can you run? When we see speed in sports, it's not always the fastest guy on the field that shows the speed and expresses it. So the expression of speed is completely different. It's a whole another rabbit hole that I'm sure we'll get into.

Dr. Andy Galpin

I want to get into that right now.

Les Spellman

Let's do it. Yeah.

Dr. Andy Galpin

I'm a Seattle guy.

Les Spellman

Yeah.

Dr. Andy Galpin

So Steve Largent is an icon where I come from-

Les Spellman

Yeah

Dr. Andy Galpin

... who's historically what most people describe as one of the slowest receivers-

Les Spellman

Yeah

Dr. Andy Galpin

... in NFL history despite being very successful. And if you ask the people, how did he win as a guy who probably ran a 4.8 forty?

Les Spellman

Yeah.

Dr. Andy Galpin

Where his defensive backs he's going against are running half a second faster-

Les Spellman

Yeah

Dr. Andy Galpin

... right? There's no way this guy can get open. So the question directly is, how much in your experience with, I don't know, 100 NFL athletes that you've coached at this point, how much does something like a 40-yard dash translate into being fast on the field?

Les Spellman

74% of the guys that have reached 5,000 yards for receiver position are in the middle of speed. The fast guys, so if you look at guys under 4.3 seconds, which is incredibly fast, how many of those guys have ever reached 5,000 plus yards in the NFL? One. One guy.

Dr. Andy Galpin

Ooh.

Les Spellman

Okay? Then you look at 4.3 to 4.4.

Dr. Andy Galpin

Who was that one guy? Do you know?

Les Spellman

Yeah, Tyreek.

Dr. Andy Galpin

Oh, Tyreek.

Les Spellman

Yeah, Tyreek.

Dr. Andy Galpin

Okay, yeah.

Les Spellman

But he technically didn't run at the combine.

Dr. Andy Galpin

Oh, pro day.

Les Spellman

So it was pro day. Technically wouldn't count.

Dr. Andy Galpin

Because I know John Ross, my guy.

Les Spellman

Yeah.

Dr. Andy Galpin

Grr.

Les Spellman

Yeah.

Dr. Andy Galpin

Poor guy.

Les Spellman

Incredible talent.

Dr. Andy Galpin

Yeah.

Les Spellman

So then you go between 4.3 and 4.4, and there's seven guys. Not a lot. So the primary group that ran average times that have the best success in the NFL were somewhere in the middle. So something that I always looked at, because when I got in the industry, I'm attacking speed from the standpoint of I got to be the best combine coach. I got to get you to run a 4.2, 4.3. And you go through that a couple times and you realize, okay, well, right after the combine you have rookie OTAs, which is essentially 70% of training camp volume. You're running plays. It's two days, sometimes three days in a row. It's a grind. Then you go into team stuff and it's like Everything you just taught and did doesn't necessarily directly translate, so you have to find ways to implement stuff earlier to get them right. So I'm going through this process and I'm like, "Okay, well, how important is peak speed?" Now, for draft position, running a fast 40 is incredibly important.

Les Spellman

If I have a guy that's projected round three and I get him round one, I might've made him \$18 million, which is helpful.

Dr. Andy Galpin

And you got a guaranteed contract versus a non-guaranteed contract.

Les Spellman

Thousand percent. To get more specific, let's take the receiver position, and then I'll expand this out. But at the receiver position, you're required to basically create space. And creating space, there's a couple ways you can do it. You could be Deshaun Jackson and just run straight and take the top off. Like, "We're just going to run as fast as you can. The ball will be there in the end zone. Just open up your hands like this. It's going to fall in your hands, I promise you." You have those guys.

Dr. Andy Galpin

Yeah.

Les Spellman

Now, a lot of those guys, there's a few of them that can last 10 years and be like Deshaun Jackson and do incredible things. A few of them. Most of the guys probably aren't even as fast as some of the corners that they're going against, so creating space has to come from a different mechanism, which is going to be deceleration, changing direction and different vectors, and then also knowing the game contextually, like being able to make a decision.

Dr. Andy Galpin

Strategies and tactics and-

Les Spellman

Strategies and tactics. So like Cooper Kupp, perfect example. He's always open. You call him right now, he's like, "I'm open." The dude is always open. I could list off tons of guys. Danny Amendola, if you remember that name.

Dr. Andy Galpin

Yeah, of course.

Les Spellman

Always open. The Patriots love these guys. They're like-

Dr. Andy Galpin

Yeah

Les Spellman

... "Let's go find-

Dr. Andy Galpin

Julian and all the guys, yeah

Les Spellman

... an average athlete and get him open because the strategies that they're using. So if you think about a car, the car that I would use for the combine would be a Lamborghini. I'm like, I want the biggest engine possible and I want to go as fast as I possibly can. I would not use a Lamborghini in a football game. You ever seen James Bond when he's basically running from the bad guys and there's a bomb going off here and a bomb going off there, and he's got the girl in the car and he's flipping a switch, and he's sending off rockets to... That's the NFL.

Dr. Andy Galpin

Yeah.

Les Spellman

You're avoiding so many things, and you're trying to find spaces, but you're braking, turning, braking, turning. So the first thing I think about is, okay, combine is building a bigger engine. Football is building a really good brake system. Now, on Aston Martin's website, if you go on astonmartin.com. It may not be there anymore, but if you look up astonmartin.com, on the front page of their website, it says, "You're only as fast as your brakes." That's on the-

Dr. Andy Galpin

Hmm

Les Spellman

... Aston Martin website.

Dr. Andy Galpin

No kidding.

Les Spellman

What they're selling is a car, a system that can brake the speed that it produces. And if you think about the car that you would want in an NFL game, you're going to want to have brakes. You can have a big engine. You're going to want to have brakes. And then the third part of that is just being able to brake. Braking is a capacity. Can I run really fast and stop? There's some technical skill in that, but a lot of that is your ability to produce forces eccentrically fast, really good tendon health, those types of things. But there's another side to that. You have to have steering. You have to have a steering wheel. So if I can have a really big engine, I can have really good brakes, but then I can steer and turn, then that's going to allow me to have at least the subsets that I need to get open. And if you break steering down, the steering wheel is your trunk, so where your trunk is and how it manipulates space, and where you put it in space to change directions.

Les Spellman

Your feet are like the tires, so you need to have a level-

Dr. Andy Galpin

Hmm

Les Spellman

... of compliance and stiffness. A tire that's overfilled is probably going to be a risk. A tire that's underfilled is probably going to be a risk. So you need to be able to get into deep positions, but also get out of it and be reactive, right? So I think about my analogy as like combine, I'm building a Lamborghini. The NFL, I'm building a version of the Aston Martin. Maybe not the fastest car, but the one that can brake and turn and change directions. Now, the other part of this that blew my mind when I started researching it is that if you don't have the braking capacities and you

don't have the turning abilities, you're not going to play a long time. Because I had guys go 4-2, 4-3 all the time. I'm super hype. We're celebrating on draft night like, "Ah, first round." Well, five years later, they're not playing in the league anymore because the game demands a specific quality out of the players.

Les Spellman

And we talked about receivers, but it's very similar at corners and every other position. But now let's expand that out from a football field, which has 22 players on the field at once, and you look at the dimensions of the field. It's a long field. It's relatively narrow. And you expand that out to a sport like rugby. So rugby is a slightly bigger field, but in traditional rugby, you have 30 people on the field, so there's even less space. So yeah, you can be fast. You could be an elite sprinter. And I had a guy, Carlin Isles.

Dr. Andy Galpin

Yeah, I know Carlin.

Les Spellman

Yeah.

Dr. Andy Galpin

He came to my lab.

Les Spellman

Yeah, so he played sevens. So sevens has a smaller density.

Dr. Andy Galpin

He's fast.

Les Spellman

Man.

Dr. Andy Galpin

Really fast.

Les Spellman

Man, he not only did like-

Dr. Andy Galpin

Shout out Carlin. Boy, he can move.

Les Spellman

Yeah, shout out Carlin. Shout out Carlin. And going back a step, I played rugby and they thought I was fast, and then I played against Carlin, and he would just run around me like I wasn't there. I don't even know if he remembers playing me because he just ran around me. But regardless,

he ended up being one of the fastest players-

Dr. Andy Galpin

Oh

Les Spellman

... field sport athletes in the world-

Dr. Andy Galpin

Yeah

Les Spellman

... in sevens. Now, Carlin went and played fifteens. You can ask him about this. Well, in fifteens, there's no space, so the speed of the game is going to dictate what you can do, and then finding space is harder, right? Or if you go to a sport like basketball, 10 players on a court. You could run 10 steps and be at the end of a basketball court.

Dr. Andy Galpin

Dang. Yeah.

Les Spellman

So the game is going to dictate the physical capacities you need to have. So it doesn't matter if you're like If you're a top, top, top sprinter and you go play basketball, it won't work. Now, there are guys like, Russell Westbrook, for example, wasn't a big breaking, dominant athlete. He kind of just went forward. And he had the skill set to do it. I was talking about this with PJ. He'd take a couple steps, get to the rim, get vertical. He had a really good ability to translate horizontal to vertical.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

Insane. Get to the rim.

Dr. Andy Galpin

I've never seen somebody who can run full speed and jump-

Les Spellman

It's insane

Dr. Andy Galpin

... like him.

Les Spellman

Yeah.

Dr. Andy Galpin

When you say translate horizontal to vertical, that's what you're talking about.

Les Spellman

Insane.

Dr. Andy Galpin

Most of the time, if you're running full speed, you have to slow down to go up.

Les Spellman

Yep.

Dr. Andy Galpin

And he just didn't.

Les Spellman

He didn't. He just kept going.

Dr. Andy Galpin

Wow. That's why when you watch him and when you watch Ja-

Les Spellman

Yeah

Dr. Andy Galpin

... you shouldn't be able to do that.

Les Spellman

No, it's physically like you're gifted. Look at LeBron. LeBron's interesting because LeBron, he doesn't do a ton of breaking either, and he only jumps off one foot. He only jumps off his left foot.

Dr. Andy Galpin

Really?

Les Spellman

Yeah. PJ pointed that out to me. I was like, "Huh?" So I went back and watched him. He does take off with his left foot, which is the whole asymmetry question, is like yeah, it's asymmetrical, and he probably developed a crazy asymmetry because of that.

Dr. Andy Galpin

Right.

Les Spellman

But yeah. Anyways, you have those types-

Dr. Andy Galpin

Well, that's Paul's problem to go fix.

Les Spellman

Yep. And then you have Luka, and you have James Harden. Now, Luka and James Harden, they had an NBA Combine, but if you were to publicize their stats at that NBA Combine-

Dr. Andy Galpin

Yeah

Les Spellman

... you'd be like-

Dr. Andy Galpin

Laughable

Les Spellman

... these guys are NBA players?

Dr. Andy Galpin

Yeah.

Les Spellman

Well, what does this sport demand? It's a small court with 10 people. There's not a lot of space. If you can create space from breaking, well, that's speed. So could you argue these guys are fast, not in the traditional capacity definition-

Dr. Andy Galpin

I see

Les Spellman

... but from the wider definition, these guys are fast.

Les Spellman

Luka creates more space than most NBA players because of his ability to break and jab step and get open and get an open shot. So that was a long answer, but yeah.

Dr. Andy Galpin

No, this was such an incredible analogy with the car that really helped me a ton conceptualize. You're going to give a ton of examples from the football perspective. It's what you mostly do.

Les Spellman

Yeah.

Dr. Andy Galpin

You've coached every kind of athlete.

Les Spellman

Yep.

Dr. Andy Galpin

Is it fair to say the concepts that you're about to outline here are concepts of speed-

Les Spellman

Right

Dr. Andy Galpin

... rather than sport-specific?

Les Spellman

100%.

Dr. Andy Galpin

So that said, if you don't mind, contrast me maybe just a couple of things about if speed in a basketball court is by definition very different than speed on a football field-

Les Spellman

Yeah

Dr. Andy Galpin

... as you just explained, for all the wonderful reasons.

Les Spellman

Yeah.

Dr. Andy Galpin

Does that change the training?

Les Spellman

1,000%.

Dr. Andy Galpin

How so?

Les Spellman

Let's say I'm a GM and I'm at the NBA Combine, and as a GM, I'm a first-year GM, I'm like, "I'm

going to draft the guy that has the best three-quarter..." That's what they do in the NBA. It's a three-quarter court sprint.

Dr. Andy Galpin

The sprint test.

Les Spellman

Yeah.

Dr. Andy Galpin

Their linear speed-

Les Spellman

Yeah

Dr. Andy Galpin

... is a three-quarter court.

Les Spellman

Yep. So if I was going to draft based on that, I would end up getting guys that were extremely fast, but they are probably not good on a basketball court. Now there are outliers. There's guys in the upper quadrant with skill and ability to break and have all the capacities and do all those things. But I'll be fired year one because I put together a team that can probably run the court, but when it comes to doing the things you're required to do in basketball, because of the density that's experienced in the game, there's not space. So finding those moments, like you ask your NBA strength coaches how many times the guys reach over 90% of their max speed in-game, very rarely, almost never. Even in transition moments, it takes seven to eight hard steps in one direction to get to about 85%. So you're guessing eight, nine, 10 steps straight in a line with a ball? Come on. It just doesn't happen that often.

Les Spellman

It's very similar to saying, like, "Okay, guys don't hang clean on a football field. Should we still hang clean?" Yeah, if you want to develop capacities through doing a hang clean, just do it. That's fine. So there are transfer things from doing the training of speed. Now, if your program isn't balanced, now there's an issue. So when I train basketball players, we train primarily acceleration and we microdose in high-speed running. So those are two things that I look at them as weight room exercises for court sport athletes, like the same way you'd look at doing a bench press or a hang clean or a med ball throw. It's an exercise. We're selecting that exercise because it's on the spectrum of very high speed, very short contact times. You're getting hip extension. There's a coordination effect, and there's a downstream nervous system effect to that work. So yeah, we're going to do that. Now, do I coach it, like put your foot here, put your trunk-

Dr. Andy Galpin

Hmm. I see.

Les Spellman

Nope. I do resisted and unresisted work. But then you think about what am I going to spend the bulk of my time on? I'm going to spend the bulk of my time on preparing for braking and deceleration, and basketball players play a lot of basketball.

Dr. Andy Galpin

Yeah.

Les Spellman

So you're going to have to think about, okay, I'm going to have to support what they're doing on the court and allow them to do more of that and maybe even accentuate some of that. So maybe there's priming pre-court or after the court, there's rehabilitative stuff, and not rehab from like a, I'm a DPT, like rehab. I might be doing some slow force, eccentric tendon remodeling type things, post-game, post-practice, those types of things that are going to support the next exposure. And then the third piece that I would do is what are all the vectors that I change directions in in a basketball game? You're going to have some uphill cuts, meaning I'm maintaining speed and cutting, like putting my foot down. Outside cut, inside cut. I'm changing directions, going uphill, but I'm maintaining speed. Then there's going to be some where I actually have to slam on the brakes and change directions another direction.

Les Spellman

So what do those moments look like? And then I'll start to train the specific things that are going to show up in that sport. Let me tell you how I did it wrong in the past.

Dr. Andy Galpin

Love it.

Les Spellman

And then I'll go forward. So when I first started I'm reading all this research on speed, and I'm hanging around, I'm watching Dan Pfaff, who's arguably best coach in history for track. I'm watching Stu McMillan, who was mentored by Dan Pfaff. I'm watching all these guys, and I'm like, "Man, I'm just going to take what they're doing, and I'm just going to throw it to all my athletes." And what I saw was that all my athletes got fast, like really, really fast. Not elite 100-meter level-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... but elite for their sport. Which is, for men, running 23 miles per hour is very fast.

Dr. Andy Galpin

That's the number, right?

Les Spellman

Yeah, that's elite.

Dr. Andy Galpin

That's the number everybody wants, is 23.

Les Spellman

It's elite. And I had a lot of them. I had white guys running it. I had Black guys running it. I had high school kids running it, and I'm like, "This is super cool." On the women's side, reaching 20 miles per hour, 23 is equitable to a 20 mile per hour run for women, or 19 is like 22. So, I had a bunch of women running 20 miles per hour. I'm like, "Okay, this is cool." Now, what I saw with this group, and I apologize guys if you're listening to this and I was training you at this point. But a lot of them weren't very-

Dr. Andy Galpin

Demand your refund now.

Les Spellman

Yeah, get your refund. Not for real, but okay, so it didn't necessarily serve them well long-term. Now, short-term-

Dr. Andy Galpin

Ah

Les Spellman

... 1,000%.

Dr. Andy Galpin

Interesting.

Les Spellman

Yeah. Same in football, same in baseball, same in basketball, all these things. So eventually, I'm realizing, okay, I might be the problem. Yes, I'm getting them faster, but it's not translating to the sport. Why? Because they have this new superpower, and it's like, cool, I want to use this superpower every day. I want to do it all the time. Well, it's not one of those qualities that you can continuously tap on an every day basis. Now, there's a few athletes I've seen do this, like Tyreek Hill is one of them. He could always go. I got a power returner on the Rams, Alex Bachman,

number 11.

Dr. Andy Galpin

Mm.

Les Spellman

He's on year maybe 10 now. He was undrafted, but he ran a 437. This dude I've never seen get tired. Alex, if you're listening, I don't know how you're doing it, but keep doing it. So, it's not a resource you can just tap into every day. So going back to the question, yeah, I had to figure out how to develop aspects of the linear speed parts, acceleration, and max velocity, but I also had to dose in other components that were required for the sport. One of the most challenging things about an NFL game is it's four hours, pretty much. You think about it.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

You go pre-game, then you go in the locker room, then you come back out, then you have four quarters, then you have halftime, TV timeouts, whatever random timeouts, advertisement, whatever. So you think about just the sheer standing volume is high, and then you add in all the low-level movements that happen throughout a game, and it's not uncommon to see similar volumes and distances to a Premier League player in a football game, and now Premier League can go a lot higher, so don't roast me for that. But if you think about it, the football game is four hours. So you're picking up-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... so much low-level stuff throughout the game. Now, Premier League, it happens in 90 minutes, plus it's set. Obviously, you have stoppage time and things, but-

Dr. Andy Galpin

Few minutes here and there

Les Spellman

... you're not going four hours.

Dr. Andy Galpin

No.

Les Spellman

Not going four hours. So yeah, the density is significantly different. But the capacity piece

became a major emphasis for us. So, you could call it conditioning, you could call it repeat speed, all those things. And there's layers to it, like low level to high level, but that was a major missing component. I think if you look at training right now, a lot of people have gotten away from that. A lot of people. Because it was underpinning our industry as a whole from the beginning, strength and conditioning. That was our field. The aerobic side was half the equation. Now what happened, yeah, people got away from that completely.

Dr. Andy Galpin

I feel like I have a pretty good understanding of speed training, and then I popped into the gym this morning, and I saw you on the treadmill for at least 90 minutes?

Les Spellman

It was an hour. It was an hour.

Dr. Andy Galpin

A minimum.

Les Spellman

Yeah.

Dr. Andy Galpin

And then I'm like, "Okay, what is going on?"

Les Spellman

Yeah.

Dr. Andy Galpin

This dude is walking and jogging for an hour.

Les Spellman

Yeah.

Dr. Andy Galpin

And I just thought, "He's getting slow." Every step this man is taking, he's getting slower.

Les Spellman

Yeah.

Dr. Andy Galpin

Am I wrong here? What's going on?

Les Spellman

Okay, yeah. Okay, well, personally, I use aerobic work as a way to recover from my high-intensity work. So, I can recover relatively fast from aerobic work. And as you saw, I was going very slow.

So just to give you context, if you're listening, I bike very slow for 20 minutes, I walk uphill on a treadmill for 20 minutes, and then I run for 20-ish minutes. And it's all-

Dr. Andy Galpin

And what were you jogging at relative to your own speed?

Les Spellman

Like 5.5 miles per hour.

Dr. Andy Galpin

Yeah.

Les Spellman

So very, very, very slow. For me, it's zone two. And I'm not an expert on the heart rate stuff, but zone two for me keeps me in the zone, fat burning, because I'm 37 years old, so that's another piece.

Dr. Andy Galpin

Mm.

Les Spellman

I'm not really an athlete anymore. But it also helps me recover from the high-intensity work that I did yesterday, which was hill sprints. So, I'm using it as a way to essentially flush my system out from the work that I did, and also mentally, it's one of the things that I feel like is a superpower. If I could sit there for 90 minutes and grind out work, and I was listening to your podcast.

Dr. Andy Galpin

Lies.

Les Spellman

Yeah, no, I was.

Dr. Andy Galpin

All lies.

Les Spellman

I was listening to the one on testosterone.

Dr. Andy Galpin

Yeah.

Les Spellman

It's a way for me to really learn, which it sounds weird, but I learn almost twice as fast when I'm in those settings, and I throw on your podcast or Huberman's pod- whoever. I'm learning way

faster. But yeah, that's it. That's me at 37. Now, do I have my athletes do it? Is probably the deeper question. No. I don't have them do that level. Now, post-game, game day plus one, all of my NFL guys will do a protocol, and it's walking on a treadmill 8% incline, 3.5 miles per hour. We use BFR through Hytro, which is insane. If you guys haven't heard of Hytro-

Dr. Andy Galpin

Yeah, compression shorts that have blood flow restriction built into them

Les Spellman

Easy. Yep. So, we cycle on five minutes on, three minutes off, go through a couple of cycles of that. If you are listening and you try that, thank me. I don't care what you do. I don't care if you just go out and drink on the weekend.

Dr. Andy Galpin

Publicly thank him, tag him.

Les Spellman

Tag me.

Dr. Andy Galpin

Send him the emails. Yeah.

Les Spellman

Please, because, man, it's one of the best ways to down-regulate from the high-intensity work of a game.

Dr. Andy Galpin

Can you repeat that? Because we're going to get a flood of being like, "Whoa, whoa, whoa."

Les Spellman

Yeah.

Dr. Andy Galpin

Exactly the protocol, and this is post-game? This is the day after?

Les Spellman

Day after the game. So, if you guys haven't heard of game day tags, game day is the highest point of the week, and then the next two days after the game are typically the recovery cycle. In the NFL, the way that the NFL PA works is that they have to have one mandated day off, and the research points to the day off shouldn't be the day after a game.

Dr. Andy Galpin

Correct.

Les Spellman

You should do something. And you could probably give me the whole biological reason. But the guys take off Tuesday, which means Mondays are game day plus one. So, something has to be done on that Monday. Some teams are a little bit more open, like choose what you want, do what you want. Some are team-based. Also depends if you win or lose.

Dr. Andy Galpin

Yeah.

Les Spellman

You win a game, you get somewhat of a choice, especially veterans. But for our guys, we have them walk on a treadmill, 8% incline, 3 to 3.5 miles per hour. 3.5 can be kind of fast if you're really fatigued. So, we scale it. If you're at 3.5 and you bump into zone three or zone four-

Dr. Andy Galpin

Yeah

Les Spellman

... bring it down.

Dr. Andy Galpin

Pull it down.

Les Spellman

It doesn't matter the speed. That's generally where we're at. And then we'll go three cycles of five minutes on BFR cuffs. So occluded level two, which is pretty intense. And then we'll go three minutes off, so just release the strap, walk for three minutes, and do that three times, sometimes four. That's option one. Option two would be something in the pool. So, just like high knees in the pool, move around in the pool, still use BFR and that. And option three would just be an elliptical or bike. So personally, I can't really get much out of an elliptical. Maybe that's just me. So, I'm biased against it. And then the bike, I feel like if you're not a regular biker, it's going to flare up your quads a little bit. And these guys feel the burn, especially BFR. So, I found walking was one of the easier things. Now, if I expand that out into my mom or my dad or a different subset of people that aren't elite athletes, walking has become one of the mainstays of all the programming that I give my parents, and low-level work to really reset them, and it's been incredible.

Les Spellman

Don't go out there and run, Mom. You're 60-something. Oh, wait, she's 70-something now, 72 years old. Don't go out there and try to run, just walk. So, you think about this work, think about capacity, think about all those things, and it's not always like we're not really building much, to be honest, when we do the BFR. We're just resetting for the next week and getting them essentially

ready for that work that they're going to do in the middle of the week, which is practice, and that work going to get them ready for the higher-level work at the end of the week. So, it's building blocks into the week. Yeah.

Dr. Andy Galpin

Are there any other recovery tools that you guys have found effective?

Les Spellman

Yeah. Well, I'll be honest, we used to do an extensive amount.

Les Spellman

You've got to find a hyperbaric chamber. You got to get an IV. And it wasn't until we started really tracking their-

Dr. Andy Galpin

It's amazing, right?

Les Spellman

Yeah. And you realize-

Dr. Andy Galpin

Data.

Les Spellman

... you start tracking the data and you're like, it's not really that different than just sleeping a lot, eating pretty good, and hydrating, and then doing some low-level work, getting some sunlight. And I'm sitting in the same room Huberman sits in and you sit in, so obviously, if you're listening to this podcast, you've probably heard all these things. But getting early sunlight, consistent bedtimes are the two biggest things.

Les Spellman

And I got this from the "Huberman" podcast. I'm sure you've talked about it, too, but the consistent bedtime thing. If you think about the NFL and how they have to travel, practice, play, do all these things, it's all over the place. And it's worse in the NBA, hockey, and all those sports. But post-game, we still have to try to find a way to do it. And we circle all the games where they're going to have a late start, and you're going to be traveling and all those things. But you're basically just finding if you can't do plan A, what's plan B, as close as you can. Eye mask on the plane, earbuds, no music, just put them in, and just block out the noise, go to sleep. Magnesium timing, all those things. I found those have been better recovery tools than all the high-end. We've done light beds, \$100,000 light beds. We've done all the things. It's the basic protocols that I've heard from Huberman and you, and all the guys.

Les Spellman

It's crazy. I'm an avid listener, but I didn't expect the guys to buy into it that deeply, where it's like, "Bro, in college, I was doing the light bed every week, and I feel better than I felt then."

Dr. Andy Galpin

Hmm.

Les Spellman

So, it's cool.

Dr. Andy Galpin

Nice.

Les Spellman

Yeah.

Dr. Andy Galpin

What is the difference between linear speed? First of all, what is linear speed?

Les Spellman

Yeah.

Dr. Andy Galpin

What's nonlinear speed, if that's a thing?

Les Spellman

Yeah.

Dr. Andy Galpin

And then how do you think about these words like agility?

Les Spellman

Yeah.

Dr. Andy Galpin

Change of direction. What does that stuff actually mean?

Les Spellman

Yeah. Okay, so I'll break them down. So, when you're talking about tennis, starting with the end, tennis is multidirectional speed. So, that's your ability to accelerate, it's your ability to decelerate, change directions in different vectors, and the agility side would be making a decision. So, the difference between multidirectional speed as a capacity, multidirectional speed as a decision, decision makes it agility. So, agility-

Dr. Andy Galpin

So-

Les Spellman

... is just made up of your ability to decelerate, change directions In a response to a task or within your environment, it's a decision. It's purely a decision that creates it. Now, agility's going to be more intense because you're reacting to something, which is a shorter timeframe to react. If you're just doing multidirectional speed with cones, you're pre-planning your change of direction, which is going to change intensity. So when you look at all these components, I think of it as pillars of a house. You have your ability to accelerate, that's one pillar. Your ability to hit high speeds, that's one pillar. Ability to decelerate, it's another. Ability to change directions in different vectors. And we talked uphill, so think uphill meaning I'm maintaining speed, I'm curvilinear, running something. Downhill meaning I'm slamming on the brakes and coming back in the other direction. So you stack all those pillars, those underpin multidirectional speed.

Les Spellman

Then you look at your sports. You have tennis, you have basketball, you have baseball, you have football, soccer, whatever. The first thing I do when I get an athlete is I look at the, what does a sport demand? And as simple as, I alluded to this in the beginning, but as simple as what are the dimensions of the court, right? And how many people are on the court at once? Because then you just do a quick math equation, and you find out density per player. Now, a sport like Rugby Sevens has, you have a lot of space. So you might be 500 meters squared per player that they could potentially cover. Then you get a sport like basketball, and it's like, okay, well, there's probably only 84, I think it's 84 or 85 meters squared. It's not a lot. So that's the first thing. Now, your analytical mind can then go to, okay, if it's a small amount of space, then it's probably going to be more on the pillars of deceleration, change of direction, and agility.

Les Spellman

Now, if it's a big amount of space, like Rugby Sevens where I started, you have massive amounts of space. That's why Carlin Isles became world-famous, because he was doing 70, 80-meter runs consistently throughout a game.

Dr. Andy Galpin

Yeah.

Les Spellman

It's not going to happen in other sports. So the first thing I do, pillars, density, okay, cool. Now I know the distribution of where I need to go. So a sport like tennis, how many steps do they take before they decelerate? If you just watch a game and you're just looking at Serena or any of those players play, and you're like, "They're not really taking more than three, four steps at a time before a break." So if you watch tennis, in a single step, they're slowing their speed by 40,

50%. They're braking hard on one step because the court can slide a little bit, so that ability-

Dr. Andy Galpin

Yeah

Les Spellman

... in football, you can't slide, so you're going to take multi-steps. When you brake, it's happening over three, four steps to come to a stop.

Dr. Andy Galpin

Totally different strategy.

Les Spellman

Yeah, different strategy.

Dr. Andy Galpin

Wow.

Les Spellman

Which means that you're probably going to have a little bit bigger touchdown distance, further in front. So if you look at tennis, watch Serena, find old photos or videos, she creates this really big stride length in her deceleration. And so there's-

Dr. Andy Galpin

Mm

Les Spellman

... a skill to that, and slides or does what she needs to do to redirect the force going back the other way. It's pretty incredible. So if you look at that as a skill, then you look at the capacities that are built around it, eccentric strength, the ability to tolerate massive eccentric forces, ability to repeat it consistently over time, so capacity. There's a lot there. You also have to be in a position to hit a ball and return it back on the other side. So your ability to orient your trunk is incredibly important. Also disassociate-

Dr. Andy Galpin

Yeah

Les Spellman

... because I have to be able to be in a position where I can brake and change my upper body angle to then swing. Incredibly difficult. So my distribution of time in my week is going to be on those things. So my job, if I'm working with a high-level tennis player, is really support. I know that those pillars, change of direction, deceleration, agility, some acceleration. Not a lot of max speed, but some. I'm going to support what they're going to do on the court, so I'm going to do

things before and after that are going to highlight what they have to do, and protect, but also develop. And that's a process for every single sport we take. Now, if it's track, you can start to remove some of the braking, change of direction, agility. Not a lot of decisions other than-

Dr. Andy Galpin

Right

Les Spellman

... reaction time and things like that, and we're going to do speed. So-

Dr. Andy Galpin

You basically have one decision, when to start-

Les Spellman

Yeah

Dr. Andy Galpin

... and that's it.

Les Spellman

Exactly.

Dr. Andy Galpin

If I'm understanding your definitions correctly, agility you said require- agility was different from-

Les Spellman

Change of direction

Dr. Andy Galpin

... change of direction-

Les Spellman

Yes

Dr. Andy Galpin

... because it required a choice.

Les Spellman

Yeah.

Dr. Andy Galpin

So in your tennis analogy, a ball's coming at me, and not only do I have to get to something three steps away, but now I have to decide is that three steps away, or three and a half steps away-

Les Spellman

Yeah

Dr. Andy Galpin

... or what kind of a shot am I going to do?

Les Spellman

Perception, action. Yep.

Dr. Andy Galpin

Right. Where change of direction is simply, I'm going to go from this cone to that cone, and then I'm going to turn and go to that cone-

Les Spellman

Yep

Dr. Andy Galpin

... over there. How do you stand on things like an agility ladder?

Les Spellman

I don't mind agility ladders or cones. So just if you're using them, don't throw them in the trash immediately. It just depends on what you're using them for. Now, agility ladders became popular right around the time Instagram became popular. So there's a correlation here. There's a direct correlation.

Dr. Andy Galpin

Yeah.

Les Spellman

So if you look at Instagram in 2012, and you look at agility, you see NFL players using it, and as a kid, you're like, "That's what I got to do. That's how you build agility." So there's some of that. And also, our field as strength and conditioning coaches expanded from just team guys to now I can develop a business using social media. So what I'm going to do as a business, and I'm on social media, is show my work. And a lot of people were showing agility ladders and cone drills and those things. So-

Dr. Andy Galpin

The confusing part is it's not actually agility, because you're not choosing anything.

Les Spellman

There's no decision in it. What they're basically saying with agility ladders is that doing the agility ladder is going to help develop the skill to move your feet fast. Now, yes, it does do that in some ways, I guess, if you really want to make the argument. But that's not what makes you a good

decelerator. And there wasn't a lot of deceleration research until recently. People are being taught to change directions and to be a good football player, soccer player, and all that, you have to move your feet fast, which is not even close to what's happening when you decelerate and change directions. So I'm going to come back to that in a second. So as Damian Harper started doing his research, he found that the early part of the deceleration before the change of direction, so like when you initially put your foot in the ground to decelerate, those first three steps are incredibly important. And there's forces like four times your body weight in that, like huge forces, vertically and horizontally.

Les Spellman

And that capacity is something that a lot of athletes haven't trained. Now, what happens is, if you watch athletes change directions, what you see is the final foot contact and the change of direction. Your eye is not really picking up because we're not trained to pick it up, that initial breaking step that slows the momentum by 25% and the second one that slows it by another 15%. So in three steps, you're slowing by 50% of your speed. That's not sexy. You're not seeing it. You're seeing the final two steps that have changed directions. So what the industry initially was thinking was, we need to train that final foot contact. So it is quick. Mm. It is off the ground quick. Yeah. Okay. All right. It does look like it's rapid, does look like it's pop! But that's not what's actually happening. So Damian Harper puts this research out on the, at the time, I'm like purely on acceleration and profiling and speed and what's the best technique and all, which we can get into later, but like I was purely down this rabbit hole, and I read the research and I'm like, "Dude, I've been doing this all wrong."

Les Spellman

Now, I'm not using Jody ladders at the time, but I am doing things like teaching the final foot contact and how to burst out of the cut and all that. But a cut, a change of direction, is actually two things. It's a deceleration, meaning slowing your speed, and then a vector change. Like you're changing vectors. The changing vectors part isn't that hard, but the skill actually happens in the first three steps of deceleration. So with that context of how effective it is, a speed ladder, it's not very effective at all because it doesn't do anything to teach deceleration. Nothing. It just makes you move your feet fast. Expand that out into cones. You've probably seen tons of cone drills where people run around cones and do those. Now, I use cones to this day because I think of deceleration and change of direction and agility as a continuum. So if I'm training you, I'm training your deceleration parts first.

Les Spellman

I'm going to help you learn how to brake. I'm also going to build the capacities in the gym. We're going to do eccentric slow force and fast force. We're going to do tempo stuff to accentuated stuff to fast reflexive eccentrics. I'm going to use that whole continuum. I'm going to build that

ability, but then I'm going to teach you how to vector change. And to teach vector change, at first, you have to dumb it down to the smallest components. If I want to change directions 90 degrees, I got to give you a target to, "All right, go around the cone, go right." Okay? If we want to go 135 degrees of coming back, like in an angle, then yeah, we're going to put a cone there at first. Mm. Once you've developed- I see ... the skill, and the skill is going to come from different entry speeds, so meaning like I could walk you into it and change directions, or I could jog into it, or I could sprint into it.

Les Spellman

Once I've given you the ability and the capacity to decelerate into different directions, then I introduce agility, which is going to be decision-making. Now, to go back to the original point, if you're not good at breaking, you're not going to be good at changing directions. If you're not good at changing directions, agility is not only going to be poor, but it's also risky. Give you context. If I'm doing 180-degree tasks, that means I'm running to you, changing directions, coming back, and I don't decelerate well, well, all the stress is going to go to my final foot contact. So my final foot contact is when I put my foot down to then come back.

Les Spellman

My final foot contact is not only going to be a directional change, it's also going to be a massive deceleration. And if you were to look at like deceleration data, it might look like, "Oh, that was a really good decel because it was high." Well, it's only high because your speed coming into that cut was too high. Directional change and deceleration on the same contact is how a lot of people will tear their ACL. And I'm not the ACL expert, so like if you're that, but at the same time, the directional trunk changes, any change while you're decelerating, it becomes a bigger risk, a much bigger risk. So this is like the epiphanies I'm having in real-time as a coach. I'm reading his research. I'm like, "Okay, deceleration's important. How do I do it? Okay, cool. It's also a risk." Man, a lot of the work I've been doing hasn't been developing the types of athletes I should be developing. So if I want to get an athlete from not only the capacity to accelerate, decelerate, change directions, all those, I have to now introduce game speed, because what makes a player good in-game is their ability to select these capacities at the right times.

Les Spellman

So we talked about punt return. If I'm a punt returner and I just run straight, what's going to happen? Like I'm going to get hit by a 275-pound guy that is trying to make the team, and he's going to hit me so hard, I'm not going to remember what day it is. You have to change directions, but you have to find the gap, and you have to find the hole, and you have to react to a defender trying to take your face off. Those are all skills, but they're capacities first. So at some point in my training, I have to introduce the capacity, but also the skill, which is the decision, which is going to increase the intensity of my work. So Long answer, but if I were to go from beginning of

the season, or off-season to the end of the off-season, I'm going to start very general, build the capacities. And as I go, I think about higher volume, GPP, lower intensity to entry, just basic strength training. But as I go, I want to add more intensity.

Les Spellman

Well, how do I add more intensity? I change the speed into the cut, I change how much high-speed running we're doing, and then I start to change the decisions. And once I get to the decisions part, the intensity gap between my off-season training and the actual training camp is a lot smaller. Now, this isn't a statement of wrong here, but if you look at the gap between what most players do in the NFL, in the NBA, and in their off-seasons, you look at their gap between their off-season and training camp in the season, there's probably a large gap there.

Dr. Andy Galpin

Is that large gap increasing risk of injury?

Les Spellman

Yeah, absolutely. Now, again, this could be the crippable thing. People could be like, "Man, they were talking about this. It's going to lead to an injury." Not necessarily, but yes, 100,000%.

Dr. Andy Galpin

That's the concern-

Les Spellman

It is

Dr. Andy Galpin

... its potential, right?

Les Spellman

It's leading in that direction. And if I were to just, okay, let me just take my population. So I'm not talking anyone else's population. My training led to injury because I wasn't bridging the gap well enough between the off-season and the in-season period. So yes, and I think a lot of people are guilty of that, too.

Dr. Andy Galpin

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. If you wouldn't mind, tell me more about this deceleration, and you've mentioned something else, vectors.

Les Spellman

Yes.

Dr. Andy Galpin

The vectors change.

Les Spellman

Yeah.

Dr. Andy Galpin

Help me understand those a little bit better, what that actually means technically, and how I should think about incorporating it.

Les Spellman

Yeah. Okay, so I've mentioned Damien Harper a couple of times. If you haven't heard of him, his work is incredible. He's primarily a researcher on deceleration. The initial paper that I read from Damien Harper said that deceleration is one of the most damaging, high-force actions you can do.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

It's damaging. Start with that, and then there's also high force in that. So you look at damaging, high force. Okay. And then you look at the body has to do something from a tendon perspective that's very different than other actions your body does. It's very different than doing a bicep curl and all that. You have a muscle contraction that then leads to a tendon response, and the muscle action is primarily eccentric, and it's very high force. And if you look at all the research that's done right now, you could produce significantly higher forces eccentrically than

concentrically.

Dr. Andy Galpin

Of course, yeah.

Les Spellman

So you look at this action, it's like, okay, well, just from a training perspective, it now became important to me. So what deceleration is, is slowing your body down, but how fast you can do that is incredibly important, especially for changing directions. So before I get to the vectors, the deceleration part, you can almost break it into two parts. So let's say we're just running 20 yards, and at 20 yards, we're going to slam on the brakes, and you have to stop before the 25-yard line, okay? Now, that stopping point from 20 to 25, there's very different phases of that stopping that are going to be primarily dictated by your capacities. So the first half of that is going to be early deceleration. So when I'm at my peak speed at 20, I put my foot down and brake. Over the next one to three steps, I'm slowing my speed by 50%. That part, which I mentioned before, is the part that a lot of athletes aren't specifically training, both from a capacity standpoint and a skill standpoint.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

It wasn't part of my high school warm-up to run fast and then slam on the brakes. It wasn't something we do. Now, but it is something you do in sports, and it is something that your sport will probably require you to do. So that early part, now thinking about running high speeds, fast contact times, that early part is going to be shorter contact times and a longer step length because you're running full speed. Your step length is already pretty long. As you slam on the brakes, you can't just put your foot in the ground and it stops, so your contact times are going to be relatively short. So high force and short time frames, okay? So you think about that. It's not really what you think about when you think about deceleration. You think long ground contacts and all these things.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

Well, no, it's short contacts. It's hard. Okay, the second half, and this is over one to three steps, you should be able to brake yourself to 50% of your peak speed. Once you get to the later half, that's going to be late deceleration. Late deceleration is- Also very different. So longer ground contact times and shorter step lengths, and they get shorter as you go until you reach a final point and a longer ground contact. Now, the directional change, this is the key point, and we've

talked about vectors, the directional change is happening in that later half. It should, at least. That's when my trunk starts to change directions, that's when my feet might change directions. That's when the vector change happens. So the first part of deceleration is something I feel like is under-trained in a lot of athletes. The ability to stop from a high speed, put your foot in the ground, put high forces.

Les Spellman

Now, what are the things you have to do to build that? We can get into that, but there is some skill involved in it because you're basically extending your foot and creating a forward touchdown distance. Whereas speed, you're like, huh. In acceleration, I want to have a backwards, right under my hip. And then as I get to high speed, it's going to start to be slightly in front of my body, but not really too far because that'll create a break. Well, it's the opposite in deceleration. You're putting your foot out. You need to have rapid triple flexion, meaning as soon as I put my foot down, everything just compresses.

Dr. Andy Galpin

Mm.

Les Spellman

Your hips drop, your trunk doesn't lean forward, just drops straight down. There's a skill, but there's also that capacity. Then the second part, the vector change. So just think of a clock. So you have different points on that clock. If you were to imagine a clock and visualize this, 10:00 to 2:00, let's say that's the green zone. You're going to run fast. If you cut and change directions uphill like that, the goal is to not slow down. So the way you produce force in the ground, it'd be primary propulsive. You're going to stick your foot in the ground, you're going to redirect another direction.

Dr. Andy Galpin

You've said this a couple times. When you say uphill-

Les Spellman

Uphill, yeah

Dr. Andy Galpin

... you're not actually physically meaning up a hill.

Les Spellman

No.

Dr. Andy Galpin

You're meaning-

Les Spellman

Like-

Dr. Andy Galpin

... if I'm running straight and I were to brake and keep going forward, but at a 45-degree angle or something.

Les Spellman

Yeah.

Dr. Andy Galpin

Is that what you mean?

Les Spellman

Yeah, a 45-degree angle. So anyway, you're cutting uphill 45 degrees. So that's primarily green. Okay, so then you expand out. So you look at 60 to 45 degrees. The directional change is a little bit more acute. Okay, well, you kind of have to put your brakes on or slow down, but you don't have to slam on the brakes yet. Okay? But then you go into, and this is all Tom Dos Santos' work.

Dr. Andy Galpin

Sure.

Les Spellman

Yeah. I didn't build this, so-

Dr. Andy Galpin

Yeah

Les Spellman

... just so y'all know. And then you look at 90 degrees. Well, 90 degrees, think about a out route, think about a square cut in football. You do have to start to put the brakes on.

Dr. Andy Galpin

Yeah. No one could do that.

Les Spellman

I've seen a few guys, especially recently, Amon-Ra St. Brown is one of them.

Dr. Andy Galpin

Mm.

Les Spellman

Tyreek Hill is one of them. I see them change directions without slowing down in some ways.

That don't make any sense.

Dr. Andy Galpin

So you're running straight-

Les Spellman

Don't make no sense

Dr. Andy Galpin

... and then immediately you go left turn, right turn at a 90-degree angle-

Les Spellman

Left, turn right. Yeah

Dr. Andy Galpin

... with very little change in speed.

Les Spellman

Yeah, so-

Dr. Andy Galpin

Wow

Les Spellman

... there is a braking component to that. Even if it's just a single step, that single step does slow your speed down, so technically it's a deceleration. Now, would that deceleration show up on GPS, like negative 3 meters per second squared? Maybe not. But it's definitely a slowdown. But then you go under 90. So you look at 135 degrees.

Dr. Andy Galpin

So you're coming backwards-

Les Spellman

You have to-

Dr. Andy Galpin

... coming that closer to where you started.

Les Spellman

You have to slam on the brakes. So there has to be the deceleration component before the change of direction. So you have to have the ability to slam on the brakes and have a very short contact time and produce high forces eccentrically. That then allows you to slow enough to then change your body direction, and by the time you reach your final foot contact, there's not too much speed coming into it that's a risk. So you have to slow your momentum. And if you think

about it, if I spell it out like that, you're like, "Man, that's a lot that's happening." But in reality, it is very hard. And you have all this momentum. I'm 215 pounds. I have my weight plus the speed going into that brake. If I haven't actually decelerated, I'm not going to be effective in my change of direction. In 135, and then you have 180, 180 is going to be the hardest task. It's the hardest one. Come straight back. So if you think about this vector, I could pick a sport like basketball and say, "What are all the ways offensively that I could potentially change directions?"

Les Spellman

And then you think about, well, how do I work these into my training program? Same with soccer, same with football, and that's what I do. So I have my deceleration pillar, I have my change of direction, which is my vectors, and then it's what decisions do they have to make that then dictate the intensities of these changes of direction. Because if I tell you right now, I say, "Run to me full speed, slam on the brakes, and then run back towards that wall." Okay, you do that, and we measure the forces and the speed and all that. And then we give you a decision to make. "So I want you to run as hard as you can at me, and whenever I clap my hands, I want you to stop and turn back the other way." Well, the second one is going to have higher forces, higher speed. It's going to be completely different action. So it's the same task, but the action's very different based on the perception. And that's what we miss in sports, is that we don't get closer to what the game is.

Les Spellman

Now, that doesn't mean that you should go out and do all this sport-specific stuff all day. Treat it still like a weight room exercise, but start to add in layers of intensity by adding more and more decisions to the point where the gap between your training and the game isn't that big.

Dr. Andy Galpin

Yeah, because at one point, if you make it too sport-specific, you're just playing the sport.

Les Spellman

Just doing the sport. Yeah.

Dr. Andy Galpin

And you might as well just go do the sport.

Les Spellman

Yeah.

Dr. Andy Galpin

Right? So there has to be some-

Les Spellman

And there's downsides of overplaying your sport.

Dr. Andy Galpin

I think Lauren Landau was probably the first person I saw really teaching deceleration.

Les Spellman

Yeah.

Dr. Andy Galpin

And I remember thinking, "What? You have to teach people to slow down?"

Les Spellman

Yeah.

Dr. Andy Galpin

It was never a concept when I was growing up.

Les Spellman

Yes.

Dr. Andy Galpin

It was just like, "Go faster"-

Les Spellman

Yes

Dr. Andy Galpin

... every way. But it sounds like, going back to the agility ladder and those, if you were to Google 10 agility drills-

Les Spellman

Yeah

Dr. Andy Galpin

... almost none of them are going to be agility drills, right?

Les Spellman

No. Yeah.

Dr. Andy Galpin

They're going to be multi-directional-

Les Spellman

Yeah

Dr. Andy Galpin

... but they lack that one. It sounds like, if I'm understanding that correctly, it's that deceleration-

piece that is missing from those classical drills if you're trying to translate that to sports?

Les Spellman

Yeah. The cones could have it, technically, because you could vary the entry speed into a cut.

Dr. Andy Galpin

Yeah.

Les Spellman

Agility ladder by nature won't have it because the task of changing directions, what makes it hard is the entry speed, your momentum. There's no entry speed in a ladder. No, actually, I've seen people do ladder drills where you run-

Dr. Andy Galpin

Like a flying start?

Les Spellman

Yeah. So my friend Tony Villani, who is probably going to listen to this and laugh because he does agility stuff, and it really is legit agility. It just happens to be a ladder there.

Dr. Andy Galpin

Yeah.

Les Spellman

But yeah, there's no entry speed, no momentum.

Dr. Andy Galpin

Are agility drills then always better than change of direction drills?

Les Spellman

No. That's a good point. So you have to weigh the cost of doing them. So the intensity is going to be higher, right? And because the intensity's higher, that means I can't do a lot of volume of it, especially if I'm training closer to training camp and things like that. So if I just continue to only do agility, I've now tacked on a volume of really, really high-intensity work that maybe the athletes aren't going to be able to adapt from because I've given them too much. So I still use change of direction as the base of building the volume of like, most of the early parts of the GPP program are going to be change of direction, not agility. And then you start to dose in agility as the final kind of piece of that. And you do it in a way that's safe and intelligent, and you progress it from different entry speeds. So I guess the things you would make agility harder is how much space are you giving them?

Les Spellman

So if we do a one-on-one drill, and I say, "Okay, here's a whole football field."

Dr. Andy Galpin

Yeah, right.

Les Spellman

"You start on this side. You start on this side." It's going to be high speed.

Dr. Andy Galpin

Yeah.

Les Spellman

But if I say, if I can strain the space and it's a five-yard box by five-yard box, then we progress to a seven-yard box and a 10-yard box, I've progressively increased the intensity. But it's similar to high speed. You can't teach people at high speed. So if I have you run and we haven't talked a lot about speed. I'm sure we'll get to that, but-

Dr. Andy Galpin

We're supposed to talk about that

Les Spellman

My bad.

Dr. Andy Galpin

Yeah.

Les Spellman

So if I have you go out to the track right now, like Stu did with you, Roman, and I say, "Run full speed." And while you're running full speed, I'm yelling at you, "Get your knees up. Put your foot down. Put your elbow here," it's going to make you slower. And it's very similar with agility, where the agility times aren't the time to teach. The change of direction components that we teach, the vectors and all that, that's when we teach. "Ah, you didn't do that right. Put your foot here." Well, you can constrain it because the intensity's lower. You could do a higher volume of it. You can manipulate the entry speed. Well, now I can start to make decisions. There's a couple people out there that are doing a good job with this, like Sophia Nemphius-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... Dr. Sophia Nemphius, has put out a lot of work about this, and what are the constraints of agility, and how do you manipulate the constraints to increase? The constraints that you're putting initially are on change of direction, and then you start to bleed in the agility piece.

Dr. Andy Galpin

Do you have any specific drills or exercises that you like most? Maybe some couple samples-

Les Spellman

Yeah

Dr. Andy Galpin

... that you've really found gravitating towards or away from?

Les Spellman

Let me give you a pyramid of drills.

Dr. Andy Galpin

Love it.

Les Spellman

Okay, so at the base of your pyramid for, this is primarily deceleration, change of direction work, and speed is a whole separate thing, but the base of that pyramid is going to be drops. So think about snapdowns, snapdown, double leg, split stance, single leg. It's all basically vertical work. So I'm not moving-

Dr. Andy Galpin

It's the opposite of most people think about, right?

Les Spellman

Yeah.

Dr. Andy Galpin

You don't care about going up in the air. You're actually kind of just getting a little bit up in the air and working on landing.

Les Spellman

Yeah, landing. Just work on landing. Just boom, braking. The next phase is, Damian Harper calls it braking developmental. I just call it linear developmental. So basically, there's a couple ways to do this. So if you tied a band around your waist, I had a band around my waist, and I'm just pulling you towards me, but you're resisting the pull, and you're taking slow steps forward. You're just micro-stepping. That's a eccentric action that most athletes haven't done at relatively high force, but low speed. So it's an easy way. And then you think about progressing that to faster and faster. So now I'm pulling you faster, and you're stopping. And then I'm pulling you faster, and you're running and now stopping. So we're progressing from low speed to high speed being pulled and practicing the braking action. That's the middle of the pyramid. And then the top of the pyramid is going to be your directional change-

Dr. Andy Galpin

Mm

Les Spellman

... where you could change 90, 135, 180, 45, whatever. And that basically is going to go from a progression of walking and cutting to high speed and cutting. So that's my entire pyramid, and then eventually game speed, which is decisions.

Dr. Andy Galpin

Is this where Dan's rudimentary hops and all that stuff could kind of fold in?

Les Spellman

Oh my God. Thank you for putting that. Okay, so the base could also be jumps, hops, and balance. So Dan Pfaff, if you guys haven't heard of him, again, one of the best coaches in history. Not even just from an opinion, like stats-wise.

Dr. Andy Galpin

Yeah.

Les Spellman

Michael Jordan stats. So I don't even know if he developed it, but he implemented rudimentary hops, and we just call it rudiment. And it's like pogos forward, pogos back, side, single leg, all that, progressing to skips, to bounds, all that. So if you think about what that does for linear speed is it builds the base of being able to go through the stretch shortening cycle really fast. So be able to hit the ground and react and bounce off to the next contact. Train stiffness, trains hip height, all those things. Well, the same is true for change of direction. So if you look at jumps, hops, and bounds, and skips, you could do those in different vectors. So you could do those at a 90-degree vector or 135. So we do a lot of that work in preparation to build someone into a change of direction session where we might do 90-degree bounds, 135-degree bounds, 180-degree bounds. So think about a bound is just left leg to right leg to left leg.

Les Spellman

So you could change the direction, or you could do jumps, so bilateral, bilateral. You could do hops, a left leg to left leg, and we just build those in or get creative with it. But that's the base of how we build the ability and capacity to change directions.

Dr. Andy Galpin

We were talking about the different sports to tennis to To our straight speed, and if we extend that all the way down to 100-meter sprinters

Les Spellman

Yeah

Dr. Andy Galpin

... would you change this approach based on either of those sports, or are the first four or six weeks the same for all those athletes? And the kind of tangential question I'm getting at is if you're a youth sport athlete or-

Les Spellman

Yeah

Dr. Andy Galpin

... a parent, great, you want to do some speed training. You hire a speed coach, and they've got a group of kids, and there's a tennis kid, a hockey girl, a sprinter in there, and they're all doing the same training.

Les Spellman

Yep.

Dr. Andy Galpin

Is this okay? Is this a terrible idea? Is it in between? So that's kind of the genesis we're going. You can answer that in all directions.

Les Spellman

Yeah. No, it's a relevant question because I've actually collected a lot of data on this through our Speed Lab network. So we have 250 facilities that all run kind of the same systems, and we collect a lot of data, so I'm able to see what it means. So anyway, I think most of the training done in these facilities I'll classify as general preparation work. It's nonspecific to any one sport. They're not like a basketball facility, a football facility. They're very general, and I think the main premise of this is to basically touch on all these capacities we talked about, accelerating, decelerating, high speed, vector changes, and all of the athletes do all of that work, especially in that it's primarily developmental athletes, like 12 to 18. Now, to take a step back, I would say track would be a different thing. I think-

Dr. Andy Galpin

Yeah

Les Spellman

... track athletes can do this, but if you look at team sport athletes-

Dr. Andy Galpin

It is the biggest outlier, right?

Les Spellman

Yeah.

Dr. Andy Galpin

Because it is the only one that is literally just saying-

Les Spellman

That's it

Dr. Andy Galpin

... the running is the thing.

Les Spellman

Yeah.

Dr. Andy Galpin

Yeah.

Les Spellman

Now, actually, we do have a lot of track athletes in our programs that do change direction work, and it doesn't make them slower. But anyway, I think the base of doing those things is especially important based around not only just the capacity they need to build, but the environment these kids live in. So when I was 12 years old, I played every single sport that was available. I even did ice hockey. I did basketball. I boxed. I played soccer. I ran track. I did every single sport, and half of them weren't even that organized. It was like, "Just get out there and play." There was no scouts. There was no pressure. It was just like, "Cool, I'm going to go play." When I wanted to have fun with my friends, I walked down the street, I knocked on Brendan's door. "You available? Let's go hoop." These kids don't do that anymore, so the skills that you're missing and capacities that you're missing are huge.

Les Spellman

So I think it is really important as a youth athlete now to go to a training program that builds developmental capacities that are going to weed into soccer and basketball and football and all those things, because your average club team doesn't want you to play two sports now.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

Because they want you to pay that money all year.

Dr. Andy Galpin

Yeah.

Les Spellman

And private equity's in it, too, so they're not playing about it. They want their money.

Dr. Andy Galpin

Yeah.

Les Spellman

They want their money. So it's more than just like, "Oh, we're doing all these things." It's like society has also made us go to the point where we need to develop athletes from the beginning now. Because at 16, I was a relatively good athlete. I wasn't great. I ended up going Division I, but I had been playing tag for 10 years. So I could add some wiggle to me. I could do some things, where your average 16-year-old has never played tag, so...

Dr. Andy Galpin

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Dr. Andy Galpin

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Dr. Andy Galpin

I have four specific questions for you.

Les Spellman

Yeah.

Dr. Andy Galpin

And then I promise we'll do speed.

Les Spellman

Okay, let's do it. Yeah, this is the first quarter of the podcast, by the way.

Dr. Andy Galpin

Yeah. Maybe these can be quick hitters. Quick hitter number one, what is the difference between when someone says something like an athlete is fast versus quick?

Les Spellman

If you were to ask a researcher that, they'd be like, "I've never heard of quick." But because I live in a world where I talk to parents all the time, they're like, "He's quick," meaning he could change directions really fast and get open. And fast means you can run fast. So I think those are words that people have created, but they don't really have a basis. To me, fast means you can create separation, you can get open, you can close space, you can do all those things. So I don't know. Yeah.

Dr. Andy Galpin

The way I'm going to translate your answer is fast is probably that top-end speed.

Les Spellman

Yes.

Dr. Andy Galpin

Right? Like really 100-meter sprint, where if you hear the word quick or if you're wanting to be a quick athlete, I think you should go back and listen to all the advice you gave on acceleration.

Les Spellman

Yeah.

Dr. Andy Galpin

Change of direction. That's- That is really what you probably mean when you say quickness.

Les Spellman

Yeah.

Dr. Andy Galpin

Is that fair?

Les Spellman

My goal is to merge that word into just fast. So if we were to redefine-

Dr. Andy Galpin

Oh

Les Spellman

... what fast is today, it would be merging those two words because I don't like the word quick. Because they're both expressions of speed. Because remember, speed is a capacity, but it's also an expression. So my version of a definition around speed and being fast includes the multidirectional spectrum. So my goal is to merge those two.

Dr. Andy Galpin

Second quick one.

Dr. Andy Galpin

False step.

Les Spellman

Mm.

Dr. Andy Galpin

This is going back to our childhood a little bit.

Les Spellman

Yeah.

Dr. Andy Galpin

I remember countless clinics being told to not false step, and I remember thinking, "This is the most uncomfortable-

Les Spellman

Yeah

Dr. Andy Galpin

... ineffective thing I've ever done," but I did it nonetheless, and then as soon as the coach stopped looking, you go right back to your false step and run.

Les Spellman

You're right back to it.

Dr. Andy Galpin

What is the false step? What the heck are we talking about, and-

Les Spellman

Yeah

Dr. Andy Galpin

... where do you stand on it?

Les Spellman

A good example would be stealing a base in baseball, and a false step would mean you lift the front foot, then put it down, then go forward to then steal a base. A non-false step would be keeping that foot planted and crossover stepping into it. You look at base stealing, they all false step. And you look at NFL receivers, they're lined up in their stance, and they say, "Don't lift that front foot. Keep it nailed down." Well, most of the good ones do it.

Dr. Andy Galpin

Yeah.

Les Spellman

So I think it's another symptom of people watching the TV and saying, "Oh, you shouldn't do that," but there's no basis behind it. There's no research behind it, because all the good athletes do it. And sometimes as coaches, we feel the need to overcorrect and be like we see something. That's our value is to interrupt people. "Ah, don't do that." Similar to when they say, "Stay low when you run." And you've probably heard that, and you probably don't know the context of why I think that's wrong, but there's a lot of wrong to that. A whole lot of wrong.

Dr. Andy Galpin

Tell me more.

Les Spellman

Yeah, okay. So if I'm teaching someone how to accelerate and I say stay low, what it does is it makes them compress down, which basically kills their ability to extend the hip because all their weight is forward, and they've basically lost balance essentially is what's happening. Now, Stuart McMillan has said, instead of stay low, is project your body up and out.

Dr. Andy Galpin

Lean forward.

Les Spellman

Yeah. So you remember you did speed training as a kid and they were like lean, fall, run?

Dr. Andy Galpin

Yeah.

Les Spellman

So there's a-

Dr. Andy Galpin

It's the slowest start possible.

Les Spellman

Slowest start possible. There's a big difference in how you accelerate from propulsion and hip extension than how you would fall into start. So I think things like that is there are things that we see that we think are right, but then somebody comes and dunks on us with research, and it's like, "Ah, it's actually not true." And then people fight on Twitter for five years if it's true or not, but you realize that, no, this is a fact. This isn't a guess. This isn't an opinion. This is a fact. It's the worst cue you could tell somebody is stay low. Project your body up and out like a rocket or like a plane taking off. Those things are real. But in reality, you actually never want to stay low. Okay, I'll give you an example. I shouldn't say you never want to stay low, but this is an argument I have with every single draft pick I've ever had. So the first five steps in the 40, first four steps are the most important part.

Les Spellman

60% of your speed is created in four steps. Maybe even 70%.

Dr. Andy Galpin

Ooh.

Les Spellman

Yeah, it's insane. It's a large amount. Okay? Now, if you watch every single guy that I've trained over the past 10 years accelerate on day one, their torso is in the same spot in their first four steps. It's never like, "Oh, you're not low enough." Almost never, because they've all been told stay low. So if your torso is in the same position for four steps, what happens is you've limited your ability to create an effective hip extension and an effective ground contact. You're interrupting your process. So what is the right way? The right way is that your torso should rise every single step. Every single step that you take, your torso should rise incrementally. And you watch this in the Olympics. You have to grab a video that's slow-mo or video it on your phone and then look at it. What you'll see is from the blocks, first thing that they do is their shoulders rise. Their shoulders have to rise so they can create a bigger projection.

Les Spellman

If they don't rise, you're limiting how much hip extension you can get, which is the primary driver of acceleration. So their shoulders rise, and then their shoulders go forward, up, and out, and every step they take, their shoulders rise. Now, as an Olympic sprinter, an Olympic sprinter can accelerate and keep their torso rising for about 16 to 18 steps.

Dr. Andy Galpin

How many-

Les Spellman

60-something yards.

Dr. Andy Galpin

60, okay.

Les Spellman

They can accelerate to 60-something yards with their torsos rising 16 steps, 18 steps, 30-something meters.

Dr. Andy Galpin

So in 100-meter sprint, they're not even hitting peak speed until at least halfway through the race.

Les Spellman

Oh, past that. 70 is when they hit-- If you see the 27 miles per hour, it's like 70 yards, 70 meters, sorry. I'm American, so I say-

Dr. Andy Galpin

No, that's close enough

Les Spellman

... yeah.

Dr. Andy Galpin

Yeah.

Les Spellman

But what it also tells me is that their torso rises way sooner, like 30s, like 30 meters in, which means they're still accelerating with their torso upright.

Dr. Andy Galpin

Oh, wow, okay.

Les Spellman

Does that make sense?

Dr. Andy Galpin

Yeah.

Les Spellman

So you've come to fully upright.

Dr. Andy Galpin

That's not at all what's supposed to happen, right? Theoretically-

Les Spellman

That's not what you would think.

Dr. Andy Galpin

Correct.

Les Spellman

You wouldn't think that, but-

Dr. Andy Galpin

You would think you have to still be that forward lean to be accelerating.

Les Spellman

No.

Dr. Andy Galpin

But you're actually-

Les Spellman

Because accelerating just means your speed's increasing.

Dr. Andy Galpin

Got it. Okay.

Les Spellman

So if you get to 30-ish meters, 35, guys go different depending on the person.

Dr. Andy Galpin

If we lost you in the jargon here-

Les Spellman

Yeah

Dr. Andy Galpin

... one second for everyone. The typical way people would think about this would be at some point, if you're running fast, you're vertical, right?

Les Spellman

Yeah.

Dr. Andy Galpin

And you get your maximum speed when you're totally vertical.

Les Spellman

Yeah.

Dr. Andy Galpin

You accelerate into that, right? So you stay low, and eventually, you gradually get taller and

taller, and the idea roughly, which you just dismantled, and that's wonderful, is Once you reach that true vertical position-

Les Spellman

Yeah

Dr. Andy Galpin

... older folks think Michael Johnson-

Les Spellman

Yeah

Dr. Andy Galpin

... the great sprinter who would lean back-

Les Spellman

Yeah, lean back. Yeah

Dr. Andy Galpin

... at some point. But the basic thought was, my whole thought actually, that I've just learned is not appropriate, is that once you've got that vertical position-

Les Spellman

Yeah

Dr. Andy Galpin

... that's when you're at top speed. And what you're saying is good sprinters will actually be in that vertical position and still-

Les Spellman

And still climbing

Dr. Andy Galpin

... be speeding up for a while.

Les Spellman

Still climbing.

Dr. Andy Galpin

Wow.

Les Spellman

For a while. Well, because if you think about it, and I'll come back to the drive phase and the stay low point in a second, but okay, so if you think about it, let's say you're upright at 30 meters. You can really only hold speed, like your peak speed, for a second-ish. Like-

Dr. Andy Galpin

Really?

Les Spellman

Yeah. So that means you would hit your top speed at 40 meters, and then you would have 60 meters-

Dr. Andy Galpin

To hold

Les Spellman

... to hold it, and you're not-- Now, there is deceleration in the 100 meters. No one hits ... If they hit it at 70, that means they decelerated less, meaning they only, by 80, they're decelerating the last 20-

Dr. Andy Galpin

Yeah

Les Spellman

... which is better than hitting it at 40. So part of the strategy of running the 100 meters is being able to accelerate to upright and then continue to accelerate while you're upright.

Dr. Andy Galpin

Accelerate as long as possible.

Les Spellman

Yeah.

Dr. Andy Galpin

Yeah.

Les Spellman

So it, okay, so-

Dr. Andy Galpin

So you don't get Usain Bolted.

Les Spellman

Exactly.

Dr. Andy Galpin

Because that's how he won, right?

Les Spellman

Exactly.

Dr. Andy Galpin

He had the ... Is that correct? Like, he had at least-

Les Spellman

He had a longer acc- Okay, Noah Lyles won the Olympics. He had a longer acceleration phase than everyone else, which means he continued to raise his speed. He also had the highest top speed because he was able to accelerate longer.

Dr. Andy Galpin

Yeah.

Les Spellman

So if you're accelerating, you're gaining speed.

Dr. Andy Galpin

Yeah.

Les Spellman

Decelerating, dropping speed. So he could accelerate longer.

Dr. Andy Galpin

Yeah. And-

Les Spellman

Strategy

Dr. Andy Galpin

... if it's true, I believe Usain used to be able to hold that top speed-

Les Spellman

Longer

Dr. Andy Galpin

... the visual here would be he's sort of behind the packer right there, and then it looks like he accelerates the last 20 or 30 meters when he blows by everybody.

Les Spellman

Yeah.

Dr. Andy Galpin

But he's really just staying closer to his top speed when everyone else is slowing down.

Les Spellman

Exactly.

Dr. Andy Galpin

Was that real?

Les Spellman

And part of that is mechanics. Part of that is we'll get into the mechanics conversation. Is it important, is it not? But he had a very effective strategy that allowed him to not only accelerate for a long time, but once he got up to speed, he could hold his speed because the efficiency of his stride, and it was a bigger stride. So okay, let's say a good sprinter can raise their torso in 16 to 18 steps. Nobody that any of us coach are that good of sprinters. Okay? So when I get guys and they're 4-2 guys, 4-3 guys, we're looking at 10, maybe 12 steps before they raise their torso. That'll take them to about 23 to 24 yards in a 40. Okay? Then you have to finish that thing. So you're saying the best guys can do that. Your average high school kid can probably only accelerate six to eight steps before their torso's coming up.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

And we're teaching kids to look like Usain Bolt, who could hold it for-

Dr. Andy Galpin

Copy that

Les Spellman

... 16 to 18. So what happens is you have these coaches that watch the Olympics and they're like, "All right. You get little Johnny over here" ... and you're like, "You need to hold your torso down, you need to stay low." But it's actually the worst advice you could give, because you should actually teach him to raise his torso incrementally, not all at once, but to find a starting point and then raise it incrementally every step, and then continue to accelerate once you're upright. That's a better way to teach. So that's the number one thing I have to break when I get guys in draft period is like, "Bro, you can't accelerate 13, 14 steps with your torso down. You need to bring your torso up at seven, eight," which would be a lineman, or nine or ten, which would be a big skill, or maybe 12, which would be a skill guy. And if you see me coaching guys during the combine, it's like-

Dr. Andy Galpin

I have seen you actually literally do this.

Les Spellman

Yeah. In between reps.

Dr. Andy Galpin

Yeah.

Les Spellman

Take it to 12, and they know exactly what I mean because they came up at 10. Two more steps.

Dr. Andy Galpin

And so you have that individualized for the guys.

Les Spellman

Oh, yeah. Very individualized. Now, do you need to do that for your average team sport athlete? Please don't. But for the combine, yeah. Devonte Velie was never going to make it in the NFL because he was 25-ish years old, and he went on a Mormon mission, and he's too old to be a rookie. And basically, they're like, "Hey, you're 6'5" for 230 pounds. If you ran fast, we'll give you a shot." The dude ran 4.47, and now he's one of the leading receivers in the NFL. He always had the talent, but the entry point's the NFL. So if you don't run-

Dr. Andy Galpin

Yeah

Les Spellman

... the combine, if you don't run fast at the combine, you're not getting the shot to express your skills. So that's why my job in that space is so critical at times.

Dr. Andy Galpin

I think a few seconds ago, I told you I had four questions. That's a total lie.

Les Spellman

Yeah, let's go.

Dr. Andy Galpin

I have a bunch more before we get there. Are there any other of those clichés about acceleration, about starts?

Les Spellman

Yeah.

Dr. Andy Galpin

Maybe one example I'll start you with. There is generally two things, two approaches to starting.

Les Spellman

Mm-hmm.

Dr. Andy Galpin

There's either the choppy step-

Les Spellman

Yeah

Dr. Andy Galpin

... which is start and get your feet down in the air as many times as you possibly can.

Les Spellman

Yeah.

Dr. Andy Galpin

The rationale there being as you start, you have to overcome the most inertia.

Les Spellman

Yeah.

Dr. Andy Galpin

Acceleration's a challenge, right?

Les Spellman

Mm.

Dr. Andy Galpin

So re-get the foot into the ground.

Les Spellman

Mm.

Dr. Andy Galpin

Because when your foot's in the air, you're not putting force in the ground.

Les Spellman

Yeah.

Dr. Andy Galpin

The other approach is the opposite. Longer, more propulsive jumps there.

Les Spellman

Yeah.

Dr. Andy Galpin

Where do you stand on that, or does that even matter?

Les Spellman

Yeah. So you think about stride length, stride frequency, they're actually ruled by kinetics, forces. So your ground time is going to be how much force you can produce and the time you can produce it that then takes you forward. And then the other one, a lot of people don't think about stride length is like, well, to create a good stride length, you don't reach, you don't over push. It's actually going to be your takeoff velocity on the ground. If you create a bigger takeoff, because velocity, distance, and time. So if I create distance-

Dr. Andy Galpin

Yeah

Les Spellman

... right? So-

Dr. Andy Galpin

So instead of getting the distance by reaching my limbs, I should be floating more.

Les Spellman

Yeah.

Dr. Andy Galpin

Flying more.

Les Spellman

It's an extension moment.

Dr. Andy Galpin

Yeah.

Les Spellman

Yeah. So I create extension, which then pushes me forward. Okay, so then if it's ruled by forces and- What rules of force your body and the capacities that you can create, that's going to dictate a lot of how you run. Basically, what I'm saying, your structure of how you're built, body fat, height, weight, and you could expand that out to joint range of motion, everything else, injury history, whatever. And then you look at the next phase, which is how you produce forces. Can you produce high forces? Can you produce fast forces? Can you do it symmetrically? Okay. That's the basic version. There's other ways to do it. And then you look at the top of it, like as coordination. So when I coach, I don't coach the top of the pyramid, I coach the bottom of the pyramid. If you can manipulate someone's body fat and weight, dude, the structure is important.

Dr. Andy Galpin

Yeah.

Les Spellman

Yep. Okay, so there is a optimal stride pattern based around the base of the pyramid, your structure and your physical force, and how you produce force. So if I see an athlete that's 5'8", his frequency will probably be higher than the guy that's 6'8". My brother is six foot eight. I'm five foot ten. My brother is a better athlete than me, and he's got a bigger stride length. My stride length was significantly shorter, but I was really strong, so I was able to hit the ground, push, hit the ground, push, and do it frequent. These things are deterministic, and that's where, as coaches, we think everyone should look like Usain Bolt and Justin Gatlin and Asafa Powell. Well, you're taking a very small population of the most genetically gifted humans that are very, very similar to each other in a lot of ways, that all express the same things because they train in similar ways and you can't do that.

Les Spellman

The high school athlete that you have might look completely different from Usain Bolt and Asafa Powell, and they may not have as much extension. But if you're going to change something, you're going to have to change initially the structure or the physical part of how they produce force before you could even tap into the coordinator stuff and technical. So anyway, long story, you end up with four different types of athletes, and this is all based on James Wild's research. James Wild was archotyping athletes as pushers and pullers, and Stu McMillan was doing pushers and pullers. And pushers and pullers were kind of like a basic classification, similar to what weight room was like. You're elastic or you're strong. And it's overly simplified, but it's somewhat true, somewhat not true. So the pushers would have this really big push moment and big extension. The pullers were more like cycle the leg through.

Les Spellman

So if you think about high heel recovery, low heel recovery, okay, that debate. James and Stu and these guys were like, "Ah, that's not right. We see significantly different types." So first thing they did is like, okay, let's take spatial-temporal variables. There's four. There's step frequency and step length. So let's look at the relationship of those two. So you could take an athlete and say you're more step length dominant, like my 6'8" brother, or you're more step frequency dominant like me. Then you have ground and air. Do you spend more time on the ground or more time in the air? Are you a air runner or a ground runner? Okay, so then you end up with four different types. If you plot step frequency and step length on the X, and you put ground time and air time on the Y, you end up with four quadrants. So in the top left quadrant, you have a bounder, and a bounder is going to be step length and air time.

Les Spellman

So think about it, they take a really big step length, they float through the air, and they create this big moment in the air. And it's like what my brother did at 6'8". He would run down the basketball

court in five steps, I'd take 55 steps. Very different. Okay. Then you have the next quadrant over, which are drivers. So they create a really big step length, but they do it from the ground. So they create this really big extension moment, and they create this really big step length, but then they hit the ground right away. They don't float through the air. It's a very different strategy. Then at the bottom right, you have spinners, and these spinners are extremely frequent. Ba-ba-ba-ba-ba. But it looks like they don't ever leave the ground. Running backs, Jahmyr Gibbs, all them dudes, right? You see them ba-ba-ba-ba-ba. They just stay on the ground. And then the final one is you have a bouncer who's going to be frequent, but air-based.

Les Spellman

Ba-ba-ba-ba-ba. But they're above the ground. And I could go on this for 17 hours, but the research says there's different types of athletes, and basically, the way that you are built and the forces that you produce could potentially lead you into one of these quadrants. And within these quadrants, you could be very deep into that strategy. Like Galcao, he's a Australian sprinter and-

Dr. Andy Galpin

Unbelievable

Les Spellman

... or you could be somewhere in the middle that's kind of hard to tell where you're at. And if you're somewhere in the middle, that means your strategy's pretty stable and you're probably healthy, and it's not going to tell you if you're fast or not. It just means you're relatively healthy. But if you're all the way outside and you're in that red zone, way deep into that strategy, you're probably more at risk for injury because you're an outlier. You're utilizing something too much, which probably makes you good at what you do. Usain Bolt, definitely outlier. Galcao, outlier, but there's a risk associated with that. So anyway, the original question was should you go really quick with your steps or really big with your step? It's all dependent on the structure, how you produce forces, and how you coordinate all that together. Think about structure is more like base of your house and all that stuff, and then the middle, or the forces, is how you decorate it and all that stuff.

Les Spellman

And then the final part is how you show up in the house and dance in it. It's very-

Dr. Andy Galpin

Yeah

Les Spellman

... expressive. It's the dancer.

Dr. Andy Galpin

When you archetype these people, is that influencing how you're training them?

Les Spellman

1,000%. Well, the first question I get, and mind you, I didn't create this, it's just something we've read the research on and then implemented with hundreds of athletes at this point, and the first question we get is should you change your strategy? So if you're a bounder-

Dr. Andy Galpin

Yeah

Les Spellman

... should you move to a driver? Well, not necessarily. So we did a study, 25 athletes, and we did the archetypes on all 25 athletes. And you have outliers in every direction, but basically, we were like, "Okay, let's find a population of people who run exactly the same speed." So 4.4. So we took four athletes that ran 4.4, and they were all different strategies. They ran the same speed, but they got there-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... four different ways. So then what we did is we were like, "Okay, let's look at the physical qualities that they possess individually and how it may have influenced." So your boundaries were really elastic and-

Dr. Andy Galpin

Have to be, right? Yeah

Les Spellman

... your bouncers were really reactive, and your drivers were really strong, and then your spinners had really good hip extension strength. So, there was all these things that we started to find. But within that context is should you change it? So you wouldn't change it because they're in that strategy based around how they're built and their physical qualities. But if it's a risk, like let's say there's green, yellow, and red. Green would be close, yellow would be 1.5 standard deviations, so a little bit abnormal, red would be two standard deviations away from the norm. If I'm in the red, kind of want to just pull you back into the green because you're probably good, if you run 4.4 and all that. You just need to be a little bit more stable in your strategy. So, if you're a bounder and you have this really big step length and create this really big moment out the back, there's a couple of risks with that.

Les Spellman

So one of the risks would be how you crash into the ground.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

And how you hit the ground. So if we made you a little bit more reactive and did some reactive work, we could potentially influence the way that your technique changes-

Dr. Andy Galpin

Via-- Oh, okay. All right. So you're saying-

Les Spellman

... via physical tools

Dr. Andy Galpin

... make you more reactive via training.

Les Spellman

Training.

Dr. Andy Galpin

Not changing stride length or-

Les Spellman

No. You can't. Well, how would you change it? Because remember, changing stride length and stride frequency is based around forces. So if I manipulate forces, I could change those two things. I can't do it from the coordination standpoint. Now, maybe that's just me, I'm not a good coach at that level, but I would argue Dan Pfaff and all those guys manipulate strides and those things through drills and physical things in the weight room.

Dr. Andy Galpin

Yeah.

Les Spellman

Or else the weight room wouldn't matter for speed. It definitely matters for speed. 1,000% matters. So yeah, if I want to manipulate somebody away from a strategy, there's physical things I could do, and technical things, drills, all that, and we'll get into that conversation, but the primary way is the natural way is going to be progressing them through training to get them to switch. Now, again, going back to this, every strategy has its own risks. So, like a spinner, if you think about a spinner is really strong but may not create the biggest extension moment-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... because they're really strong, but they're also trying to get back to the ground. So the co-contraction is really high. Well, they tend to have a lot of anterior hip issues because of that, and they would have hamstring issues because they co-contract really fast and get back to the ground, but they didn't really create a lot of space, so they end up swinging that leg out in front of them to create a bigger stride length. And in that moment, that eccentric moment, tends to be some of the problems they have with spinners, is they have hip stuff and hamstring stuff. So anyway, you have all these quadrants and you have all these performance things and risk things, and your job isn't to move a spinner to a bounder, it's to first protect their strategy, and then second, is it risky? Should I move them more towards the middle?

Dr. Andy Galpin

Yeah. Today's episode is sponsored by LMNT. 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. You have a school of thought that I have to take the bait on. You want to get faster, all 90%, some large percentage, maybe all, is running.

Les Spellman

Yes.

Dr. Andy Galpin

But tell me, and defend your position, sir, how is deadlifting, how is lifting weights, how is that actually going to make me faster on the field-

Les Spellman

Yeah

Dr. Andy Galpin

... Coach?

Les Spellman

There's arguments, and I'll address these arguments from the jump, that some of my fastest athletes don't lift weights, or these guys aren't weight room guys, but they're fast. There's always outliers. But in order to be fast, I know three things are true. I have to produce extremely high forces. There's a bunch of ways I could train my body to produce high forces.

Les Spellman

I could do, I think, the research, or not even research, coach research in early 2000s was get your trap bar deadlift to 3.2 times your body weight, and you'll-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... or squat-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... a certain amount, which has been disproven. But that is a thing that if you don't have a basic layer of strength, you're not going to Potentially be fast. Now, are some people born with the ability to produce high forces? Yeah, for sure. The second thing is probably the more important thing. It's how fast can you produce force? Do you have high forces, then you have fast forces, and then it's also recycling that over time. So it's creating a stride length and being able to attack the ground and some coordination pieces to it. But my argument is that the track, if you were just to do track, trains elements of those, but it's primarily going to be your fast force, like how fast you can produce forces. But that's going to be severely limited by your total capability to produce high forces. So if you can produce higher forces and transfer that to your system, your tendon system, you're going to be faster.

Les Spellman

And I think number one, the weight room can build those capacities and help you then transfer it to track. But also, the weight room can be a restorative tool. So we think about tendon remodeling. We think about creating a bigger stride length through creating more range of motion between the thighs-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... and things like that. You could do a lot of that in the weight room, not just from stretching, but from putting yourself in deeper ranges of motion and position. So the third piece we add in is slow force. So slow force would be like your eccentric component to things. Now, all three of those help my athletes run faster. I do have some very gifted athletes, but the majority of them are really good football players that are average, a little bit above average athlete, and we're developing them into robust athletes from doing weight room stuff. And thinking about the speed thing is there's a balance between how much we're doing, depending on the time of year, but we can't just make you faster from going out and running fast. We can't. We have to support your ability to continuously run fast and train harder and build the capacity to actually even do the training, and part of that is the weight room.

Dr. Andy Galpin

Why can't you just run faster?

Les Spellman

Yeah, so you could do a couple things to overload just on the speed side, like assisted running and those things. So that would take you into overload that would allow you to potentially run faster. But your system may not be able to support that level of super maximal speed because you haven't built the physical structure behind it, your ability to produce higher and higher forces. So in order to do that, you have to build the capacity, and our weight room is extremely supportive to developing those capacities that then are expressed out on the track or field safely and over time. And anyone can make this argument. If you do just speed stuff, your guys are going to get faster, but at a certain point, they're going to begin to break. You haven't-

Dr. Andy Galpin

Mm

Les Spellman

... developed the tissue quality. You haven't developed the ability to produce those forces that will sustain them long term. So it changes from, yes, weight room builds capacities and helps you perform better, but it also supports the work that you're doing on the track or field. And if you don't do it, there's going to be a point where you're not supporting those things well, and you're going to run into issues like groin issues, hamstring issues. Not saying those things are 100% preventable, but the soft tissue, non-contact stuff, we try to think of it as the field is we're building, we're going, but the weight room is going to allow you to continue to do the field stuff at a high level.

Dr. Andy Galpin

Coach, I asked you to get faster.

Les Spellman

Yeah.

Dr. Andy Galpin

And then you told me about strong.

Les Spellman

Yeah.

Dr. Andy Galpin

Connect the dots for me there. Why-

Les Spellman

Yeah

Dr. Andy Galpin

... was so much of your answer there force, force, force, when I told you I wanted velocity?

Les Spellman

Yeah. Well, number one, we're driven from kinetics and kinematics. So kinetics are how we produce forces, and kinematics is our body, like how our body is and how it moves. And I think a lot of times, the word force is correlated with strength.

Dr. Andy Galpin

Yeah.

Les Spellman

You know what I mean? So if you were to say force to your average high school kid, they're thinking, "Oh, what's my back squat?" Well, you can produce extremely high forces and not have muscular strength at the level you would think. So a good example would be is if you did a depth drop off of a high box, let's say it's 42 inches, and you measured that force. Well, that force is greater than what you would produce in a back squat.

Dr. Andy Galpin

Oh, yeah, significantly.

Les Spellman

Significantly. And same thing-

Dr. Andy Galpin

Because you got a 10X factor of gravity.

Les Spellman

Exactly. So if you think about it, it's like, well, force is two things. It's mass and acceleration. And if you think about how I manipulate that, so weight room could mean high loads, but it also could mean high speeds. And if you think about my ability to produce force is not just going to be my muscular system, it's also my tendon system and how I coordinate that on the track. So building these qualities, it's like, man, we just have to stop playing the semantics game-

Dr. Andy Galpin

Mm

Les Spellman

... and thinking it's just getting a higher number on the bar. It's not that. It's finding unique ways to get high forces. And in that case, let's say you did a couple depth drops from 42 inches and measured that force and did a couple back squats and all those things. Well, which thing is going to transfer more to sport? It's not going to be the back squat. It's going to be the thing that has the ability to produce higher and higher forces. And so basically, in training, what we're trying to figure out is, well, how do we hack that system? Eccentric is one way because you're producing higher force than you are concentrically. Isometric is one way because you are producing high forces, but you can sustain it for a period of time, and there's less cost to it. You can do the isometric work, and it's not the same cost of doing a back squat and things like that. So you're basically hacking the system.

Les Spellman

It's like, where can I fit this in and expose the system to- Not only produce high forces, but accept it. It's like, okay, we're moving in this direction of increase for our system, and the body starts to recognize that pattern, and it just continues to get better and continues to get better. And we've seen it from not only a acceleration and high speed standpoint, but deceleration standpoint. So if I'm going into teaching the body to accept four times the body weight in a single step as I decelerate, I can't just throw people into that and expect them to be able to do that well. We have to build the capacity, and that's where the weight room. And to be honest, I think a lot of people think the weight room is squat, clean, deadlift.

Dr. Andy Galpin

Yeah.

Les Spellman

Which I understand, and yet we still do those things, but we're thinking of the weight room as a force center. And if we want to produce high forces, fast forces, and symmetrical, our exercise selection is now going to be based around force, not just load and weight. So it's a little bit different thought process into it, but our outcome is we want to do that so that we can transfer that over onto the field.

Dr. Andy Galpin

Well, I'm going to blame Stu for not telling that- ... Sharon making you learn that earlier. That's his-

Les Spellman

True

Dr. Andy Galpin

... fault.

Les Spellman

100%.

Dr. Andy Galpin

That's our mentor, so. But this is why he's too old, and the field has passed him by.

Les Spellman

He's like, "Yeah, you're just an idiot." Yeah, that's what he tells me.

Dr. Andy Galpin

It sounds like to me, maybe this can be thought of more colloquially as some version of combination of plyometrics-

Les Spellman

Yeah

Dr. Andy Galpin

... with traditional stuff. So I want to ask you about how you integrate plyometrics-

Les Spellman

Yeah

Dr. Andy Galpin

... in both acceleration and speed.

Les Spellman

Yeah.

Dr. Andy Galpin

I also want to ask you about how much you're integrating strength, like heavy training because-

Les Spellman

Yeah

Dr. Andy Galpin

... heavy lifting. So we'll call this not the force side, as I've learned from you.

Les Spellman

Yeah.

Dr. Andy Galpin

This is not force training, but that more traditional thing of what someone would think of, heavy load lifting.

Les Spellman

Yeah.

Dr. Andy Galpin

So how are you playing with both those factors with the desire to be acceleration-

Les Spellman

Yeah

Dr. Andy Galpin

... as well as speed?

Les Spellman

Yeah. Okay, so initially, when I was doing training, and I was doing it wrong, I was competing a lot-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... between what we did on the field and what we did in the weight room, and they're both competing to be the strongest one, and we failed the athlete at the end. So what I started to think about was, well, how do I share the load across the field and the weight room? The first thing we did is we take our jump, hop, and bound volume, and we think, what do we have planned in the weight room and what do we have planned on the field? So we always do jumps, hops, and bounds on the field. Basically, we think about it as like it's preparatory work that's then going to lead into the field work. So if I'm doing acceleration, I'm going to do horizontal jumps, I'm going to do horizontal hops, I'm going to do horizontal bounds. But it's going to be pre-training, pre-sprint, so it's going to be in relatively low volumes. So we'll do five broad jumps or four step bounds five times, not a ton of work, and it's primarily just in preparation.

Les Spellman

So that's not our most intensive work.

Dr. Andy Galpin

So this is a full warm-up, and then you're gradually getting closer to full speed kind of thing-

Les Spellman

Yeah

Dr. Andy Galpin

... but with those plyometrics.

Les Spellman

So think our structure's always the same. You have a pre-session, you have a warm-up, then you have potentiation. Potentiation is the work before you go to the actual work. So think of it as jump, hops, and bounds, more extensive, low volumes, and then we move to our actual work, which would be-

Dr. Andy Galpin

And this is 80% effort, 90%, 100%?

Les Spellman

Yeah. I would say we're not measuring, so it's-

Dr. Andy Galpin

Of course

Les Spellman

... probably 80%. Because remember, the main work is we want to sprint.

Les Spellman

First of all, I'm not going to spend a lot of time there, and second, it's just preparatory. It's like you finish a warm-up. In the warm-up, you always do sprints, and then you have to get the nervous system to really start to understand we're going to do some really aggressive things here. And we progress it as jumps, which is the lower intensity, all the way to bounds, which is higher intensity and more specific, and then we move on to the sprint work. So we're not getting a crazy intensity on the field in terms of jumps, hops, and bounds. Where would we get that from? That's where the weight room. We're going to do drops from high heights. We're going to do things like that, or rebound jumps. That's where we train the intensity side of the equation, and less specific to sprinting. We're probably not doing bounds in the weight room, so we'll do bounds on the field. But when we think about the plyometric side, it's just going to be like we're going to manipulate how much time we're in the-- How much time we're falling, things like that, and are we rebounding to another box or single leg, whatever.

Les Spellman

That's going to be weight room-based. Yeah.

Dr. Andy Galpin

Okay. I see.

Les Spellman

That's going to be weight room-based. So the stress-

Dr. Andy Galpin

Oh, got it

Les Spellman

... shifted from-

Dr. Andy Galpin

Clever

Les Spellman

... trying to capture that on field, to then attacking that part in the weight room and putting the stress there, and letting the field stress be the velocity side. Basically, we teach very little on the field. We don't interrupt the process of running fast. We try not to. We'll build the main block of training so that they get the speed work in, and then we get out of there, and then we train some of the intensive moments around that in the weight room.

Dr. Andy Galpin

So this is a two and a half, three-hour session?

Les Spellman

No. We rarely go over an hour on the field. Rarely.

Dr. Andy Galpin

Total?

Les Spellman

Yeah. And then the weight room is 45 minutes to an hour. So in total, we're usually under two hours in total for everything.

Dr. Andy Galpin

Wow.

Les Spellman

Yeah.

Dr. Andy Galpin

And 15, 20-minute warm-up, 10 minutes jumps and sprint. So it's a pretty low pace. I don't know if I'm-

Les Spellman

Yeah

Dr. Andy Galpin

... thinking about that correctly.

Les Spellman

So for traditional speed sessions, what are the things that take time? It's usually coaching. It's usually me going through progressions of drills and coaching. So if you were to X out some of the drills and coaching and do the work, the actual amount of work that you're doing Not a lot. There's only so much high-speed, high-quality sprints you can do. It's very similar to if like a foreigner that watched NFL for the first time and said, "Why is there so many breaks?" And they added up all the time the ball was in play, it's six minutes, and they're like, "There's six minutes of play in this, and my sport has 90 minutes of play."

Dr. Andy Galpin

Yeah.

Les Spellman

It's a very different thing. So anyway, if you X out all the filler stuff, it's like you're actually doing a lot of stuff that isn't very intense. So drills, like all the A series, and switches, and A skips, and I used to coach that for 20 minutes. And it was like, okay, well if I reduce that or cut it, how much time do I actually have to do the sprint work? Decent amount of time. So 12-minute warm-up, three minutes of potentiation, you're at 15 minutes. And if you have an hour session, you have 45 minutes to do resisted, assisted, high speed with good breaks. You have more time to do it.

Dr. Andy Galpin

Why not cut the rest time down and get that whole hour session done in ... I mean, if you're only doing 10 or 15 reps there, why not get the whole thing done in 30 minutes and get out of there?

Les Spellman

Yeah, no, exactly.

Les Spellman

I get that once a year from a rookie. Like, "Why do we have to wait four minutes?" Well, you're not training speed if you're not allowing your system to recover in between sprints. So if I hit a maximal sprint, and I'll save you the chemical and biomechanical reasons, but if you run a full-speed sprint and you hit 100% of your velocity, it takes a decent amount of time to reset your system to be able to do that again and reach near that speed. So if you run 21 miles per hour and your capacity is 22 miles per hour, that's a relatively high percentage of your max speed. You can't just repeat that again. You're going to hit 20 miles per hour, 19 miles per hour, 18. So what we're trying to extract out of the session is extremely high-quality reps. And in order to do

that, we have to give them decent rest times, or else they're not going to express it. So there's also this other debate on contrasted sprints.

Les Spellman

So if you-

Dr. Andy Galpin

Mm

Les Spellman

... run resisted and then go unresisted, the unresisted should be faster and faster. I've found a little bit of a lack of coordination coming from resisted to unassisted, so there's times where we will do it in preparatory phases, but if we're trying to run fast, we'll do a small block of resisted work, take a break, and then do our actual unresisted work, which is going to be our quality. So I've stopped using the do resisted all the way throughout the session, and also the resistance is a lot less than what people would think. We're not going heavy, heavy resisted anymore. We're like medium to light, especially for skilled players. But that resisted work is early on in the session, and it's essentially preparatory for the later work, which is essentially going to be higher speed stuff. So if you think about the design of a session, excluding all the stuff you do before a session, you have warm-up potentiation, resisted, unassisted.

Les Spellman

That shouldn't take more than an hour. And then if you want to build qualities, you have the opportunity to attack some of those qualities in the weight room. Yeah.

Dr. Andy Galpin

Yeah, Coach, but you're going to set me up for failure here because I don't have five minutes between plays.

Les Spellman

Yeah.

Dr. Andy Galpin

I need to be able to repeat it every 30 seconds.

Les Spellman

Yeah.

Dr. Andy Galpin

So your speed training's garbage.

Les Spellman

Yeah, so then you would have days that are primarily focused on intensity, and if you have an

intense day, keep it intense. Don't pack on the volume. If we have an intense day, it's going to be short. Then you have your extensive stuff. So if we're building capacity, if we're training, let's say, a soccer player or something, a rugby player, we have dedicated days that are more geared towards capacity. And then we have the spectrum, so we have everything from lower level aerobic and maximal aerobic speed, like tempo type, all the way to tempo running, all the way to repeat speed, and on that spectrum. So we think about it as you're not going to adapt to the speed if you add on extensive volume. You have to keep that in its lane. Now, if you do extensive stuff, you kind of want to just leave that in its own category. Allow your body to do that. And I think about if I do speed on a Monday, and I do extensive work on a Tuesday, I'm actually helping recover from some of the nervous system-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... stress that I had on Monday. And again, we're probably talking to Charlie Francis in heaven right now. But yeah.

Dr. Andy Galpin

Yeah.

Les Spellman

We're using that as a circulatory system flush-

Dr. Andy Galpin

Yeah

Les Spellman

... and allowing them to get the extensive work in, which is going to help them prepare for the sport, but also help recover from the intense work that we did.

Dr. Andy Galpin

Yes. You need to be able to hold your speed over fatigue, but we can't get you faster and get you fatigue resistant on the same session.

Les Spellman

Right.

Dr. Andy Galpin

Those are two different things.

Les Spellman

Yeah, two different things, yeah.

Dr. Andy Galpin

I asked a second ago, and I would love to understand a little bit more about this strength side of the equation. Now I'll call it something different, not force.

Les Spellman

Yeah.

Dr. Andy Galpin

Something strength. How do I know if I'm strong enough where I can not have to worry about getting stronger-

Les Spellman

Yeah

Dr. Andy Galpin

... or actually I do?

Les Spellman

Yeah, so we're alluding to probably what we were damaged by in high school and college and all that stuff. Most of us are biased towards doing heavy load, high load stuff in the weight room because that's the culture that America has driven. And it's not the same when I talk to my friends in England and other places. I would say it is an American culture thing. Bigger, faster, stronger, push more weight. And I think what happens is that we overdo that quality, and we underdo the fast force side of things. So moving things fast, doing the jumps, the hops, the bounds, those qualities. So without going into profiling, we do have a profiling system that does like, all right, are you strong enough? Are you whatever? But I would say balancing out your work so that you're doing the high force, high load stuff, but you're also doing the other side of the equation. And if you are doing heavy loads, don't completely ignore the eccentric side of it.

Les Spellman

Because we were taught to, along with the bigger, faster, stronger-

Dr. Andy Galpin

Mm

Les Spellman

... is avoid eccentrics-

Dr. Andy Galpin

Right

Les Spellman

... because you're going to get sore, tired, or hurt, or-

Dr. Andy Galpin

Yeah.

Les Spellman

Yeah. Because you're not good at it, and- ... you haven't done it, so of course you're going to be sore. But I would say that the main thing on that is your average high school kid that goes to LA Fitness wants to get in and throw around the heaviest weight that he can. And if you find the strongest kid on every football team, doesn't necessarily mean you're the best kid. And you have to balance that workout on both sides. So, without getting the profiling side of things, if you just look at the distribution of how kids are lifting weights, it's either heavy, high weight, or bodybuilding.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

And they're saying, "We're going back-

Dr. Andy Galpin

Yeah

Les Spellman

... this day, tris this way, bis this way," and they neglect the thing. So, we talked about this off-camera. Most people don't run fast often enough, right? So, you can't get better at it if you don't do it, and if you look at what do people get better at, they get better at looking like a frat bro, where they're really big up top and no legs, because that's all they do in the weight room. So, I would say the balance of how you train the qualities in my system, it's fast force, which would be moving things fast and reactive, and then you have high force, which would be high load or high speed, and then you have slow force, which is going to be negatives, tempo work, bigger range of motion, things like that. And I think if you look at what everyone's doing, they're just attacking one column, high force, high load.

Dr. Andy Galpin

What I want to ask next is about the injury risk-

Les Spellman

Yeah

Dr. Andy Galpin

... of running full speed.

Les Spellman

Yeah.

Dr. Andy Galpin

So, for the average person, if they haven't run full speed in 15 years-

Les Spellman

Yeah

Dr. Andy Galpin

... should they go out and full throttle peg- ... and do that? And then the second part of that question is, how safe is it for highly trained people to run at-

Les Spellman

Yeah

Dr. Andy Galpin

... full, full speed, or-

Les Spellman

Yeah

Dr. Andy Galpin

... should they avoid it?

Les Spellman

If you have not run full speed in a month, you shouldn't go out and run. So, 15 years, definitely not. So what should you do? So, it's very similar to saying, "I haven't back squatted in 12 years. Should I hit four or five today?" And everyone would be like, "Yeah, no, don't do that. You'd get hurt. Your system isn't ready for it." And this is, not to step on Huberman and Stu's podcast, but Stu's like, "Start with some medium intensity work," so like skipping or things like tempo running, things that could get your system prepared to sprint. Which, again, goes back to the weight room side of things. You could prepare yourself in the weight room. But doing things that are horizontal and starting with acceleration, so training your body to accelerate first and then progressing into higher and higher speeds, it'll take some time. It's very similar to running a marathon. I could probably today run a marathon and I would be hurt because I haven't run over five miles.

Les Spellman

Five miles is the max that I've reached in the past, I would say six months is the max I've reached. So doing 26 miles is a massive increase, and this goes back to acute chronics and all that good work. But the level of intensity I've done chronically doesn't prepare me for what I'm about to do acutely. So should definitely not do it. And just progress yourself. I think you could probably say if I was running 15 to 20 miles and I did 26-

Dr. Andy Galpin

Sure

Les Spellman

... yeah, it's a step up, but the step up is not too big. So I could probably-

Dr. Andy Galpin

Yeah, relative percent increases-

Les Spellman

I could probably do it

Dr. Andy Galpin

... within range.

Les Spellman

Yeah. Now, for highly trained athletes, doing maximal 100% speed is something you have to be careful about. Now, I think there's probably a misunderstanding around, how do I explain this? Around percentages of your max. So the difference between 90% of your max and 92% is a lot bigger than what people realize. It's same as weight room. It's-

Dr. Andy Galpin

I'm at a four.six, I could easily get to a four.three.

Les Spellman

Yeah, it's crazy.

Dr. Andy Galpin

No.

Les Spellman

And then you expand that out. If you're running 95% and then you hit 98%, that jump is not 3%. It's way bigger for your nervous system.

Dr. Andy Galpin

Yeah.

Les Spellman

Right? So I think that athletes need a healthy dosage of about 90 to 95% of their speed weekly. Every week, you need that. Now, the 95 to 100% is not something you need every week. And in fact, if you're trying to get faster and you hit those percentages above 95%, I've found that it takes about two weeks to swing back to get to that point again. So when we have athletes PR, like in training, they PR, and they hit a four.three.five. Well, it takes about two weeks to be able to repeat that four.three.five. Which I learned the hard way-

Dr. Andy Galpin

Mm-hmm

Les Spellman

... because I used to do testing the week before the combine.

Dr. Andy Galpin

Oh, no.

Les Spellman

Yeah. And they would run faster in testing than the combine.

Dr. Andy Galpin

Of course.

Les Spellman

So we moved it to two weeks before, 14 days out, they swing back, and they hit a new speed. So you want to dose those things in as needed. Now, off-season's a time to do it. So in the off-season, I build two-week blocks where I can hit a high speed, do all the things in between, come back two weeks later, hit a high speed, and I'm progressively bringing you up to your new capacity, new high speed in the off-season. Then I pass you off to your team, and you just do the basic minimal effective dosage of 90 to 95% weekly, and you're good. But there's a time to push that- That capacity of who you are up. There's time to tune that engine, and that's the off-season. In-season is more of minimal effective dosages. Now, you can get faster in-season. We proved that with Arizona. We actually got, I think it was 44% of the team faster, 43% or 44% of the team faster in-season compared to what their off-season numbers were, but that was only doing minimal effective dosages and training acceleration.

Dr. Andy Galpin

I'm going to transition to a few kind of subcategories here.

Les Spellman

Yeah.

Dr. Andy Galpin

I have a strong interest in this field from a kid, youth perspective. It's arguably one of the scariest things that you see.

Les Spellman

Mm-hmm.

Dr. Andy Galpin

A kid wants to get fast. We all know speed is what makes a lot of sports, and then you got the speed coach, you got the speed camp.

Les Spellman

Yeah.

Dr. Andy Galpin

Do you have any advice for that parent of what to think about, what to look for, red flags, anything like that where they could think about, "Okay, this person will help. Maybe this person wouldn't," or so on and so forth. How do we think of this?

Les Spellman

Yeah. I would say the main thing is that during those developmental windows, like if you're 12 years old, 12 to 14, that's a highly trainable window that you're going to get a lot out of. Now, what can interrupt that is trying to teach too much technique. So, as I grow and I'm awkward and I'm going through all these changes, I'm going to start to express technique that may not be optimal to what's good from our standards of watching track and field. Good example, you have somebody with high heel recovery, big back swing. Well, they might be in a phase where their tibia is relatively long compared to their femur, and it's going to cause this back swing. So, me yelling at a kid to fix that might interrupt the actual process of them getting better. And number one, it's going to lower the intensity of the session, so they're not going to get the hormonal benefits of running fast. And number two, it's going to make it conscious to the point where I'm trying to fix it, but I can't fix this, and I'm frustrated, and I'm just not good at it.

Les Spellman

And you see what I'm saying?

Dr. Andy Galpin

Yeah.

Les Spellman

So, what I'm seeing in a lot of youth training is over-coaching of the technical things and under exposure to the physical things. So, if you break out the components of what actually makes a kid faster in those developmental windows, the number one thing is going to be exposure. Exposure. The number two thing is going to be those drivers, which you talked about weight room, but it may not look like heavy load. It might be dropping off boxes, jumping up to boxes, stepping down. It might be basic drivers that allow you to express more force when you do those things. And then the last thing, and probably the least important thing, is teaching some coordination. I'm guilty of this, so I don't mind speaking on it. For years, I'm doing drill, drill, drill. Put your foot here, put your arm here, do this. That's the worst way you could teach somebody to run fast, the absolute worst way. And I think it interrupts a lot of the natural processes athletes would experience if they didn't have that teaching.

Dr. Andy Galpin

What age is it okay, roughly, for people to go to a speed camp, to hire a speed coach? When do we bring those things in?

Les Spellman

I would prefer 12 years old, around that developmental window. For girls, it's typically I found 10, so a little bit earlier.

Dr. Andy Galpin

Mm-hmm.

Les Spellman

So, one is maturity level. So, if you have a son that is not interested in sitting there and learning a skill that is adjacent to their sport, meaning speed or agility or strength, whatever, let them just play their sport. It's all good. You're not going to be missing a ton of things. Because the worst thing you could do is have them go into a speed academy and learn a bunch of stuff that they're not really applying, and it's interrupting some of their processes. I'd rather you just go play your sport. Go play outside. Interview Tyreek Hill. Did he have a speed coach?

Dr. Andy Galpin

No.

Les Spellman

I'm pretty sure he didn't. Now, genetically different, but yeah, a lot of those guys didn't have coaching. Guys in the NFL now, because of their age, may have had a speed coach, but the guys that came before them definitely did not have a speed coach. So, I think you could actually do more harm than good starting them too early. For girls, they seem to mentally be more into receiving coaching at a younger age, I've found, like 9, 10 years old, and I've taken girls around that age and developed them throughout. I have a soccer player right now, Katarina Macario, she's probably 10 or 11 when I first got her, and she's been a professional for a while, and she could take the coaching, and she was very serious. But I think most parents start their kids too early, and they forget the play side of it. I'd rather you, at nine years old, go enter a flag football league, in a basketball league, in a track thing, and just try a bunch of different playful things.

Les Spellman

You'll develop significantly faster. You want to find the right window of trainability. And for boys, it's like 12 to 14, during that time period, and really attack it, and the benefits they'll get out of that are going to carry throughout your life and your career. Now, it does get complicated as you grow and get older. It gets more and more complicated not because speed is hard, but because the competing demands around speed are harder. So, you have to have a professional that can understand, okay, you just had a really hard game. What to do next? Now, that's where the skill

of coaching comes into play. It's not necessarily put your foot here, do this. It's more managing all the other components around that athlete's life that dictate how they express speed in game. That's the hard part, and that's why you need a professional at some point.

Dr. Andy Galpin

Of any of the things we've covered the last couple of hours-

Les Spellman

Mm

Dr. Andy Galpin

...

Dr. Andy Galpin

is there any differences in training speed between men and women?

Les Spellman

Okay. This is something I just found out. I told you in the car, we've done 1.2 million tests on speed, and that's across age groups from nine to 65. But the majority of those are 12 to 18. The interesting thing is that girls and boys were about the same speed until 12. About the same speed. Well, what happens at 12? You start-

Dr. Andy Galpin

Yeah

Les Spellman

... to get a little bit more testosterone and things change. So as their force capabilities increase around 12, you see a separation, and the girls flatline a little bit until about 14, and then you see a big jump at 14. So it's interesting. So what I've found in training them is, okay, the girls that we're working with up till 12 will pretty much do the same things. What we've found around 12 with the girls is we need to really start exposing them to higher speed, getting them running, getting them racing. No teaching, just let them run. And, with the boys, it's going to be we're influencing a little bit of the same stuff, but now they're starting to produce more forces, do things, so we need to support that capability. The other thing that you notice around developing athletes is that boys will accidentally walk into a weight room and do stuff. They'll pick up a weight and they'll do this.

Dr. Andy Galpin

Yeah.

Les Spellman

Well, girls don't do that. Some do, so don't get me wrong.

Dr. Andy Galpin

Right. I got you.

Les Spellman

But it's not ingrained into our culture that the girl is like, "Hey, Mom, can I go to LA Fitness with my girls?" Doesn't really happen. So if you think about the things that you should be doing with that population is developing them from a strength perspective, and also just the anatomical differences, which I'm not an expert on, so I'm not going to speak on it. But the anatomical differences in females, there's things that you have to build to allow them to express the speed later on. So because of culture and society, we're going to have the girls do performance stuff that involves weight room, strength, all those things. Again, we're not back squatting 12-year-olds, but are we doing step-ups with the med ball? Are we doing med ball throws? Are we doing general preparation things? Yes, 1,000%. Whereas the boys are counter-naturally you're just going to increase their testosterone and get stronger as we go.

Les Spellman

We're still doing that with them, but the girls, that was a massive revelation of why they dropped off at 12 and then regained at 14.

Dr. Andy Galpin

What about as adults?

Les Spellman

In terms of sprinting?

Dr. Andy Galpin

In terms of-

Les Spellman

Of-

Dr. Andy Galpin

... any speed, sprint, change of direction, any of that stuff. Are your 23-year-old professional females doing significantly different training than your 23-year-old professional men?

Les Spellman

Not a ton at the professional level. The only difference is that none of my professional females play football.

Dr. Andy Galpin

Tackle football.

Les Spellman

So yeah, they play soccer. And-

Dr. Andy Galpin

So it's sport-specific rather than it is-

Les Spellman

Yeah

Dr. Andy Galpin

... sex-

Les Spellman

Ends up being-

Dr. Andy Galpin

Specific

Les Spellman

... sport-specific.

Dr. Andy Galpin

There are a ton of athletes that want to be faster for the most part. There's also a lot of adults who are not athletes that want to get faster. I can't tell you how many people that run marathons, half-marathons, cycle, swim, or like, "I'm trying to get faster"-

Les Spellman

Yeah

Dr. Andy Galpin

... and those things. What advice would you give those, so this is an adult, this is a potentially 40, 50, 60 years old, and they want to run their race faster.

Les Spellman

Yeah.

Dr. Andy Galpin

How could they incorporate all the amazing stuff you've shared as maybe just a couple of starting tips and points?

Les Spellman

Yeah. So I would primarily start with training acceleration, and because, number one, acceleration is lower speed, so it's lower intensity. Number two, you can do more of it. And number three, it's a smaller gap between what you're currently doing and high-speed running.

High-speed running is-

Dr. Andy Galpin

Ah

Les Spellman

... very difficult if you haven't done it, even from just a coordination standpoint. So then you look at what are the limiting factors in acceleration. Well, most adults lose their ability to extend their hip, and extend their hip far, extend their hip fast, and with force. So if you look at old supple leopard-type stuff with Kelly Starrett-

Dr. Andy Galpin

Yeah

Les Spellman

... he was always talking about do your banded hip distractions. You guys sit all day. Well, it comes from us sitting at desks and doing this all day. We lose our ability to extend our hip, which is a primary driver of propulsion. So if you are, let's say, a marathoner, not crazy competitive, but you like to marathon, do 5Ks, all that stuff, if you improve your ability to extend your hip and you improve how fast you can do it and how much force you can do that with, you will run faster. So you take the skill of accelerating and push it into, I'm going to work on extending my hip further, faster, and with more force. And that's something you could train both in the weight room, so you could do split squats versus only bilateral squats. So you can add some hip extension. You could do it pre-training, so you could do mobility like supple leopard, hip extension-

Dr. Andy Galpin

Mm

Les Spellman

... band distraction-type stuff. And then you could do it in your warmup where you force yourself to accelerate and extend the hip fast. Now, all three of those ways are training not only a skill, but a capacity to extend the hip fast that's going to transfer over to your running. So I would start there, and then I would progressively add in higher speed work, but not in the form of maximal speed work. So what's the step down from maximal speed? It would be tempo work. So teaching your system to accept higher forces progressively by doing tempo work, which is going to be, in tempo work, it's implying that you're doing a higher density of it, so it's not full rest periods. It's submaximal because you're doing it often. You run a rep of 100-yard tempo run and you rest for 30 seconds. Well, by nature, you can't run your full speed because you're not getting a full recovery. So start there, so you're building a capacity, and then progressively just start to bleed in faster and faster efforts until the point where you can warm up and hit a high-speed sprint before you go run.

Les Spellman

Now, again, you caught me running today, and I run, let's say, 15 miles a week. So I'm going to do a marathon in a year as a challenge for no reason other than it was a challenge. So I'm running progressively to get faster. Well, I'm also a speed coach, and all my guys want to race, and I don't want to lose. So what I do is I warm up and I hit a high-speed sprint. I run as fast as I can, and then I go for my run. It's like you could start to bleed in in your warmup. And I'll tell you this, to be honest, I found that's been a superpower for me, knowing about speed, where I do that before I go run distance I'm all the way awake and warm. It's like drinking five shots of espresso and then going for a run. You're going to be awake. So I've tapped into that, and I'm like, "I don't know why more people don't do this."

Dr. Andy Galpin

Yeah. So you get nice and warmed up, you touch that 24, 25 miles an hour-

Les Spellman

Oh, God

Dr. Andy Galpin

... and then you-

Les Spellman

Twenty-four

Dr. Andy Galpin

... go for your jog.

Les Spellman

In a car, maybe.

Dr. Andy Galpin

This has been so informative. I told you at the beginning, man, I love this topic. I've loved all the stuff you've done for years. Thank you for answering all these questions and-

Les Spellman

Of course

Dr. Andy Galpin

... and then doing all this. I do have one final thing.

Les Spellman

Yeah.

Dr. Andy Galpin

I've watched your career from, "Who the hell is this guy?"

Les Spellman

Yeah.

Dr. Andy Galpin

To, "This is the most elite guy in the field." The most in-demand speed guy we've seen in there.

Les Spellman

I appreciate it.

Dr. Andy Galpin

Everybody wants to be you. Everybody wants to have the names on the resume there.

Dr. Andy Galpin

Any little advice for the up-and-comers, the kids who're going, "How did you get from that to having all these people on the roster?"

Les Spellman

I would say the first thing is I care a lot about what's in front of me, always. So I never really wrote out goals, which is weird because it's like, "Wait, what? You didn't write goals?" I didn't write goals at all when it came to long-term stuff. It was always short-term, like, "I want to train this many athletes right now or do this thing." But I was so hyper-focused in the moment about who was in front of me, regardless of who was in front of me. Seven-year-old one-on-one session, it didn't matter. I'm going all in. It's probably my limiting factor in some ways, but it's a superpower in others. I don't look too far forward. I just look what's in front, and I want to kill it. So I was training seven-year-olds in a park, and then I was training moms in the morning to afford to even go to an Altus event and these things, and investing so much in education that I could barely afford to pay my rent.

Les Spellman

But it was all because I cared so much about the little details, and what I see now, and I don't want to sound like the older guy that's-- I'm 37, but it's going to sound like that, so I don't care. People are entering the industry for reasons that aren't caring, which means they're entering, "Oh, I want to make some money. Oh, I want to train professionals." I never once said I want to train pros. I was just like, "I love coaching," and I love coaching because it was the next closest thing to playing for me at the time. And I love being around sports, and I like people. So I didn't want to get a desk job, so I'm just going to do this thing, and I'm going to read these books, and I'm hoping this works. And my mom would always say, "Man, are you going to get a job?" And I was like, "This is my job." And she's like, "What are you, a gym teacher?" I'm like, "Yeah, pretty much." And to see not only the industry grow, but me grow as a result was huge, where I transformed my life just from caring more about people and never thought about the byproducts of what was happening.

Les Spellman

So I'm not really able to even perceive what's happening in the next five years on this track. It's just all a surprise to me because I'm just so, like, what's right here?

Dr. Andy Galpin

Well, I can tell you what's going to happen the next five years. You're going to continue to accelerate and grow. I've watched the field of speed training evolve over 25 years that I've been paying attention to it.

Les Spellman

Mm-hmm.

Dr. Andy Galpin

I've watched it move in large part recently because of the stuff you're doing and putting out there-

Les Spellman

Thank you

Dr. Andy Galpin

... and the education, which I'm grateful for. I'm grateful for you coming today. I know you've got three little sick kids at home.

Les Spellman

It's all good. They're good. They're on their way to San Diego. They're good.

Dr. Andy Galpin

Okay. Well-

Les Spellman

Thank you

Dr. Andy Galpin

... I am that, and for honoring my neuroses with this topic and poor lengthy questions and such. So grateful for you. I hope you continue to educate the field, and it's been a pleasure. Thank you so much.

Les Spellman

Thank you, man. This is awesome. I appreciate it. Appreciate you guys, too. Thank you.

Dr. Andy Galpin

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

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Dr. Andy Galpin

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