DANNY LENNON: Andy, welcome to the podcast. Thank you so much for joining me today man.

ANDY GALPIN: It's a pleasure to be here man. I'm excited to talk to you.

DANNY LENNON: I'm extremely excited and I have been looking to do this for quite a period of time after. I've been aware of your work for a considerable period of time but even more so over, I suppose the last year, you have been quite prevalent on a number of other different forms of media. On some pretty big podcasts that people live be familiar with listen to you on Joe Rogan. I know you've been on Mark Bells and a few others. But particularly with the Rogan interview, it was from my part, one of my favorite things to see because whilst being an MMA fan, I tend to like a lot of discussions on that particular podcast but sometimes when the topic of nutrition especially is brought up, you can have your head banging against the wall sometimes. And so some of the context and nuance I think are two big topics on this particular podcast can get lost so it was extremely refreshing to see you bring an element of that. I'm going to circle back to that later on and maybe talk about communication and science in more depth. But that's really, when I listen to that, I really had to get you on to talk about some of those issues. Before we get into any of that, just give people who are maybe unaware of your

work a brief background, what are kind of the cliff notes they should know about you and the work you currently do?

ANDY GALPIN: Well, I've got a PhD in Human Bioenergetics and I run a... I'm the director for the Center for Sport Performance at Fullerton. And then I also founded and directed my lab, which is about chemistry and molecular muscle physiology. So I do a lot of research. We specialize in the muscle biopsy. We study athletes, so, we take muscle samples of athletes and look at different training and nutrition questions.

But we don't do it from the perspective of disease treatment prevention and management, we do it from a performance based staff so, in addition to that I teach and I work a decent amount with real athletes on mostly on nutrition-related things so I work with Olympians, combat sport athletes, boxers, wrestlers, MMA fighters, UFC fighters, things like that so. I'm a little bit scientist, a little bit teacher and a little bit practitioner. So, that's kind of what I do.

DANNY LENNON: Yeah and I think that last line that you mentioned is a really valuable description in that it kind of part scientist, part practitioner and I think largely kind of part education and I've seen you have a really important role in as far as bridging the gap between the science and the kind of practitioner spectrum as well. I think one of the things you've done particularly well for what I'm seeing is being able to have that ability to communicate what science really is and scientific concepts. Not just being able to explain them but to get people aware of what essentially science and research shows us.

And it seems to me from the outside that a lot of thought has gone in on your behalf of how to communicate that depending on who is going to be listening and maybe what they already know so, how does that for you or where does that start of... because it seems it's quite a passionary view of being able to explain to people how to think about scientific concepts as opposed to you just being this guy who dolls out facts if that kind of rings true.

ANDY GALPIN: Man I wish I could give you a great answer for that but I don't know. The only thing I can say is, I guess the best

explanation is, you know, despite all my academic accolades and publications and awards and things like that, I'm really not that smart of a person from the classic metrics of smart. I did not do well in GPA in high school. Not because I didn't try, but because I just don't have a lot of horse power upstairs for things like that. And so, I guess the reason I stress being able to communicate things effectively to people is because it would have helped me. And it takes me a long time to wrap things in and I'm a story teller by nature, and I'm a story, you know, advocate, a junkie.

And so for me, until something put in a very clear story, I don't really understand the connection, so that is just how my brain works and I have a hard time kind of wrapping my head around things until I see how everything connects directly. So, that's just the way I go about teaching that to people because I know, I'm pretty good. I have an above average talent of hearing something and going, I think not everybody would get that because they're not going to see this part of it. And so then I can go back and sort of fill in the gap and then everyone go, "Oh. I get it now." And so it's part natural talent I guess.

Not to be super arrogant but it's also, it's a long practice. I've been trying to get better at those things for a very, very long time. And every aspect in my teaching. One of the presentations to clinics. I spend an exorbitant amount of time on those things to try to make sure that you can follow the logic all the way through, and there's no holes and no gaps. So I did it mostly because things didn't make sense to me. And I remember in classes hearing things and going like, "Okay, I get that. I believe you, but I'm just not seeing how this would fully be this," or whatever, and then spending weeks or years trying to figure out that missing gap and then going "Oh great. Now I see the circle.

I bet everyone else if they saw this in this format or this series would get a lot better." So I think that's probably why I do it because I'm not that smart. So it's helpful for me to understand things.

DANNY LENNON: Seems that there's this kind of underlying theme or at least a commonality amongst much of the ideas that get discussed and particularly why I was drawn to the way you explain them to people. Is that you see this commonality of essentially a way to think about these topics, right. And getting people to actually critically appraise the kind of buzz words that they're hearing, and then being able to weigh up kind of two different sides of this and seeing that maybe there's pros and cons to different things, but there's also a bit of context we have to take with that.

Do you think from your perspective when you're giving out this information and you're communicating with, let's say more the general public on some of these topics that there's that kind of idea of trying to give them that... Those tools to be able to think through and interpret these things beyond the specific concept you're talking about that time. Because at least from where I'm standing, it kind of seems that for regardless whether you're talking about protein feeding or muscle physiology or muscle fiber type, there is the same kind of thought process that you're trying to get across the people of how to think through those types of things, if that makes sense.

ANDY GALPIN: Yeah. That's probably because of a couple of things. Number one, again, this is how my brain works, where I like to try not to steal information and figure out the singular truth that's connecting as many pieces of seemingly unconnected information as possible. And I think when you do that, we can teach processes and not individual data sets, because what actually happens is if you spend a tremendous amount of time memorizing or studying really hard on a specific data set, what happens when that data is now found to be erroneous. Like, shit, I just wasted time.

So I try to say, well, let's look at the commonality or the scaffolding behind things. And then that way when you lose a piece of frame, that's okay, the whole house doesn't collapse. And I think that the part of it is, keep in mind, men, I'm a scientist, I guess, but I still don't really see myself as a scientist. I really see myself as a practitioner first in a lot of ways. So whenever I see science, I'm still looking at it from

the lens of going; “okay, I see that but that wouldn't work in this athlete”. Or... “Now there's a difference between going from very low back to normal, and that's not the same as going from normal to very high.”

And I can see that because I'm always looking at it from the practitioners perspective and going if I was a coach, or if I was of somebody on the ground troops, would that really matter for me or is that really true and so I try to look at things as uniquely as possible. And any other sort of side that is I've made a lot of these mistakes earlier my career and just being so arrogant and being so one sided and so biased. And that continually shown up to be like, well, no, actually that's wrong. And I just had a realization, whatever. It was five or ten or eight years ago, or something, that was like, man, you're being super self-centered here and you're not considering other people's perspective.

So when you look at that data set and then you're making a angry post about how this will never work, and this is stupid, or this guy's an idiot, or whatever it is, you're not really considering it from the perspective that they are trying to communicate because maybe something like you're considering from a perspective of an elite level weight lifter, but they're writing that poster, they're saying do this exercise because they work with clinical populations coming back from knee injury and since like, well, of course, that wouldn't apply to my population. But it was my fault for not understanding the context in which they were describing it. It was my arrogance.

And so that's the message I try to get to people. Just saying, look, there can be multiple truths we can look at. I can give you examples if you want some specific cases of science. And once I started doing that, I really honestly try to look at individual data sets, not as truth, but as simply information. And there's a real problem with that, because science doesn't give us answers in a lot of the case, it just reduces uncertainty. And what we can do with that is we look at and go, okay. We have this thing called a fallacy of black and white, where we tend to have this problem with

understanding mutual exclusivity. And it's things like, well, if this worked, then it worked.

That's not how science works. And anyone that knows anything about science is like, no that just simply means this is what happened. And you've got a really circle around that data, an entire, as big of a 360 loop as you possibly can to really understand what's going on and then you can go, okay. And it comes down to like a basic philosophical question. So I'll pose this to you right now. I use this in my first day of class in my nutrition classes. So I remember seeing Joey Antonio. You guys... Everyone probably knows Joey. He's fantastic. But 15 years ago or something at a conference and saying look, my philosophy on supplements is if it has a neutral to potentially positive effect then why not take it. Okay.

Well some people have a philosophy of well, I'm not going to take any supplement unless it has an extremely high-level benefit with no risk. Well, so then a paper could come out and Joey could look at it and it would go okay, this new supplement. No risk, doesn't seem to be hurting anybody and has, you know, in 60% of the athletes tested, it improved endurance 3%. Okay so that's the data. Those are what the data are. So it's not that Joey is arguing with other people on the internet about who's right or who's wrong it's simply his philosophy about how he chooses to implement that because the data are what the data are and he looks at that and goes, fantastic I'm going to use it. Why? Because there's no potential harm and it's potential for a small benefit.

Where another person may look at that and go the exact same piece of data and go, no. It doesn't really exceed expectations. There's no real need to do it. Low likelihood of success. I'm going to opt out. And once I started realizing things like that was like, "Oh. This is not about the data. This is about your philosophy and how can I argue Danny and go, now your philosophy as wrong. Like we can argue about the data all we want that's fine. That's what science should be about but how do you interpret it.

What you do with the data is your personal approach and that's what we really have to consider and so much of bickering back and forth about whether or not something "works" is not people actually understanding the data, it's their approach or their philosophy of how they want to implement supplements or nutrition or things like that so that's what we really have to understand and once you can get that perspective from people you can go, oh. Actually they're not fighting. It's not that confusing. This person just likes to do A and this person likes to do B. Okay fine.

DANNY LENNON: There's a number of gems that come up there that I'm going to circle back to. The first is I think it's is really valuable that you mentioned there that a lot of the time we see debates between different topics when really what people are... It's like the two people in that argument are arguing its position. The other person actually really doesn't hold. And like you say some of that can come down to people interpreting things in different ways. But a lot of time then can be... Someone's arguing for whether something works or not and really a lot of time that's not what we are trying to work out with science.

So, for example, if we talk about low-carb diets, right. Do they work or not? Of course they work because people have done them. The more interesting question is why are they working? And one of the principles behind why this diet works as opposed to does something work. And I think people kind of miss what people are trying to say when they say for example, there may be no inherent benefit to changing say carbohydrate intake if we control for protein calories. But then people say, "Well I've tried to low-carb diet and it worked for me great so you're obviously you're talking nonsense." And they're just arguing against a different point.

ANDY GALPIN: But no, your point is really really good. That's exactly the type of thing I'm talking about where, you know like, does it work is the worst question ever in the history of nutrition. Like it all works. Everything works. If you think that you could put something in your body especially that comes in hyper...in dosages that are that are above and beyond normality. So things that are in concentrations that you

would never find in nature if you will in human nature. It's definitely going to work but it really comes down to what do you mean by work?

Like that's in a very very long conversation right, so can it work? Yes. Is it actually better than the status quo? Well that's a different question too. And what do you define by work? And those are the really good questions and conversations because does it work? Yeah. Well everything does. So there's a thousand ways to get there. Those are just really bad questions

DANNY LENNON: Yeah. Sure and I think the second thing that you had mentioned that actually reminded me of something recently that Mike Zourdos said to me. Talking again about research and what we can take from it and trying to think of how that applies to the practitioner is that this understanding of a particular study is going to be conceptual. So it's going to show us some sort of concept that in this particular scenario in that we were looking for these specific variables in this study and it may hint towards a concept that may work.

And then we can go and try and place that into practice as opposed to saying, "Okay. Here's the training intervention they used in this study. So they saw a benefit, so this is what I must use with everyone." That's not what research is or supposed to be and it kind of reminded me of the point that you made there Andy. So I think there are really valuable things for people to bear in mind. One thing I did want to ask also on that is... sorry did I jump in there?

ANDY GALPIN: It's just because it's funny because, you know, I've done a lot of publicity. I get impressed from saying things like that but as you know man like that is research methods like day one stuff. That's the first thing you're taught even as an undergrad about. This is, hey, you know, like there's those dependent variables, independent variables. Okay, statistics oh yeah, by the way public population like this is very basic stuff. You don't have to have a PhD and run a senator performance and get awards and get fellowships to do things like that.

It's the very basics of what research can do and science can do and it's honestly something I remember Carl Sagan teaching the world in 1980. Like I watched this on TV when I was 10. Like this is nothing new or revolutionary here.

DANNY LENNON: Yeah. One thing I wanted to ask and obviously with the level of athletes you have worked with and continued to work with and people are working in an elite level on the kind of practitioner side but then on the kind of other side of the coin, you're obviously deeply embedded within research and academia and well-known for kind of understanding of the evidence base and so on. How do we consolidate those two things that may be kind of conflicting in that. If we want to try and be obviously evidence-based in our approach and have a vast understanding of what the literature is saying.

But then when it comes to you are working with an individual elite athlete. Just in on one side their physiology could just be completely crazy compared to a normal person. It's just it's like you're comparing two different species almost at times. And then the other side of when we look at actual research. What constitutes being a trained person or someone that has at a certain level of say training history or an athlete in research is very different to the elite of the elite that you have been working with. So how do you try and consolidate that kind of limitation in terms of what we actually can see from research but also at the same time training. Trying to make most of your methods evidence-based?

ANDY GALPIN: Well, I think the step number one is extreme humility. When you start working with an athlete, and you've got a, say a PhD. Maybe you've got a PhD in nutrition and you're an RD as well and you're an MD. Maybe you got three. You're an MD, PhD, RD. And you've actually never worked with a real human being. You have to understand, you don't know shit. Like you have no idea what you're doing. And that's the flattest, most honest truth I can give you is, you don’t have any idea what all these theories and concepts you could say it’s science, not theory because they run a randomized chemical trial, bullshit that is still theory. Because that just

tells you what's the average going to happen, what's most likely to happen.

If you look at any study, there are error bars for a reason, right. There are standard deviations for a reason. That means like very directly, some people responded differently and when you're talking about science, you're talking about averages of groups. But when you're talking about working with athletes, you're talking about that person and that person really gives a huge fuck if they are the norm or they are not the norm. Like that really, really matters. That's everything, so I have done a thousand things with clients and athletes that are directly "the science" because we tried the science first and it didn't work.

So like or it was only working kind of well and we're like well let's try the other way. Oh my God that's worked way better. Maybe you don't even know why. The other thing is science this has this very classic dilemma between internal and external validity, right. Now most your listeners are pretty educated, they should know what that means but as you maximize internal validity and you can really say for sure this is what exactly what caused the change, you minimize external validity. Well unfortunately, when you work with an athlete, you are maximizing external validity. And so all of those controls go out the window.

You're not standing guising it. They're not fasting when they come in. They don't have to sleep controlled. Things are chaotic and they're hectic and they're completely changing and you did this and they were supposed to do this and then this happened and then something else went wrong and this did this. You know like so it's you have to understand that science is not infallible and go to work with athletes. You can kind of start there, but then you also have to realize, all right well I have to really pay attention to what's actually happening in this individual person.

It may or may not be what needs to happen so that's the best way... is you have to approach it with extreme humility realizing that science is just going give me a starting place and it's not the actual individual answer though because, you

know, once we come, especially if you look at things like a meta-analysis, you know, that's a combination of enough tons, if not that it's an average of thousands of people now. But that means there are people up and down that spectrum out and all over the place and so that actually has the least amount of external validity possible or a direct application because you don't know where you're going to be.

Having an average helps for sure but, you know, especially when it's like for me I work with Olympians, and gold medalists and world champions and, like you said, kind of answer the question, their physiology almost by nature is probably a little bit different and so unless there's been a study that's manipulated that variable directly in world champions when there's six weeks out from the Olympics. I don't know how it's going to happen. Endless studies haven't been done FYI, so I don't know that that's exactly going to work.

It's just like we hope and all the sudden training volume goes way up and they get sick and then they get nervous so they're super stressed they stop sleeping and you're just like well. Now you just have to go on the other parts of evidence-base which are what are experts saying? What are practitioners saying? What are your years of experience and your hundreds of athletes you've done this with and so what I do and I guess this is finally going to answer your question. I do not hesitate to reach out to people constantly. I reach out to practitioners.

I reach out to people who don't even have degrees in the field but they've been practicing nutrition successfully for 20 years and I'll ask anybody their thoughts and opinions on something because, I mean I was just talking to uh I'm sure you're familiar with Mike Dolce. I met him literally last night and he was like, “You know I don't have any degrees and PhDs,” and I’m like, “Dude. You don’t have that stuff but what you do have is you have been in that room with hundreds if not thousands of athletes and so you have a whole level of experience that I don't have even have close to.”

So I'm not saying like I follow everything Mike Dolce does but I will listen and maybe I'll disagree on things maybe I won't, but I'm at least going to give that dude my complete attention because I'm like well you have done this a ton of times and you have had a lot of success so there is some merit there. So we at least have to take the veil off like, “Well, I have a PhD therefore, I know more than this guy.” Well you've never actually done it once. You don't know more than that guy does.

DANNY LENNON: Right. Yeah. That's such an important component of evidence-based practice of having... Of been essentially it being able to layer that understanding of the evidence base on top of that personal expertise that you mentioned and working through with say a particular individual over time but also what you've done with other people in a similar scenario and I think it's really important of that clear distinction of what we may do with one specific individual. Maybe wildly different from well even we would classify as, in general the best way to go with a particular type of person may be X.

So if we're talking to a large group of people, we may have some like set recommendations that are pretty a good starting point for nearly all those people but for any given one person, we may do something that people might say oh that's complete that's not just evidence-based, right? There's stuff to counter that and I think people need to be aware of what your general framework is versus in a specific scenario what you might do with one person and you highlight that perfectly Andy. Before we...

ANDY GALPIN: Well, you know, like I did this, sorry... I did this a bunch of times and I was younger and you know you go on people's blog or this is before social media but you go on their website and a magazine and you know when they posted up somebody's diet or somebody's workout routine. And you go on there and you're like, “Oh. This guy's so stupid. Why would you ever do single leg split squats,” or blah blah blah blah with a professional athlete or whatever you know. And then it's like oh once I started writing actual programs for people and started actually putting together diets I'm like,

"Ooh. If you looked at every diet prescription I've ever given some people, you would look at some of them and be like, 'why is he doing this.

Oh my God this is not the evidence-based'" Because I'm like, "Well yeah. That's not what I normally do." But A, B, C and D happen and F happen and in this foot. So I had to step back, take a step back now and exactly what they're mentioning being like, "Oh yeah. Okay." Maybe we should just judge people by seeing one thing they ever posted with one particular athlete because a good coach probably is tailoring their programs specifically to that athlete and it's probably changing constantly based on what's happening, what's progressing, what other factors are going on.

So sometimes you end up doing a few things that are a little bit again "outside the scientific base" because quite simply the scientific base does not exist for that exact situation and so they have to use their best judgment.

DANNY LENNON: Yeah. I completely agree. And just to shift gears because I am keen to talk about a couple of other things I'm interested hear your thoughts on Andy. One of those being the use of or the potential use of technology with athletes because I know this is obviously at least one part of the book that you recently have put out along with Brian Mackenzie. Before giving some specific questions just for maybe people who are unfamiliar, can you mention that book and maybe just like the general thesis or the idea that you're kind of trying to convey through that.

ANDY GALPIN: Yeah. So the basic concept is the fact that we see people using training technologies whether this is heart rate monitors or HRV's to gym wears or whatever technologies in their fitness and Brian and I specifically felt like people are misapplying these things and I mean honestly it's the exact same conversation we just had for the most part where it's people are getting way too lost in the data if you will and they're not really thinking. This is why in the subtitle we specifically use the word consciousness and we're not talking about a metaphysical or spiritual thing, I'm talking about like are you simply aware of what the hell is happening.

Do you realize what these technologies are doing and then if you do and you're making a conscious choice to implement A or B that's totally fine. But a lot of people don't even realize they're automatically implementing A and like oh my gosh that can be a problem and so maybe one of the examples I can give you is if you look at an athlete training with say HRV. A Heart Rate Variability, most people have heard of it. So there's some science behind it and my friend John Cronin in New Zealand has used it for decades, probably years if not, with the New Zealand Olympic athletes and I know other people that have used it with success so there's a little bit of practitioner evidence there.

There's some science evidence. There's a lot of problems with it but okay, fine. So here's a piece of training technology. Now you have to realize, say one day you wake up and you have an HRV score that's really bad and it says, okay Danny take a day off. Well that technology has absolutely no context to what else is going on with the rest of your life. So good example maybe you're in a training phase where you're in the offseason and you're trying to induce massive adaptation. Because the more stress we put on the system the more adapts. But if we don't match that stress with recovery, we can get an overtraining or injury, right?

And so the HRV doesn't understand that. It doesn't understand whether you're in a peaking or a tapering phase or you're an overtraining phase or overreaching phase, I should say. It doesn't have any idea what the training program looks like, it doesn't have an idea what yesterday look like or tomorrow looks like and so you might wake up and the HRV says, hey man take a day off and then you take a day off. Well you actually reduced the stress. You're trying to overreach that's the freaking point and so if you're just... technology said take a day off, I take it off any day, any time I'm a little tired, I take a day off or reduce my workload.

Well that's not the point. And Cal Dietz, the strength coach in Minnesota, I mean his example is so perfect. Because he's like if I'm going to... If I want a three-week overreaching phase and they wake up their HRV says they're tanked, good. Perfect. Go again. Do another rep. Like this is the damn

point and so if you're not though, if you're in a peaking phase or if you're pre-season or in season then maybe that exact same data is met with a different response. And so we just want you again be conscious about okay the data isn't telling you what to do, the data just like we said earlier man.

Like the data are with the data are. You have to be conscious and think about, okay well what do I... how am I going to implement that or what am I going to do about that. If you let that stupid technology tell you what to do, I promise you that technology is not very smart. They can call it smart watches and smart phones all I want but it's not very smart. They are good technologies but they are terrible training tools. So we're not against these things. I'm not against HRV, we're simply saying you as the practitioner, you as the athlete, you are the coach have to out think those damn things because it doesn't understand anything else.

So that's kind of the overarching point of the book is to understand that we have make sure they have a better relationship with these technologies as we're moving athletes forward through their training.

DANNY LENNON: Yeah. I think the HRV is obviously a great example and it's probably something we could have spent a whole podcast talking about and I know particularly get into some of the applications and see some of the limitations that and where it may be used. But it is a particularly useful example and I think alongside that when you mention the for that adaptive response and we're talking of placing a stress on the body and so in all this, in some cases we want that stress there but even when we're looking at stress in terms of trying to manage that.

To prevent this chronic stress that may be caused an issue or lead to injury, I've only talking recently with my friends Palma Carol who's a physiotherapist and actually a medical doctor and one of the things he always highlights when he's talking about was people trying to get a measure of say, stress or even trying to them predict pain with it is that what we're seeing at least so far is and you can correct me if I'm wrong in this, Andy is that any of these objective markers are

still to a large degree kind of paling in significance towards more of the subjective markers that we may use with people.

ANDY GALPIN: Absolutely.

DANNY LENNON: How they're feeling and how they're rating things and these are even much more likely to be able to predict future injury and an illness risk and so even if someone does want to use something objective then maybe the implication is you want to maybe be pairing that with more subjective markers to give you an indication if that's actually correct.

ANDY GALPIN: Yeah. I could not agree more. I mean just basic things like mood, you know, how do you feel? Do you feel like training today? RPE. Some people use how you... you nailed it man. They are... It's not overwhelming, it's not every single study but there's enough data that suggests sometimes these are better, sometimes they're not and I think the great solution is collect them both. And then think about things in context and the other major fallacy that people don't think about is, why do you think that you can't change your HRV?

So you wake up in the morning HRV's in the tanks. What makes you think it's automatically in the tank all day? Why do you think that you can't get up, take a cold shower and all the sudden the HRV changes because guess what, it does. And almost every time, a cold shower for example will kick your HRV right back into green or maybe massage or foam rolling or going for a light walk or playing music you like. All these things can actually acutely change your HRV scores. So again that's what I mean by thinking it's like don't just outsource your intelligence.

This stupid little thing that gives you one number instead of being like, oh. Okay, well, you know and I have had this... I just had one of my UFC fighters fight last week and he used, I won't name the company, but he used a particular watch thing that collected all this data through his whole camp and they sponsored him and, you know, gave money for it and stuff and him. I said, "Sure. Yeah. We'll definitely look at the data and no doubt about it." And we looked through it and it was just crazy. The days that he'd call me and be like man I feel horrendous. I'm shocked today, as HRV would be great.

And I'm like an advice first, he'd be like, "Well the HRV says I'm terrible but like I really want to... I feel like sparring today hard.

I feel good I'm really excited to go spar." And I'm like "Go spar." So like it's number one this thing wasn't very spot on. It wasn't really reflective and there were some days when he'd wake up feeling terrible and his HRV was indeed terrible. But outside of that, I'm like man this thing is just guessing. But for the most part so like, yeah we'll collect it but it didn't end up telling us much.

The couple days he got hurt it didn't, those were not the days he was in the bad zone so it's just like, you know okay, there may be something there to it I guess but it's not the answer and if you think that some retail $200 watch that really cost his company 16 dollars to put together is going to be the answer to all your training problems and also it has this magical insight in your physiology, like come on. You know, I understand the fascination of searching for the magic answer but we got to realize, how many times do we have to continue to get fooled as a species?

It's not there. There's not one method. The same thing with diet. Oh no, it's this. Oh no no no, now it's this. We found it. This is the problem to all... Like how many times do we have to get fooled? You realize like that doesn't exist, it never ever will.

DANNY LENNON: Yeah. It's so super interesting in that it kind of always kind of circles back to a few kind of key principles and similar to the HRV thing, I think a lot can be said for when people are say, even tracking asleep, which could be super valuable and I've had people do it but I think it's more so that... to a similar degree that if this subjective marker or this objective marker of looking at particular data points of sleep times and slow-wave sleep and so on is telling you one thing but you are waking up and feeling terrible every day and you just feel fatigue versus you do something and you're feeling great and refreshed every morning.

That might be more valuable than a specific number of minutes you are in a certain sleep cycle for example. But at

least one thing I'd be interested ask you Andy is, where... I see maybe some of the potential for this stuff is even in cases where it's not entirely accurate for example with something like a sleep monitor or something tracking our movement and people say well it's not really that accurate. And sure I think that's the case and a lot of these devices but if we were to say the potential upside then is even in cases where it's inaccurate there can be some value purely as an awareness tool so get someone to focus on their sleep or focus on their movement.

I'm just wondering off the back of that then do you have a typical decision-making process that you advise to athletes or anyone in general for how to decide on whether a specific technological tool is of use to them is worth looking at, is worth using or not. Is there a kind of a mind about that they can go through or a decision making and a process that will be able to filter decisions on that?

ANDY GALPIN: Yeah. So that's a really good question. In the end of the book a guy named Tim Ferriss, a lot of people have heard of. So Tim got a hold kind of the book and loved it and wanted to contribute so at the end he wrote basically his top ten ways to do exactly what you mentioned and just for the sake of time I'm not going to go through all of them but basically it turns out the scientific method, the process that you were taught when you were in seventh grade or whatever is the exact answer here. So it starts off with something like you've identified a very specific question. Right? So in other words you found a problem.

Something's happening, something's going wrong or you think something might be going wrong you're concerned of something. You found some question. Okay, that’s step one. Step two is generate a hypothesis. Step three is test that hypothesis. Move forward. So what this looks like in terms of your specific question is for whatever reason your training programs don’t work. All right. That's your problem and you want to figure out why is it. You use your coaching experience, you talk to the athletes, you talk to the coaching staff, why is it we're not winning?

Well we think it's because we're over trained. So we're getting tired at the end of the season. Okay great. Now if overtraining is a concern, you go around figure out, what's one way to measure overtraining. Maybe HRV is a way you can measure overtraining. Okay. Fantastic then I'm going to invest in some HRV. And now you test that, whether or not that change it, yes or no well. So my point is like you identify a specific problem and then try to identify one way to quantify or analyze that problem, test the hypothesis and then the key here is collecting the least amount of data possible and with the least amount of technology possible.

Because don't let these mega companies fool you. It's like, "Yeah. Use our watch. We'll give you 55,000 data points a day?" It's like that's completely unusable and you'll end up with a bunch of false positives. You'll end up with things that are not really there because they're just going to hit you with data after data after data and any good scientist knows that's bad science. You don't just collect every variable possible. You're supposed to have a very specific goal in mind and address and answer that question.

You don't just collect everything and the see what shakes out at the end unless you're doing exploratory science that's a different type of science. Like this is trying to answer a direct question and use the least amount of technology possible and at that point it doesn't really matter which one you use or which brand you like or any of these things and then you move on. You adjust and move on so it's the very basics of science, right. Identify a question, identify hypothesis, test the hypothesis as the best way you possibly can move forward but yeah almost every time this is according to Tim Ferriss.

Every time he's been led to wrong conclusions with his training data it's because he over collected data. And I think that's pretty reflective of what happens to a lot of coaches as well so if you're like Florida State or Notre Dame and you've got two or three full-time sport scientists whose job is simply to collect data off of GPS watches then maybe, you can take that approach and just collect you get meta-data and go from there but the vast majority people don't have that so if you

have a specific issue in mind use tech to try to answer the problem and then move on. But that's my advice.

DANNY LENNON: Yeah. That's a perfect advice and actually reminded me some of those examples that you were giving of something I heard from Mike Tuchscherer, who obviously for people who don't know elite level power lifter for many years, has won everything you can imagine probably one of the best, if not the best raw powers and coach on the planet at the moment and one of the things he did for I think, maybe two three years every training session continuous for two to three years was measure bar speed with a Tendo unit and started using that in place of RP and essentially basing all those RPs and what the Tendo unit was telling him and in more recent times he said he's came back to using more kind of self-rated measures of RP in combination with the Tendo but mainly just rating on how it actually felt as opposed to what the velocity on the bar was telling him because that gave him a bigger picture of actually what's really going on.

And I think that example just popped into my mind because it highlighted at the point you were expertly making Andy, of how they may show us something but most often when we look at for that the real bigger picture trends how kind of we subjectively can rate something can be far in advance to that. So we're coming close to time here so just before I finish I wanted to ask one final question and that I promised my friend Kieran who's a strengthening coach that I would touch on because it came up in a conversation we've had recently.

So Kieran has fought as a combat sport athlete for many years. Has trained fighters as well and one of the things that we were chatting about and I'd be interested to hear your thoughts on and he given the fighters that you've worked with is assessing readiness to train in combat sport athletes given that number one; in certain circumstances these may be remote athletes are working elsewhere or even if there are local athletes, you can have them show for an S&C session but when they go back to the gym and are sparring and so on you may not see them for every session.

So you lose one of those tools that a lot of S&C coaches have of being able to like read body language, get to chat to them just see how they're moving and so on to assess that. Is there anything else you recommend to coaches in that position who are working with these types of athletes of being able to better manage that overall workload that they have when they're outside of your control?

ANDY GALPIN: Yeah. That's a fantastic question. Here's the honest answer. It's virtually impossible. That's the honest answer the best you can do though, I think that's, you know, that's really where the conversation is to go. Well actually an interesting paper just came out specifically on this. But the papers really just came out suggesting again RPE being a phenomenal indicator of combat sport readiness. So that was published in the last two months or so.

So I would say that. I mean if you're especially if you're a remote coach if they can just text you their RPE in the morning or if you can get them to fill out a Google Drive or something like that that we can constantly have checked. I mean that's generally what I do is that they have a Google Drive setup where they check in their body weight and their RPE or I don't even call it RPE I just say like, you know, how excited are you today to train? And they just, you know, on a scale of one to ten where are you at today? So that's one way to go about it I would say that, you know, this is this is the reality of it. Some of my athletes don't do that very well.

Some of them do it phenomenal and you're going to have to adjust these things based on the individual person. Sometimes that extra little step drives them nuts and it gives them anxiety and you have to make the conscious decision as a coach going like well what's more important me adding this extra little thing that gives them too much anxiety or me going you know what, I got to cut this because it's doing greater harm than it is doing greater good. So if your eyes are not on them all day, I don't have any athlete who I get to go to practice with even multiple times a week. I've got just way too much even the local ones.

They got way too much going on, they're driving across the, you know, all over LA and I don't have that kind of time so I've never been able to really take an athlete through every single day. I have some that are very good, that'll text me or upload to the doc every day but you do the best you can and you really pay attention to, you have to be as perceptive as possible to what they're feeling, what they're going through and if you can get them to use HRV, great.

If you can get them to use I have some that just test their resting heart rate every morning or send that over and that's a very crude marker but if you see if one day all of a sudden jump up from 38 you know from 38 to 42 and all the sudden one day it's 61 okay that... something's going on here so or, you know, I try to have a good honest conversation with them and communication with them and as much as I can a lot of the times look, they'll open up to me when they won't open up to their sport coaches because they know that like I can give them a little bit of a saving grace and they can text me like very leading questions like, “No. I'm just you know I'm wondering how much I should train today,” you know you're like you can tell they're trying to beat around the bush you're looking for me to go, “Yeah, yeah. Take the day off.” And they're like, “Okay, okay, okay.

Well it's best. Okay” And I'm like all right because only really honestly a couple of people I've ever interacted with that are professional fighters, the honest answer is if they're in the UFC they don't have a problem being motivated to train hard. So I've never worried that when they're asking for a day off, I'm never worried going, “You’re just being lazy right now.” I’ve had one who is kind of like that and well, two basically two that were like that. But the rest of them I'm like if they text me and they're even insinuating that they're tired they're probably really really hurting.

Because with these folks and they say like I'm kind of sore, that usually means the rest of world I'm crippling sore, I can't move. So like if I get that text I'm like, whoa. Okay. We're doing something different today. Where if I get a text is like man I haven't slept in three days. I'm not sore. I'm just man. I'm like oh, okay like you're really stressed right now

from training we need to or maybe not like the stress from media.

There's stress from other things so I'll be like, you know what we're doing more good here or harm than good let's throttle back today because I know the next you know or especially hey, look I know tomorrow you got to take off to Brazil to do this media tour and you're not going to sleep well because you don't sleep on planes. So you know what? Let's back it down today and I want you to extra rest today because I know the next three days, you're not going to sleep at all. You just you just have to use your practitioner. You have to use your sports psychology.

You have to use your friends. You have to use your scientist, heart at the same time and just try to make the best decisions possible.

DANNY LENNON: Perfect. Thanks Andy. Before I get to the very final question, where can people find you more online? Where can they find you on social media? Any particular thing you want to check them out where's the best place on the internet for people to go?

ANDY GALPIN: Well you can get the book, it's called "Unplugged: Evolve from Technology to Upgrade Your Fitness, Performance & Consciousness," and that's up on Amazon or Barnes & Noble, you know, wherever you want. That's easy to find. My social media is pretty easy, you know, @DrAndyGalpin. I'm kind of all round and then you can always check out my website andygalpin.com and that's all free. There's no subscription, there's no newsletter and basically I take as many of my class videos and my lecture videos that I could possibly do and I put them up there and just give away all my nutrition, training, strength conditioning give all that information I possibly can. So any of those places whatever suits you most.

DANNY LENNON: Awesome and for every one listening I, will that all in the show notes for you to go and check out so please do so and with that Andy that brings us to the final question we always end the podcast on and this can be to do with something

completely outside of anything we've discussed today. And forgive me for it being quite a broad open question but it's if you could advise people to do one thing each day that would have a positive impact on any area of their life what would that one thing be?

ANDY GALPIN: So that's I think a pretty easy one. It's the old adage of try to walk a mile in their shoes. Another way to think about this is I have a little exercise that I try to do or whenever something I see something on TV or on social media or yes, you know one of my neighbors I have a bad interaction with and I feel that urge to jump and complain or yell or some things like that. I try to envision three possible scenarios where if I did that I would look very stupid. So something like this. Imagine somebody cuts you off in your car and there's no reason for them they cut you off. The gut reaction is to, you know, say something mad have a bad emotion whatever.

But imagine now, before you allowed to do that imagine three scenarios in which. Imagine you got out of your car and yelled at them, and all the sudden, you realize their wife is in the back of car trying to have their baby. He's trying to fly the hospital. Oh shit, you'd feel like an asshole, right? You'll a huge asshole or whatever. Or that person is late for work because their kid was sick today and they're working three jobs and they're going to get fired, they're like one more time. Whatever happens to be right.

And it's not very difficult to envision those scenarios and you're like, you know what the crazy part is, it's probably more likely something like that is actually happening than not. And so if you just walk around your life with that, when somebody does you wrong or something bad happens to you, it's probably because something legitimately have was more important than calling me back on time or something. And I think if we can all have that attitude of empathy a little bit, it's a lot easier for us to be like, oh, well, I don't blame you.

And life's just a lot better. So trying to shift to that mindset and it's the same thing I do with science. When somebody has a poor quality paper, I try to envision going, well, I wonder why they did that. I probably don't understand why

they did that study that way, as opposed to just criticizing them, try to really understand why they do what they did, and you'll probably have a lot more empathy for that person.

DANNY LENNON: Wonderful way to wrap this up. With that, I want to say thank you so much, number one for taking the time out to do this. And number two, for great information you've given today and for the conversation and then in kind of the broader terms, just for the work you continue to do, I think it's extremely refreshing and I'm very grateful for seeing someone try and communicate the kind of core principles of science objectivity. I think honestly, just being a bit more careful with what message we give out. The work is very much appreciated. Thank you for all you're doing my man.

ANDY GALPIN: Pleasure man. I really appreciate the compliments, and hopefully some people gain something out of this so, awesome.

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