

The Triathlon Summit - Learn How to Use a Power Meter to Get Your Fastest Bike Splits Ever with Hunter Allen

KERRY: I'm going to start the call this evening. Hunter Allen is a Power Meter Training expert. He's widely known as one of the top experts in the world in coaching endurance athletes using power meters. Hunter Allen's goal has always been to teach athletes how to maximize their training and racing potential through professional analysis of power data. Athletes that he's coached have been Jeremiah Bishop from Volkswagen Trek and he was a US Champion mountain biker in 2008. Daniel Lloyd who did very well in the 2008 Welta. Sue Heywood is a 2007 World Mountain Bike Champion. I could keep going on and on about all the great athletes that he's coached and helped rock it. Lastly, Hunter himself is also a former professional cyclist for Team Navigators and has raced over 17 years in Europe, South America, USA and Canada. He has over 40 career victories to his credit. So Hunter is extremely knowledgeable in the sport and in power meter training. With that, I welcome Hunter Allen to the call. How are you doing Hunter?

HUNTER: I'm doing great, Kerry. Thank you. I appreciate you having me on here. This is exciting.

KERRY: We're all very happy to have you on, for sure. Let's start with the first question. Why don't you give us a little bit of background on who you are and how you started with this power training craze, if you will.

HUNTER: All right. Thanks. Like you said, I've been racing for a long time. I started racing when I was 11 and went from BMX to mountain biking to road racing. Then once I started road racing I was trying to figure out how to be the best athlete that I could be and was always researching new things and trying to figure out how to be the best athlete I could be. I wanted to have a coach too and there were no coaches really in the late 80s and early 90s.

So when I retired from pro racing I had a few people who I was helping out. I started coaching and that kind of blossomed from there. At the same time in the late 90s the power meters just started. I had some athletes who, in the early adopter phase, were asking about it, "What do you think about these power meters? Are they worth it? Are they going to do anything? Would you train me with one if I buy one?" So I said, "Yeah, sure. I'll figure it out. I can see what's going on. This looks like a perfect opportunity to kind of step in here and see what's up."

So I started doing that with some athletes and immediately realized there's no way I'm going to be able to coach somebody and work with them until I understand personally what 300 watts means to me, what 1,000 watts means, what 10 watts means. I had no relationship with that. I had trained with heart rate for years and years and years. So I didn't really know.

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That really kind of got it started. That started moving us forward towards thinking about what were the things I really wanted to do as a coach and how to get there and understand what it means from a coaching perspective, this kind of dose and respond relationship.

That kind of moved me forward a little bit in 2002. I started working on some software with a good buddy of mine, Kevin Williams. We started to build CyclingPeaks software. Once we built CyclingPeaks software and really became serious, then it made a lot of sense to continue to push that forward and spawn the book about training and racing with a power meter and how you do it step by step, and then seminars, webinars, etc. Keep on going, right?

KERRY: Yeah, definitely.

HUNTER: It's been a lot of fun and I think that certainly using a power meter has become more and more popular. I think that's because it works. It's like one of those things that, fads are fads because they don't really add value. That's where this is truly different from a fad in the fact that it's truly valuable and it works and people get stronger and they ride better. So that makes a big difference too.

KERRY: Awesome. Good deal. Can't argue with results.

HUNTER: Exactly.

KERRY: Yeah, for sure. What are the specific ways that triathletes can benefit from training with a power meter?

HUNTER: Good question. Triathletes are a unique breed in the fact that they're doing three sports. That continues to boggle my mind, because I know how hard it is just to train for cycling. I've coached many triathletes in the past and still do. Triathletes probably, in some ways, can benefit more from using a power meter than sometimes cyclists, just because of the fact that it's about pacing.

I talk about this in my seminars and things as well. When you kind of get rid of all the tech stuff and you get rid of all the aerodynamic stuff and all the hard training and everything, what is the sport really about? What is the sport about? The sport of triathlon, the sport of cycling, the sport of running, the sport of swimming, it's about pacing. It truly is a sport of pacing. Some people happen to like to do it on the bicycle. Some people happen to like to pace themselves swimming. Some people happen to like to pace themselves running. Some people like to do all three. When you kind of break it down and say, what is the raw nature of the sport? It's a

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sport of pacing.

So from the power meter perspective pacing and figuring out your optimal pacing for each event as a triathlete, whether that's a sprint or Olympic or Ironman or say you're just a time-trial or a cyclist, you just do 40K time-trials or 10-mile time-trials, you can figure out what your optimal pace is so that you finish with nothing left in the tank, if you're just doing a time-trial cyclist, or if you're a triathlete, you've got enough left in the tank to run 26 miles. Truly the key is to say, "Oh wow, here's my pacing tool to make sure that I stay within a range that I know that gives me the best performance." I think that's what we're all after is trying to figure out, "How can I ride at the right pace so that I know I did my personal best? Should I ride at 20 miles an hour? Should I ride at 16 miles an hour? Will I have enough left for the run?" Those are always those questions in the back of your mind.

With a power meter, once you know some basic facts, boom, here's the number. Ride at this percentage of what we call your functional threshold power - and we'll talk about that in a little bit. Then you're on it.

KERRY: Good deal. What I should have started out asking you is, what are the reasons why people should use a power meter, more than anything?

HUNTER: There are a lot of reasons why. The pacing is one of them, one of the bigger ones as a matter of fact. So that's an important thing. Two, it adds more meaning to heart rate monitoring. Your heart rate is just a measurement of really how fast your heart pumps. It doesn't measure how work you're doing. I've been on the starting line of a lot of bicycle races and just standing there with a heart rate of 160. So it doesn't really mean that much, in terms of work. It adds meaning to it though, it's still relevant.

The other thing is this idea of a dose and response system. So heart rate training is what we call response-response. Where, "I want my heart rate to go to 180." Then your heart rate goes to 180. But what was the dose? What caused it to go to 180? Was it because you just sprinted up a hill? Was it because a dog started chasing you? Was it because a car came out in front of you? Was it because your buddy just attacked and you're trying to get on his wheel? We don't know the dose, we just know the heart rate responded.

With power you understand the dose. Like, "Okay, I'm going to do 300 watts. I push down on my pedals, the number comes up on my power meter. There's 300 watts. The response is my heart rate goes to 180. My breathing increases. My VO2 max is up. My rate of perceived exertion goes up. The lactate in my blood goes up." All those things are responses

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to the training dose. That's another big reason to me, the fact that now there's not this kind of unknown, ethereal, "Should I ride 20 miles today or 40 miles today or 100 miles today? Because I rode 100 miles 2 weeks ago does that mean I'm better today?" You don't really have that understanding until you can actually measure the training dose. Those are the three big ones anyway.

KERRY: Cool. Awesome. So why should athletes race with a power meter?

HUNTER: Well, racing is definitely a key part of it and another benefit of using a power meter. Back to that pacing idea and the fact that if you're in an Ironman or if you're in a half-Ironman, you know exactly, "Here's what I can do and this will allow me to get to the finish line with enough in the tank to do the run and do it well. Two, the next thing you learn from racing is that we always do our best, almost 99.9 percent of the time we do more in racing than we do in training. So we have our best numbers in races. That kind of lets us know some of our limits that we thought were limits in training really aren't our limits. It kind of breaks some of those barriers.

The next thing I think that we learn is from our failures. Some of the best data that you can possibly get, whether it's in a triathlon, whether it's in a criterion, whether it's in a time-trial, whether you're in a break-away in a road race, whatever that is, is when you fail, when you fall apart, when you bonk, when you get dropped out of the break-away, when something goes wrong. But you can go back and analyze it and you can say, "Oh wow, here's what happened 10 minutes before, here's what happened 5 minutes before I got dropped. Here's what happened the minute before. Here's what happened 10 minutes afterwards." That's a really important thing because we can take those failures and then we learn from them and change our training. We change the things that we do. We change our nutrition or we change our tactics or we change our strategies. By all means, as far as I'm concerned, everybody who has a power meter should race with one. That's your best data.

KERRY: Yeah, sure. What do pros exactly do when they train with power? How do they utilize it?

HUNTER: It's interesting to think about this. I love and enjoy car racing and all that stuff that happens in Formula One. One of the things that's really cool about cars is that we get these trickle-down factors, trickle-down innovations, engineering ideas and things that come from car racing come down in our normal cars. The same thing with the NASA space program. It trickles down and comes down to us and we get to use them in our everyday life.

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But interestingly enough with power meters it's been a trickle-bop. So it gets kind of funny because there are a lot of people out there who are relative beginners, when compared to Tour de France athletes or Ironman competitors, that know way more about training with power than any of the pros do. So the pros are starting to become more and more educated about that now. That's a big deal. That's really upped the level of pro racing.

So when pros use them, right now the best road pros like Lance are riding with one. You see all these guys who are incredible athletes, and women too, a lot of women actually, using them. They're using them in a couple of ways. One, they're using them to correctly dose themselves with the right training load. So they're defining the training load. They're trying to figure out, "Okay, I need to train in this training zone. I need to train this many miles or this much work," essentially. Once they know they're training load they can then kind of optimize that training load, making sure that they do just enough and not too much. If you can win a race by training 10 hours a week, why would you want to train 15 hours a week if you can win it on 10 hours a week? It makes more sense that way.

So the second thing is then tracking that training load. Once we know it we can track it over time and then look at trims. Then say, "If I do this many training stress core points (I'll talk about that in a minute) then that's going to make me too tired to do the workout the next day." So kind of optimizing that is a real key part of it as well.

KERRY: Good deal. Awesome. Where can people get your stuff? Information, books, stuff like that.

HUNTER: Sure. A couple different places. PeaksCoachingGroup.com is my coaching website. I've got a bunch of articles on there and a whole ton of different things on that site. I do webinars as well. That's a lot of fun. I've got a coach webinar tomorrow night that is just for coaches. I do those once a month. I do athlete webinars once a month as well, just talking about power training. Everybody can see my screen and stuff. That's a lot of fun.

Then our software is on TrainingPeaks.com. You can get my book, "Training and Racing with a Power Meter" on my website. If you buy it off my website I'll send you an autographed copy.

KERRY: Good deal. How do top pro triathletes use power meters?

HUNTER: The biggest thing to me is again, back to this idea of pacing and really metering out the training dos. I work with a very high-level pro woman for quite a few years. We built her training around Ironman Wisconsin. It's a very difficult Ironman to do, very difficult one to train for, because it's

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just so incredibly hilly. What we did was we kind of first defined the demands of the event. She was fortunate enough to be able to go out and pre-ride the entire course. She did it a couple of times. We captured her power file from her pre-rides. I knew how many hills there were, which is seemingly endless, and how much power she did up the hills, what her power was when she was between hills, all that information. So once I understood the demands of that event, then I was able to figure out the type of training that was needed to do well in it. So it's like, "Gosh, in 112 miles you're going to have to do something like 70-something hills." Some hills are 20 seconds long, some are 2 minutes long, some are a minute long, some are 5 minutes long. Then from that we made sure that she did enough hill repeats, just so she could handle hill repeats. If you start to think about it and look at the training plan and you're like, "70 hill repeats? I'm going to do 70 hill repeats today? No way!" Right? But that's what you're going to do when you go do Ironman Wisconsin, you're going to do 70 hill repeats, or more. So you have to be prepared for that. You have to understand that that's part of the event.

Then you have to figure out what your pace is up those hills. Do you kill it on every hill? No, you can't kill it on every hill because you won't have energy to run at the end of it. So you have to figure out the optimal pacing for the length of hills. So with shorter hills you can go a little harder. Medium-length hills you kind of back off a little bit. Longer hills, stuff that's 5-minutes long, that's done at an even lower intensity.

So those are key parts of kind of using it as a pro, and I think for anybody really. It's defining the demands of the event. So once we define it we can train directly and specifically for it. Then once she was out there on the course, then she used her power meter on her handlebars to use it as a governor, like a ceiling. "Okay, I can't go over 240 watts on this hill. I can't go over 280 watts on this hill." Then that allowed her to kind of mentally check in and make sure that she was not overexerting but then also not under exerting as well.

She did phenomenal. She ended up riding her very best Ironman. She came out in the second fastest bike split, came out and had one of the best runs and was one of the top five women overall that year in the pro women. It was her second Ironman ever. It was really fun to do and see how that works.

KERRY: Yeah, that's awesome. Great stuff. We were talking a little bit about his before, we just mentioned it briefly. What is functional threshold power?

HUNTER: Functional threshold power, this is something that Dr. Cogan and I had to define for the book and for a bunch of articles we wrote. We had to come up with this because there's this whole threshold misunderstanding and

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confusion around threshold. There's the anaerobic threshold, there's the lactate threshold, there's all these things that every exercise physiologist kind of comes up with. It's really confusing. You're like, "I don't understand. What am I thinking about? What am I trying to do?" We just said, "You know what, it's functional threshold power."

It's power we're measuring, so it's threshold power, not lactate threshold. If we were measuring lactate in the blood it would be lactate threshold. It's threshold power. It's functional because the test is you go out and you crush it for an hour. You go as hard as you can for an hour. Whatever number you come up with, whether it's 210 watts, 330 watts or 420 watts for an hour, whatever it is, that is your functional threshold power. Now, you have to go as hard as you can. It's not like one of these deals where you just stand back and run hard at the end or end up coasting along and looking at the trees and stuff and going, "Wow, that's a really nice house." [Laughter] You have to really kill it. And that's tough.

A lot of times I'll have clients who, if they've never done an hour time-trial before, they've never done that, then we can do a shorter test and take about five percent off. You can also do a 20 minute test. So 20 minutes as hard as you can go, and then subtract about 5 percent from that number. That should be very close to the number that you'll get if you did an hour time trial. Sometimes it's higher, sometimes it's a little lower. But five percent is pretty darn close. That's really what we talk about when we talk about functional threshold power.

KERRY: All right, good deal. If someone is out there and they're using power when they're training, what exactly are they looking at and trying to hone in?

HUNTER: Sure. I think that when you're out there in training and you're doing your ride, you come back to, "What's the purpose of my ride?" If the purpose of your ride is just to ride an endurance pace and go out there and get in four or five hours and build your endurance, then you're using your power meter as that kind of governor. Say, "Okay, don't go above a certain number." Maybe for you that might be 200 watts or whatever that is. Say, "I spend most of the day under 200 watts. Not down to 100 watts, but at 200 watts, so I know that I'm in the endurance-training zone." That's a key element of it, learning your training zone.

Back to that functional threshold power thing, that's what we call 100 percent. So you've given 100 percent around functional threshold power. Then the training zones or training levels are defined around that 100 percent. So underneath that threshold we have what's called tempo pace. Tempo pace is between 76 and 90 percent of your threshold power. Underneath that we have endurance pace, which is 56 to 75 percent of threshold power. Then anything underneath 56 percent of threshold power,

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that's what we call active recovery, riding very easily. Above it, on the other side of it, you're training your threshold essentially when you're between 91 and 105 percent of functional threshold power. Above it then you can train your VO2 max. That's between 106 to 120 percent. Then we have what's called anaerobic capacity. That's 120 to 150 percent, or more. Then we have what's called neuro-muscular power, which is level seven, or training zone seven, which is your best, maximal effort, like a sprint.

The key to training optimally here is understanding, "What's my goal? Am I trying to improve my threshold? Am I trying to improve my VO2 max? Okay, I'm getting ready for a short criterion. Maybe I'm going to need to improve my sprint." Or maybe, "I'm doing a Half-Ironman so that's mainly going to be threshold and tempo pace." Once you know your goal, then you train predominantly in that zone. If I'm getting ready for a Half-Ironman I've got to run 56 miles. I know that most of the time I'm going to be riding at what we call upper-tempo pace. So probably around the 80-85 percent of threshold power.

Then you do intervals that are a little bit harder than that. You do intervals at 90 percent. You do intervals at 100 percent, in order to really increase your threshold power. Then all of a sudden the old 80 percent, which may have been only 200 watts, now is 230 watts and that's 80 percent of your functional threshold power. I don't know if that's too confusing, that's a lot of numbers there.

KERRY: No, it makes sense. Definitely.

HUNTER: Hopefully that makes sense.

KERRY: In a lot of ways it's almost like using a heart rate monitor. It's kind of broken down the same way, except obviously there's pluses and minuses to that..

HUNTER: Exactly. And you know, we have training zones with heart rate, those correlate to power training zones as well. For example, the threshold power 91-105 percent, if you did threshold heart rate... A lot of time training zones are built on max heart rate. If you look at threshold heart rate we're kind of talking apples to apples. Then when you say, okay 95-105 percent of threshold heart rate, 95-105 is almost identical to 91-105. You've got to know what 100 percent of threshold heart rate is as well. So those kind of heart rate zones are part of them and we certainly look at that. The problem with heart rate when you have to train, especially on longer days or hotter days, towards the end you get what is called cardiac drift. So all of a sudden it's like, "Okay, I'm doing 200 watts. When I did 200 watts at the beginning of the ride my heart rate was 130. Now I'm doing 200 watts my heart rate's 140." Or maybe, "I'm going really hard

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and I'm doing 300 watts at the beginning, my heart rate is 170. Now when I do 300 watts my heart rate is 180."

So you're still training with the same dose but now your heart is having to pump faster in order to get that same workload. That's where that kind of disconnect happens and you have to be careful with heart rate.

KERRY: Sure. What about intensity factor? What exactly is that and why is it important with training with power?

HUNTER: I probably ought to back up a little bit and talk about intensity before I get to intensity factor. Part of this idea of training with power is that training stress score, I needed a score. Dr. Cogan is an incredibly brilliant man. He's really, really smart. I said, "Hey, you know what? I need a score. I need a score for every ride that I do or one of my athletes does. Power meter measures it and records every second. It measures our work. We've got to be able to come up with a score for this, for each ride." So a week later he comes back and, "Eureka! I've got it. It's going to be called training stress score." It's based on functional threshold power. You get more points as you approach functional threshold power. Then once you go past it you get even more points in an exponential way.

We came up with this training stress score because I wanted to periodize training for my athletes not by hours. Here where I live, in Virginia in the mountains, a three-hour bike ride, you might go 40 miles. Versus on the East coast of Virginia where it's absolutely dead flat, in three hours you can go 70 miles, maybe 80. So completely different. So mileage and hours didn't really work. It didn't really make sense in terms of how far to run or how hard to ride.

Then we do measure work in a power meter as well. That's measured as kilojoules. So a joule is a watt per second. Then we can measure kilojoules and how much work we've done. The problem with kilojoules though is it doesn't take into account intensity. The same thing as miles and hour doesn't take into account intensity. Kilojoules are the same thing. I can go and do a 3,000 kilojoules ride and I can do it in 10 hours, and ride really slow. Or I can do a 3,000 kilojoules ride in about three and a half hours and be killing it the whole time and be shattered at the end. Completely different energy systems that you train.

So with training stress score we had to have a way to calculate intensity. That's what intensity factor is. So intensity factor is a decimal. So it goes from .01 all the way up to 1.8 or 9 or something like that, or higher. What it is is it says, "Okay, 1.0 is functional threshold power. .83 means 83 percent essentially, of your functional threshold power." So if I go out and do a training stress score ride... Back to training stress score for a second

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here. When you do an hour at functional threshold power you get 100 points. That's the goal standard. You do a 40K time-trial essentially, as hard as you can go, you get 100 points. Your intensity factor is 1.0. That's the key is that you know where you get 100 points and you get an intensity of 1.0.

So then you're now calculating the dose. I'm getting a score for this ride. I'm going to go out and I'm going to do a four-hour ride and I'm going to get in all these intervals and stuff and I come back and my training stress score was 250 points. My intensity factor was .75. So that means that I did the equivalent training stress of basically two and a half back to back 40K time-trials. But I won't be as sore as if I did that back to back because I did it at an intensity of .75 or 75 percent of my functional threshold power. Okay? So you still get the same training stress but maybe not the same soreness and such like that. That's part of intensity factor.

As a corollary to that we have this other idea called normalized power. Normalized power is this way of taking into consideration how the body feels and how the body felt and how many watts the body felt like it did. If you go over a hill, maybe you're going up the hill at 350 watts, you go over the top of the hill and you're pedaling not at all, and then you go down the bottom and you're on the flat and now you're pedaling 200 watts, then you go back up another hill within 10 seconds or 15 seconds and you do 500 watts up that, that may be a span of 2 minutes. Well, if you average all the numbers you get zeros when you weren't pedaling, 450 watts when you're going hard, all these numbers together, it may say, "Well, the average is only 120." But man, you killed it up those hills. You went really hard. It doesn't make sense. "That's not what my body felt like." It really isn't.

So Dr. Cogan came up with this idea of normalized power to take into account what the body feels. So I say, "Well, your normalized power might have been 320 watts for that 2-minute period of time because of the hard hills, the short recovery and the hard hill again." So normalized power is a huge part of intensity factor and training stress score as well.

KERRY: Cool. Very interesting. All very useful numbers, for sure. You're recognized as one of the power training experts in the world. What do you think is the Holy Grail of coaching with a power meter?

HUNTER: To me it's this idea that really when I started coaching I wanted to be able to...I can get anybody fit, right? As a coach, that's easy. Here's a training plan. Do the training plan and you get fit. That's not hard. But, what is hard is having the athlete as fit as they possibly can be on the day they want to be. That's tough. That is not an easy thing. That's part of it. I want to make sure that on September 8th when I go to Ironman Wisconsin, or

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whatever it is this year, I'm going to be at my peak of fitness. So to me that's kind of the Holy Grail of coaching and training with a power meter. You can use the power meter to predict and create the best peak of fitness that you ever had.

For everybody out there who watches versus [?] and their bike races and Dillon Paul on the TV and listening to their things, they talk about the mythical form. "Oh, Tom Blumenson's got great form. This guy's got great form." It's like this nebulous, ethereal, kind of mystical concept or somebody waves a magic wand over these cyclists and they get form. It may even seem like that for that. "I don't understand it but man, I've got it and I'm killing everybody."

But really, this form is kind of two components. I sat down a couple years ago with one of my heroes, Greg Lemond, for a couple days and we just... One of my dreams come true, spend two days with Greg Lemond and talk about training. We spent a couple days just chatting about training. It was outstanding because I said, "I've got to ask you Greg. You won the Tour de France. What was it like? Were you on form before?" He was like, "Oh man, I was flying. I was killing it. I was just crushing everybody. I was riding great. I was just on form. Totally flying." I said, "Well, what about at the end of the Tour de France. Were you on form then?" He was like, "Well, I was pretty tired. But I was better than everybody else." I said, "When you're tired you don't have form?" He's like, "No, you're so fatigued you don't really have form then." Before the race you do have form because you're fresh.

So at the end of the Tour de France you may be super fit but tired, so you're not really on form. Where vice versa, let's say if you just sat on the couch for a couple of months and then raced the Tour de France, you wouldn't be on form either because you're not very fit, but you're really fresh. You've got to have the two, where you have fitness plus freshness. That's a key part of it. So that's what form is, fitness plus freshness.

Balancing those two things is what every coach does with their athletes. That is key. So, "I want to be as absolutely fit as I can on September 8th but I also want to have just the right amount of freshness to make sure that I'm not going into it too tired and I'm also not going into it too rested and have even lost fitness." That balance is really a key part of it. That I think is kind of the Holy Grail of coaching, understanding this kind of fitness plus freshness equals form, using your power meter to understand how those things work.

In our software, the Training Peaks WKO Plus software, the power meter software that I co-developed, we have a chart in there called the Performance Manager chart. That's what that chart does. That's the chart

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that allows us to balance fitness and freshness based on your power meter files. If all you ever did was just ride your bike and collect power data, and you didn't even look at your power meter file, I could tell you where your form was at any time, just because it measures you're training stress and it measures how you respond to that training stress. I can wave my magic wand at my computer and tell you all kinds of crazy metrics about yourself and what you're feeling and how you're riding at any time during the year, just because you are getting the data about how your body was responding to the training stress. That's really the Holy Grail, peak your athlete when you want to peak them.

KERRY: Yeah, right on. So, with all these numbers and things like that, are you getting pretty good at doing that now? Do you ever have times where you've got all the numbers and everything lines up but for whatever reason with the athlete it just doesn't work out and there's other things that you have to adjust for them?

HUNTER: Sure. Life happens, right? That stuff we can't account for. You spend a year with one of your athletes building up to the right form and all of a sudden they find out their wife's cheating on them. The best form of their life goes out the door. Or they get fired from their job or something traumatic happens. Life happens. You can't account for that kind of stuff.

We can account for recovery time. A typical athlete who is, let's say an older athlete, 55 or older, even 50 year old athletes, even some 40 year old athletes, recover a little more slowly than the 20 year old ones do. So we can account for that recovery. So we can adjust for it. That's a key part of understanding how that whole system works.

The other thing that is a challenge as well is finding out what the optimal taper period is. Each athlete tapers a little bit differently and responds to the taper a little bit differently. The Performance Manager really helps you get close to that and you can kind of do some practice tapers leading up to your key event so that you can understand, "Oh wow, if I taper for two weeks beforehand I'm stale. If I only taper three days before I'm not quite recovered yet." So definitely think about those things in consideration here.

On the whole, it's pretty darn amazing. It's pretty incredible. I've got a guy right now that I'm coaching on the Cervela, testing. Tomorrow he's racing in Flesh Balloon, Dan Fleeman. We've got his training dialed in. He goes into Flesh Balloon tomorrow not quite in balance, neither fresh nor fatigued. He's going to be just a hair fatigued. But his peak is next week for the Tour of Romandy. He wants to really ride well for the Tour of Romandy, which is a really good race with lots and lots of climbing. He's a good climber. So when we go to the Tour of Romandy he's going

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to be much fresher where he'll be a positive 15 points, what we call training stress balance. So he'll be fresh and when he gets to that state of the race. By the end of the race he'll be what we call negative in that. So he'll probably be about negative 45 stress balance points at the end of the race.

When you've got it nailed with an athlete, you've got it nailed. It'll be fun to see how he does. I'm sure he'll do really well. It's fun to workout.

KERRY: Awesome. Good deal. Where can people get your stuff again?

HUNTER: At PeaksCoachingGroup.com. I've got a lot of free articles there. I do webinars, athlete webinars every month. For coaches I have great resources there. You can get a continuing education credit by listening to my webinars. You can also get my book there, training and racing with a power meter and I'll autograph it for you. Then our software is on TrainingPeaks.com. The power analysis software is called WKO Plus. That's short for 'workout.'

KERRY: Cool. There's all kinds of awesome different training tools coming out there. You've got heart rate monitors, power meters, all that stuff. We're getting a lot of good information. GPS is allowing us to do things with running. What do you see in terms of the future with training with power and all this new technology? What are some of the things that are going to be happening out there?

HUNTER: There's a couple of new things on the horizon. I definitely think GPS is an untapped tool. Right now GPS is more of a toy than it really is a tool. I'm working on some things that are going to change that. The beauty of a bunch of these new power meters are the fact that they talk a common language, which is called ANT Plus. You can buy a power meter, like Power Tap, ANT Plus a Garmin 705 head unit. Or you can buy an SRM and have a Garmin 705. So they talk all the same language so it kind of divorces the power meter from the actual head unit itself.

So I've got some things in the pike here coming down for GPS that, when you have GPS in your power file, is going to be very useful. I'm really looking forward to some upcoming features that we've got coming out in our next version of WKO Plus. GPS is one of them and understanding what made your race even better. Sometimes it's not more power. Sometimes that's not the answer. Sometimes other things are factors and GPS can help us with figuring those out. So that's going to be fun to look at.

The other thing that is going to be interesting too is there's this thing called quadrant analysis. Quadrant analysis is this idea of it's not only just

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300 watts, but when you produce power it's how hard you pedal times how fast you're pedaling. It's a simple equation but you can produce 300 watts if you pedal really fast in a tiny gear. If you pedal fast in a tiny gear to do 300 watts, that recruits a different type of muscle than if you push a really big gear, like 55-11 really slowly to produce 300 watts. That's a different type of muscle fiber. The 300 watts number is the same but the type of muscle fibers are different. I talk a little bit about this in the book, "Training and Racing with a Power Meter." Quadrant analysis helps us to understand that.

So I've got some new things coming out with quadrant analysis that I think is really going to open some people's eyes about training specifically for the demands of their event. So kind of back to that idea of training specifically for the demands of your event. If you're a mountain biker you have a very specific muscular demand. If you do all your training on the road, that's a completely different muscular demand. You have to not only train the wattage but you have to also train the muscular demand as well. That's, I think, going to be exciting to see as we come out with some new tools for that and open some people's eyes there.

The last thing that I find interesting is with a power meter out there called the iArrow or iBike. These guys have essentially a poor-man's wind tunnel. They have the ability on their power meters now to measure real-time coefficient of drag. That means that you can optimize your aerodynamic position without going to a wind tunnel and doing some tests. It takes a little bit of engineering and a little bit of homework and figuring out some of the stuff behind the scenes, but it's not hard. It's pretty darn sweet when you're on your bike out there and all of a sudden you bring your arms in a little closer on your tri-bar or you flatten your back a little bit more or you tip your arrow helmet back a little bit more and you see the coefficient of drag numbers go down, right there on the screen. Like bam! Going down right now. That's cool. You've got to have a power meter that talks this ANT Plus to talk to that iArrow to get these numbers, but once you've got them, you've got them and then you can do stuff with it. It's some fun stuff.

One of my wish list things is I want respiration rate on my heart rate strap. I don't know if we're going to learn much from it but why the heck don't we have respiration rate on our heart rate straps? I don't know. We've got a strap around our chest. The thing should be able to measure respiration rate. So, anyway.

KERRY: I'm sure it's coming. Good deal. We've got a few people here on the webcast asking a few questions. Would you like to take a crack at a few?

HUNTER: Sure.

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KERRY: Okay. We've got Greg Woods from Stoughton and he says, "I am training for Ironman Wisconsin and want to know how to train with a Power Tap to improve endurance and power for those long, hard miles. Thanks, Greg." Which we actually kind of talked a little bit about.

HUNTER: Yep. So Greg, one of the key parts of Ironman Wisconsin is the fact that the hills are relentless. You have to prepare for the hills. You have to make a pacing...One key component of learning and doing well at Ironman Wisconsin is judging how long the hills are by looking at them. If you don't live near there and you can't pre-ride, no problem. Hopefully you do live in an area where there are some hills. I'll tell you what I'd do, I'd go out on a route, I'd go out on a loop and at the bottom of each hill say to yourself, "That's a minute and a half hill. That's a 2 minute and 30 second hill. That's a 47 second hill." Just play some games. Then time your hills. Watch your stopwatch. Put a stopwatch on your handlebars for easy hitting it and then go up the hills and see how close you are to figuring out how long the hills are.

The reason that is, is because when you get out there in Ironman Wisconsin you've got all these hills and you need to be able to look at that hill and you need to say, "That's a two-minute hill. Okay, with a two-minute hill my pacing guideline is I can only be at 105 percent of my threshold power." Once you can sight the hills and you can see how long they are, then you come back to your pacing guideline. That's key. All of a sudden it's like, "Oh wow. Here's how I'm doing. I'm getting ready for this hill."

The other key part of training for Ironman Wisconsin is you're going to have to do anaerobic capacity work. It's the one Ironman out there that demands anaerobic capacity. Anaerobic capacity is the ability to go hard for 30 seconds to 2 minutes and recover quickly. Most Ironmans you don't have to do that for because you never have these really harsh, short efforts. Ironman Wisconsin, you do. So you do have to do 2-minute repeats, minute repeats, minute and a half repeats, 30 second repeats. You have to train your anaerobic capacity, along with your tempo pace, your threshold pace. Those are key. That's a couple of key tips for you there Greg.

KERRY: Cool. Awesome stuff. We've got Tula from New Jersey. Wants to know, "I am a runner and new to cycling, preparing for my first triathlon sprint. What key advice would you give me or anyone on starting out?"

HUNTER: When you make the transition from running into cycling, the biggest thing that you can do besides just getting the technical aspects of riding your bicycle dialed in, the biggest thing that you can do is, again, coming back to this idea of how hard can I go and still run? So you know how hard you

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can go when you're running and you know how to pace yourself running. But how do you pace yourself on the bike and then still run?

For runners coming into the sport, they tend to be cardiovascular fit so they need to improve some of their cycling muscles. Then the next thing they really need to do is they need to do a lot of bricks. Go out and do 30 miles on your bike as hard as you can. Get off, run a 10K. See if you can do it. See if it's even possible. See if you can pace yourself well enough to do it. If you can't run, you know that you went too hard on the bike. So pacing is a critical component. If you have a power meter then that helps you even further kind of figure out the pacing strategy for it.

In my book, "Training and Racing with a Power Meter," I have a section on the paces, the percent of threshold you should hold for certain distances in the Ironman, or Half-Ironman, or any big distance. So if you're thinking about a power meter, that might be a good reference for you as well.

KERRY: Good deal. Bill from Calgary asks, "If you're already on Training Peaks, how would WKO help the average athlete?"

HUNTER: So if you're already using Training Peaks, the online version, and logging your data or uploading your nutrition or uploading your power files, WKO is kind of the premier power analysis software. What it really does is it helps you to better analyze the individual file. So that file and how many intervals you did, were you in the right zone and how much percentage of drop-off of power you had from one to another, those types of things. Then also looking at it from that bigger perspective and looking at it from a place of, "Is my five-minute power really improving?" And seeing what we call mean-maximal power - mean being average, maximal being best - mean-maximal power over time. So looking at it over time is critical. Then lastly, back to the old Performance Manager chart there, looking at it and saying, "Where is my training stress balance? Where is my fitness right now? My chronic training load? What is that?" And thinking about it from that perspective. Those things make a big difference and really kind of take it to the next level.

KERRY: All right. Then we've got Richard in Sweetwater and he wants to know, "How would I adjust WKO for my age of 44?"

HUNTER: Okay. In WKO the one thing that you need to probably adjust is the Performance Manager Chart itself. There is a setting, if you go on the Performance Manager Chart, under 'options' and then 'customize this chart.' Then under that there is a little setting in there called ATL. So ATL constant needs to be changed. The default is at seven days, so there's a number seven there for ATL. Then you're going to change that number down, if you think you recover faster than normal, than your peers, or you

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lengthen it a little bit. You might want to put it out at nine days. At 44, it depends on how long you've been training. If you've been training for a long time then seven might not be too bad. It might be dead-on. If you're new to endurance sports you might move it out to nine until you get your recovery system online, so to speak. Something like that. So 'option' 'customize this chart' and then the ATL constant. ATL stands for acute training load. It tells us how quickly we recover from a short, hard effort. So that's it.

KERRY: Awesome. Well, I think that's it. Hunter, where can people get your stuff again?

HUNTER: Sure. A lot of articles, my coaching, I've got a bunch of coaches that help me out, PeaksCoachingGroup.com. Again, I do webinars all the time, once a month. I even have past webinars on here too. So if this intrigues you and you're thinking about it, you can go to PeaksCoachingGroup.com, click on webinars. I've got all these past webinars you can buy, download, watch them on-demand, just like DirectTV. [Laughs]

KERRY: Good deal.

HUNTER: Buy them from your home. Then TrainingPeaks.com is where our software is. WKO Plus is our software. So go check that out and then get a copy of my book, "Training and Racing with a Power Meter." I'll send you an autographed copy if you buy it right off the PeaksCoachingGroup.com.

KERRY: Great. Hunter, thank you so much for coming on and sharing all your knowledge with us tonight.

HUNTER: Oh, Kerry, great to be a part of this. Thanks a lot. It's an honor to be here and I'm glad to do it.

KERRY: Awesome. Well everyone, that is the end of tonight's call. We will see you next week. That's basically it. Everyone, have a good night. Bye.