

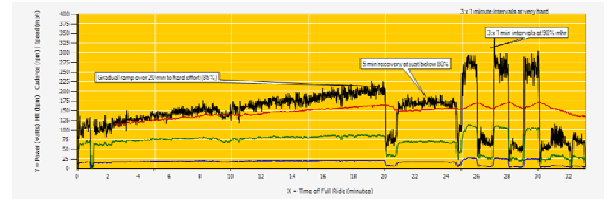
How Do You Stack Up?©

By Sally Edwards, MA, MBA
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If you are an early adopter of a power meter you have already discovered that the tool helps you to perform better. Better than you, yourself, performed previously. And, yes, better than your un-tooled training partners, because you have a power meter, and they don't. But, do you perform better than other riders who are using a power meter, like you?

There you are, riding with your team or your cycling group. You've got a power-equipped dashboard on your bike, and you're looking at the data that is displayed on the console. You want to ask to your riding partners,

“What's your power right now?”, but unless they, too, have equipped their bikes with power meters, they don't know their power output, and you can't make a comparison.



So you head for information from the web, this article, or a bike shop. And you ask, “How do your numbers stack up with mine?” And, “How do those numbers compare with others in our age group or fitness or racing level?” And, not too surprisingly, even most riders who are using power meters can't really answer those questions. They can give you their raw numbers, like they may know that on a good day they climb a given hill at about 90% of their threshold heart rate and at about 220 watts, taking about 3 minutes to reach the top at 12 mph, and that on a bad day they can't hold that.

Still, what's left unresolved is the answer to the question – how does your data compare with other riders? Or, the underlying question, how strong a rider are you compared to the field? Even I can't answer that question for you, yet, as there's just not enough data out there. But there will be.

In the meantime, let's look at how you stack up with six professional cyclists¹, all males. While I don't generally recommend that you compare yourself with the best in the sport, it will give you an idea of the spectrum of power we're talking about here. Just remember that, because they are pros, your data will be quite different than theirs.

Recently, exercise scientist completed the first study ever that evaluated the workload sustained by professional elite road cyclists during a multistage race using direct power measurements. For background information, please note that these guys are riding 1,750 miles per month or averaging about 50-60 miles a day in training. They are all members of the same team and each competed in at least one of the three major European tours: Tour de France, Giro d'Italia, or Vuelta a Espana. And, yes, they are some of the best cyclists in the world.

The researchers measured the cyclists' power and heart rate during the six stages of a road race that included a mean uphill time trial. Here's what they found out:

334-29¹ Vogt, S., Heinrich, L. et.al. “Power Output during Stage Racing in Professional Road Cycling,” Medicine and Science in Sports and Exercise, January, 2006. Volume 38:1 pp 147-151.

Road Race Averages for Six Professional Cyclists

Age	27.3 years
Maximum power output (peak watts)	390 watts
Maximum power output per kilogram body weight (peak watts per kg body weight)	5.5 watts
Watts at threshold ²	248 watts
Heart rate at threshold	137 bpm

Now you can compare your riding data with some of the best in the world. Unless, you, too, are one of the best in the world, just don't take the comparison too seriously.

Next, and more appropriately, how do you compare with others that might be more of your class of rider? We don't have data that's as specific for this next table; for example, what would be better is to compare watts per kilogram of body weight, to equalize the power output. For now, though, you can just use total watts as a benchmark to your standing.

Peak Power for Time Period ** (watts)					
Males*	2 hours	1 hour	30 min	5 minutes	30 seconds
Fit guy	147-170	172-192	194-206	213-239	452-565
Category 4 Rider	182-209	212-237	240-254	266-293	559-698
Domestic Pro	252-291	295-330	334-353	372-404	777-971
International Pro	275-317	321-359	364-388	394-452	846-1057

*Note: I apologize that I cannot provide this table for females but I don't have that data, yet. I'll score it – promise.

**Provided from Allen Lim, Ph. D.

You may have scored well compared to this group of riders. But if your numbers aren't on the table above—because you are a fitness enthusiast or new or returning to cycling—don't worry. These numbers can be the first step of a quest to reach them.

And gathering any numbers at all is the starting point for phase two of riding: gathering data and benchmarking. Now, whether it's on or off the chart, you've got that starting point. How do you stack up?

Sally Edwards

² Refresher from last month's article: The boundary in intensity between moderate and heavy efforts is called "the threshold."

Workout of the Month: Ride, Kathy, Ride ©

April 2007

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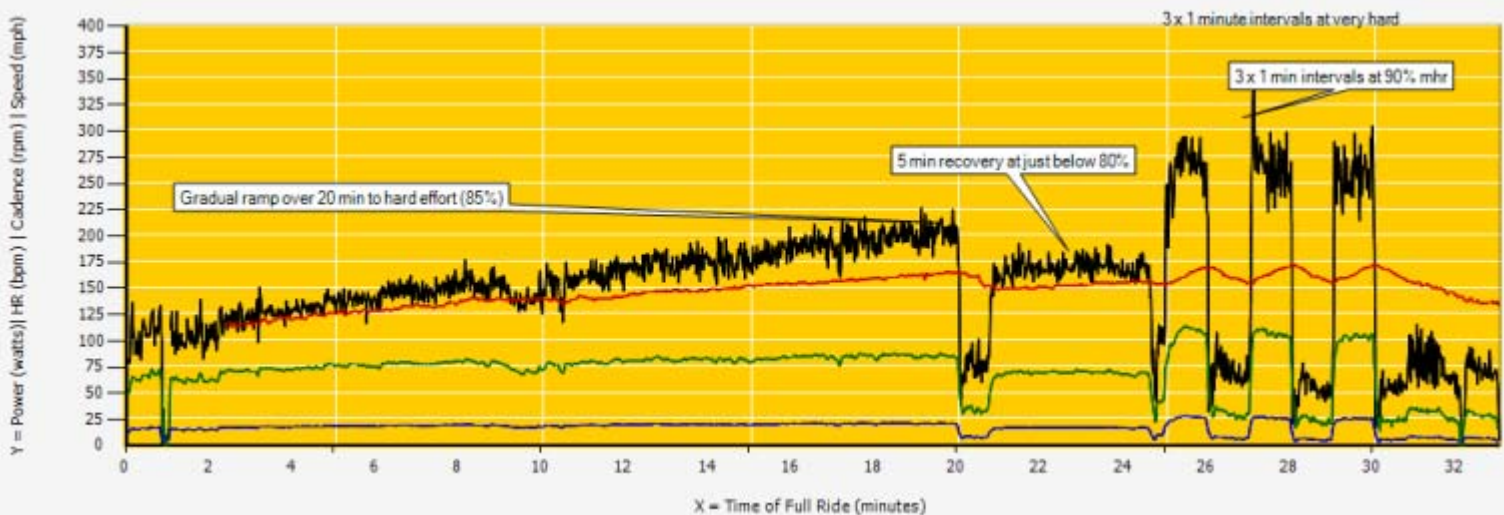
Description: Coupling occurs when any two similar data points are connected. Heart rate is an indirect response to exercise intensity. Power is a direct response to your effort, your exercise intensity. The two data points represented by bpm:watts normally respond in linear fashion, since, as force on the pedals increases¹, so does heart rate.

To test out that experience, “Ride, Kathy, Ride” couples these two responses together at different intensities to see if the two data points, watts and beats per minute stay coupled or not. Answer the question for yourself or see if your power and heart rate remain coupled or decouple at some point. If they do decouple, take note. Decoupling is a physiological landmark of serious importance.

Ride Format: This is a heart rate-driven workout, with power as the response. Start with an easy warm-up at 60% of maximum heart rate. Begin a slow 20-minute uphill by increasing resistance, to produce a heart rate increase of 2.5% every two minutes. Watch as your heart rate and power output float upward initially in direct relationship to each other.

When you hit 80%, take a recovery for five minutes and regroup as you prepare for high, hot, hard intervals. Begin them at minute 25, sprinting to 90% of maximum heart rate and holding for a total duration of 2 minutes, before you recover for one minute. This is tough to accomplish. This final part of the ride is not for the weak-at-heart. Complete three sets of 1 high, hot, hard interval followed by 1-minute active recovery. Cool down.

If you can download power and heart rate it should resemble the following profile. And, thanks to Kathy Kent for contributing this tough-red hot-finale-32-minute bpm:watts experience.



¹ with cadence or revolutions per minute of the pedals maintained

Ride, Kathy, Ride

Time (min)	Heart Rate (percent of maximum heart rate)	Description	Power Response (for Kathy Kent)	Your Power Response
0-1.9	60%	Warm-up. Go at an easy cadence and spin.	~100 watts	watts
2.0-19.9	60%-80%	Gradually increase resistance resulting in 0.25% increase in heart rate every 2 minutes to ~80%.	~100-200 watts	watts
20.0-24.9	70%-75%	Recover and mentally prepare.	~125 watts	watts
25-31	90%	Intervals: 1 minutes hard, 1 minute active recovery.	~275 peak watts	watts
31+	60%	Cool-down.	~100 watts	watts

Contributed by Kathy Kent, Heart Zones Red Level 5 Master Trainer.

Challenge: Kathy’s response in the “Ride, Kathy, Ride” workout shows that as she increases her effort, her heart rate and power in watts both respond directly. The two responses to ride effort stay coupled throughout the ride. This is normal unless fatigue or overexertion occurs, in which case power and heart rate decouple due in part to of dehydration and hyperthermia.

Have fun playing with the connection of these two interesting physiological benchmarks bpm:watts and see if they can stay friends throughout your ride by staying connected, by staying coupled.

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