

Is 'running power' a revolution  
in real-time analysis or just  
another data field to disregard?



# For it's worth

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unning is so popular because it's so accessible: grab a pair of half-decent trainers and away you go. Get bitten by the running bug, though, and as you progress from parkruns to longer distances, you'll soon discover a plethora of technology that promises to make you faster in pursuit of PBs.

A watch to track time is generally the first port of call when investing in tech, but most smartwatches or bands will also include access to a heart rate monitor, for zone-based drills and detailed post-run analysis.

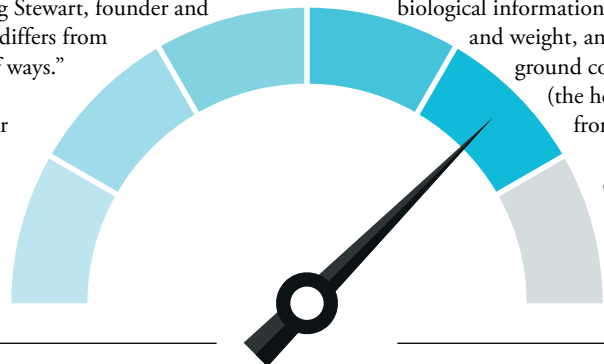
Over the last few years, another metric (and its accompanying tool) has started to make the leap to the mainstream. Added to Strava feeds in 2021 and unveiled in an update to certain Garmin smartwatches at the end of 2022, it comes with claims of real-time data that can not only transform your form and efficiency, but help you pace a race to perfection, too.

## Running meter

Cyclists will be familiar with the new measurement. Known as 'power', it's a way of calculating the amount of work that you're putting in. Displayed as watts – where one watt equals the amount of energy it takes to burn a Joule (1,000th of a kiloJoule) per second – it's essentially a recording of force.

"I think running power has come out of looking at the value that power has brought to how cyclists train and race over the last 15 to 20 years," says Doug Stewart, founder and running coach at TMR Coaching. "It differs from cycling power, though, in a number of ways."

In cycling, a power meter will be integrated into a pedal, crankset or rear wheel's hub, and will include a strain gauge that is able to measure the torque. Outside of a lab-based, treadmill setting, there isn't currently a strain gauge-based running power meter set-up. Instead, a running



power meter calculates an approximate output using biological information you've provided, such as height and weight, and data including your cadence, ground contact time and vertical oscillation (the height you rise and fall mid-stride) from built-in sensors.

"A cycling power meter can be calibrated and validated to 98% or 99% accuracy," explains Stewart. "With running power, it's trying to create this number, but it isn't actually measuring force – it doesn't



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have a plate underneath your foot to capture that. In theory, if you were to have three different power meters on your bike, they should all measure within a watt or two of one another in the range of their accepted validity. With running power, you could probably have three completely different numbers, because they're just based on calculations."

Stewart himself was an early adopter of the technology and uses a Stryd foot pod. The American manufacturer has conducted its own research and found that its equipment is able to estimate a force profile within 95% accuracy of a lab-standard treadmill.

## Zone in

Despite the slight guesstimation compared to modern cycling power meters, Stewart believes that running to power has a number of benefits over heart rate or pace. But before getting started, you need to work out your zones.

"First off, you have to determine your critical power, which is basically a threshold," he explains.

While some power meters will auto-calculate your critical power based on data from your workouts, it is possible to conduct your own test "where you run max effort for nine minutes and max effort for three minutes." From here, you can use an online calculator to set zones – from

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easy to sprint – that are based on a percentage of your critical power.

#### Knowledge is power

“If you’re training to heart rate or pace using a GPS watch, and you’re doing intervals, there is always a lag. The heart rate takes a long time to catch up with [hard] efforts; it may take 30 seconds before you hit that pace on your watch, even though you know you’ve been running it for [that long]. With the power, it’s as near real-time as you can get, so if you’re trying to run a certain power, it will be on your watch within a second or two.”

This live feedback can ensure you don’t go off too hard before fading and working at

the intensity a workout calls for, improving accuracy in the process. But its advantages aren’t limited to HIIT sessions.

“Another value from it is when going up and down hills,” adds Stewart. “If you were doing a pace-based workout, you would have to make sure you don’t have too many undulations, whereas if you’re using [power], it will respond very quickly to a gradient. If you’re meant to be running at 320W, and you start to climb, you may see you’re at 350 and know you can back off by that 10% and get back into the correct power target.”

Power can come into its own when racing, too. “A lot of the apps now have calculators you can use,” says Stewart. “If you know your critical power is ‘x’, they will then give you a target for running a marathon and an estimated time, and you can go with confidence and run to that.”

#### Understanding improvements

Post-workout, it’s possible to combine it with heart rate and pace-based data, to see improvements or signs that you need to make some interventions.

“With cycling power, all things being equal, if you increase your power output, your pace will be faster,” says Stewart. “With running power, if you can run faster for the same power output, it suggests that your running form has improved.”

“You can also see very clearly how your heart rate and pace are responding to power. Power responds to fatigue, so at an easy or endurance run effort, you should see the heart rate staying relatively flat. If it’s drifting away from the power output, it’s a very clear indicator that you need to look at elements such as fuelling.”

#### Straight torque

Stewart believes that “it could be beneficial for everyone”, but concedes it’s more for a serious runner who wants to do further analysis. “If you’ve got a GPS watch and a heart rate monitor, those two metrics are probably a good starting point for most people. But as you become more serious and you’re looking at doing a marathon PB, you’ve had a couple of near misses, then maybe a power meter would be the difference where it helps with your pacing and ensuring you’re training at the correct intensity.”

You don’t have to be focused on long distances to see a benefit when it comes to race day, but “pacing arguably could be more



## POWER DRILLS

Check out running coach Doug Stewart’s power-based training sessions...

### 1. Hill sprints

Find a steep hill where you can complete a 10-second, all-out effort and repeat with 30-second breaks between reps. “As long as it’s the same hill,” says Stewart, “you’ll see you’re producing more power and therefore going up the hill faster week after week.”

### 2. Float recoveries

For more threshold-focused efforts, such as over/unders – where you run an interval above your race pace before a recovery interval slightly slower than race pace – a power meter can ensure “you can hit your interval intensity and the recovery intensity really quickly.”

### 3. Form finder

Start running at a steady, easy pace on a relatively flat route, and make a note of your running power. You’re now going to try to keep that number consistent and up the pace using your technique alone. “You might just up your cadence a little bit,” says Stewart, “change your foot landing ever so slightly, alter your torso position or use your arms a little bit more or less and see how your running speed changes versus the power output. It can be a useful tool for people to work out what’s a more economical running form, according to the power output.”

important for a marathon runner than someone doing a shorter distance.” From his own experience, Stewart adds that it’s best for road or treadmill running.

“On the trails, if you start power hiking – so walking up the hills, which ultrarunners will do – the power numbers are disproportionately low to the effort and heart rate you’re putting in, so it doesn’t account for underfoot conditions,” he says.

Also, while power meters can account for things such as gradient, altitude and even wind, your running trainers can have an impact on your output:

“Carbon-plated shoes [cause] more height per strike and shorter ground contact time, which is what you would expect because they’re trying to spring you off the ground, so they may give a slightly different reading,” says Stewart. “However, if you’re wearing a carbon-plated shoe, chances are you’re looking at higher power outputs because you’re running faster.”

Plus, as there’s a good chance you will be saving these shoes for a key interval session or even race day itself, it shouldn’t skew your day-to-day training, but rather give you that power-based boost when you need it most.



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**Tour de force**

While it’s still relatively early days in the running power meter race, the fact that it’s being integrated into apps such as Strava and championed by Garmin shows it’s only going to become more prevalent. Although the lack of a unifying way of calculating output shows

it’s still going through teething problems, its benefits over the rather primitive pace- and heart rate-based training methods are clear. Throw in the ability to accurately pace any race and prevent hitting the dreaded wall, and a running power meter might just be the ultimate piece of training technology. 🏆

**POWER TOOLS**

Three of the best power-measuring devices on the market

**Stryd Foot Pod**

From £219, [stryd.com](http://stryd.com)

The foot pod-based power meter clips onto your shoe’s laces and features sensors that can account for everything from altitude to wind. Compatible with all major smartwatches, its sensors can also upgrade a GPS-based watch’s accuracy, while its optional membership package provides tailored training plans.



**Garmin Running Dynamics Pod**

£59.99, [garmin.com](http://garmin.com)

The cheapest way to add power to your training, this pod clips to the back of your shorts and calculates a suite of stats, such as ground contact time and stride length, using its built-in accelerometer. Check its compatibility before buying, though, as it only works with certain Garmin smartwatches.



**Garmin HRM Pro Plus**

£119.99, [garmin.com](http://garmin.com)

This builds the running analysis features of Garmin’s Dynamics Pod into a chest-worn heart rate monitor strap. The power feature is only compatible with Garmin devices for now, but it has better compatibility than the Dynamics Pod, plus it’s waterproof, making it a wise choice for multi-sport athletes.



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