



# Put your fitness to the test

WE FREQUENTLY TALK ABOUT THE BENEFITS of proper sports testing and the gains to be had from taking a holistic approach to your cycling development on the pages of Fitness. But what benefits does this kind of approach to training actually get you? *Daniel Duguid* finds out

**A**s an elite mountain biker, but only a second cat on the road, I intended to do more road racing. But I was aware that the demands of the two disciplines may be quite different, and to improve as a road racer I had to work on particular areas of my fitness.

Simon Harling and Rob Ahmun, of Elite Fitness in Cardiff, conducted two tests on my first visit. The max test was definitely one of the hardest things I have ever done. Starting off easy and gradually getting harder and harder, it's a battle of your mind and body. It is very rare that you are pushed to absolute exhaustion within such a short time, but I was.

The first test performed was a ramp test, to establish individual VO2 max and blood lactate profile. The second was a time-to-exhaustion test, where you pedal at your maximum power output for as long as possible. This helps to establish your anaerobic capacity — or your ability in high-intensity sprint work.

Riding at max to exhaustion, along with a warm-up, is a real

battle and the lactate levels rise very quickly. The immediate stress on my body was incredible, and it is hard to replicate even when racing: so what does the ramp test actually do?

"The standard ramp test gives you all the basic information you need — anaerobic and lactate thresholds, peak power output and heart rate," explains Simon Harling of Elite Fitness. "Together with the time-to-exhaustion test results, this then allows us to create an individual training programme based around what kind of cycling event you do and where your weaknesses lie.

"From these results we discovered that Dan needed to increase his power output. His time-to-exhaustion at peak power output wasn't brilliant either."

In other words, I needed to increase my ability to tolerate high levels of lactate. My strengths were endurance and climbing. I didn't have immense power, but because I'm light, my strength-to-weight ratio was good. The test highlighted my weaknesses — sprinting and sustained high-level efforts.

## INTERVENTION

"Dan could sit on a bike and pedal forever," says Harling, "but when he had to drop the hammer there was no hammer to drop, so to speak. We had him doing what amounts to resistance training work on the bike."

A programme of high-intensity sprint intervals with similar work and rest periods was set. "These sessions are not to be taken lightly," stresses Harling. "They are only once a week due to the high level of fatigue they cause."

Interestingly, sessions of this kind are 100 per cent backed up by hard science, proving their effectiveness in both short and medium distance (20-40 kilometre) endurance events. Sessions this hard are best done on the turbo, but it requires a large dose of determination to do them.

Turbo training is everyone's pet hate, so to get on the turbo and do short hard efforts was quite hard. I only did them once a week, but as they are such hard sessions it was probably all I needed to do.

The other sessions prescribed by the boys at Elite Fitness focused on lactate tolerance and improving power output and speed during sustained efforts.

## WITNESS THE FITNESS

A re-test three months later clearly show the improvements gained. My power output and my VO2 max have gone up (see table), not by a considerable amount, but considering that I am in the race season and I haven't been doing all the power turbo sessions I should be, I am very pleased. The long intervals — 20-minute sustained efforts — have improved my cycling efficiency. My body has got used



Fitness tests: pushing your limits

to churning along at high power outputs and I am more able to clear lactate build-up.

By increasing my VO2 max, power output and my cycling efficiency at all levels of power output, I will have improved my race pace.

"In a 20-kilometre time trial, for example, Dan could now get round significantly quicker or, if he did do the same time, he'd hardly break a sweat. For a lower level of effort he can go equally as fast," Harling says.

Seeing the improvements from a re-test is a strong motivator, as is having a training programme you trust. I feel more confident with what I'm doing. I can feel the changes in my body from what

I've been doing. The training Ahmun and Harling have set me has been really effective — I can feel myself sprinting better and getting stronger.

Because I know what I'm doing, and the effects I get, I actually want to do it. If you just ride your bike it doesn't get you as fit as having a structured programme, which makes you do what you need to do, not what you want to do. I found the test gave me motivation because I now understand what's going on in my body. I feel like I'm training to achieve something.

Harling agrees: "These are very typical of the kind of results we'd expect from an already highly-trained athlete."

The magnitude of the improvement is directly related to the training status of the individual — the more highly trained you are, the less of an improvement you are going to see compared to a relatively untrained person.

"For example, one client of Elite Fitness has dropped almost 10 kilograms in body weight and 29 minutes from a 20-mile time trial," says Harling.

"We know we can improve people's fitness but we are never sure about their adherence to the exercise programme, so we are loath to predict it. Regular re-testing is advised to ensure the exercise intensities are accurate, because if you improve as dramatically as some of our clients your 'old' exercise prescription will be inaccurate."

## HOLISTIC APPROACH

My improvements aren't just from fitness training, but from a combination of fitness training and physiotherapy I have received from Jo Elphinston, also at Elite Fitness.

With several specialists conducting clinics at their Cardiff base, Elite Fitness videoed me on my bike and it became apparent there were some biomechanical issues to be addressed, so I was referred to physiotherapist Jo Elphinston.

After the first consultation with Jo it was apparent that I had some major differences in the symmetry of my body on and off the bike. I have always had back problems, but after a discussion of previous injuries and operations, it was identified that it was actually my ankle that was causing the problem.

By stabilising myself with my ankle, I was not utilising my glutes and instead I was locking

## WHERE TO GET TESTED ELITE FITNESS

Unit 2, Fairwater Industrial Estate, Norbury Road, Cardiff CF5 3AU, telephone 029 2055 5272, or visit [www.elitefitness.co.uk](http://www.elitefitness.co.uk). There is a 10 per cent discount for *Cycling Weekly* readers on their first sports test. Starting price £85.



Elite's physiotherapist Jo Elphinston gets to work on Dan's biomechanics

the sacroiliac joints in my back for stability.

With a series of exercises to activate the muscles with my own body weight, I was able to get my glutes working to relieve pressures on my back and create a better symmetry of both sides of my body while cycling.

While the exercises were benefiting my riding, the initial routine of doing them before riding was difficult, as I suffer from the syndrome of thinking that: 'just riding my bike is going to make me a better rider'.

It was important to perform the exercises correctly so that the right muscles were being used and I was not reverting back to the old incorrect muscle patterns.

After a few exercise sessions, the muscles were becoming active again so that I could feel them when riding. My glutes were now

working again, whereas before they weren't, and that had actually been a contributing factor to a lack of power.

Now that my body symmetry is back on track and my body is working more like it should do, I'm going to be adding some weights and some new interval sessions. I'll be doing some really high-end max power intervals to replicate racing.

"The work Dan and Jo did to improve his cycling position and muscle patterning played a critical part in his performance gains," stresses Ahmun. "An integrated approach is always the ideal situation — although it's hard to separate out where the performance improvements actually came from, as both are geared towards improving cycling power and speed, and therefore go hand-in-hand."



A detailed physical check-up helps get to the bottom of riding problems

MEASURE OF FITNESS	FEBRUARY 2005	MAY 2005	PERCENTAGE CHANGES
Maximal Oxygen Consumption (VO2 max)	68 ml·kg·min <sup>-1</sup>	72 ml·kg·min <sup>-1</sup>	6%
Peak Power Output	390 Watt	420 Watt	7%
Heart Rate @ 240W	154 bpm	136 bpm	11%
Heart Rate @ 300W	177 bpm	158 bpm	11%
Blood Lactate @ 240W	1.6 mmol·L <sup>-1</sup>	0.7 mmol·L <sup>-1</sup>	56%
Blood Lactate @ 300W	3.0 mmol·L <sup>-1</sup>	2.2 mmol·L <sup>-1</sup>	26%
Volume of air consumed @ 240W	73 L · min <sup>-1</sup>	67 L · min <sup>-1</sup>	8%
Volume of air consumed @ 300W	118 L · min <sup>-1</sup>	95 L · min <sup>-1</sup>	19%
Oxygen Consumption @ 240W	3.2 L O <sub>2</sub> · min <sup>-1</sup>	2.9 L O <sub>2</sub> · min <sup>-1</sup>	9%
Oxygen Consumption @ 300W	3.9 L O <sub>2</sub> · min <sup>-1</sup>	3.6 L O <sub>2</sub> · min <sup>-1</sup>	8%