

Breathe deep, ride easy

Chris Sidwells looks at a way to add extra power to your cycling by taking a few deep breaths a day.

We train our legs, we train our core muscles, even our upper body, but we tend to take the muscles that power our breathing for granted. It's natural really; cycling makes you out of breath so it works the muscles that work our lungs. That should be enough, shouldn't it? Well, not quite. Up to a certain level your breathing muscles get stronger as you get fitter, but when you are fit enough to push really hard and your breathing becomes laboured, the act of doing so has the potential to limit your progress.

It's due to something called the metaboreflex. When your brain registers you are struggling to breathe it diverts oxygen from your peripheral muscles, in your legs for example, to your breathing muscles. If this happens when you are cycling it means that you might be sucking in all the oxygen you need to keep riding hard, but your brain won't send it to your legs, where it's needed most.

In a paper, Douglas R Seals of the Department of Kinesiology and Applied Physiology at the University of Colorado calls the metaboreflex: "Robin Hood for the lungs because it steals blood flow from locomotor muscles."

CATCH 22

Allison McConnell, who wrote the bible on breathing for endurance sports, *Breathe Strong Perform Better*, realised that the metaboreflex put endurance athletes in a catch 22 situation. Breathing muscles couldn't be conditioned to handle heavier loads because the metaboreflex worked against being able to exercise at a sufficient intensity to overload them.

McConnell thought if the breathing muscles could be isolated and loaded independently, i.e. without doing any other form of exercise, they could be made stronger. This would enable higher exercise intensities to be reached and create a greater exercise load,

and therefore a greater stimulus to improve for the whole body.

Her thinking followed the lines of classic weight training — if you isolate a muscle or group of muscles and overload them, they get stronger. She invented the Powerbreathe, a breathing muscle training system which isolates and loads breathing muscles without any other exercise.

HOW IT WORKS

Basically the device, which has been fine-tuned and developed since its inception, involves exhaling fully then breathing in through a mouthpiece against resistance. You do a certain number of repetitions — 30 breaths twice a day is the basic recommended programme — and the load can be increased as your muscles strengthen.

O'Connell's book lists many studies, but the most striking is a study where the subjects' cycling performance improved just as much by only adding two daily sets of 30 Powerbreathe breaths to their training as it did by adding special intervals. The exercises also took half the time of the intervals.

Powerbreathe is marketed by HaB International Ltd, and its sales director Duncan Kerr told us, "We do three basic models, green, blue and red. They all have different loading curves; for example the red ramps up very quickly and is

A COACH'S PERSPECTIVE

Jon Sharples owns Trainsharp and coaches a lot of cyclists. He's a big advocate of Powerbreathe, especially in one area we haven't touched on yet: "As well as using a Powerbreathe as part of the strength and conditioning routine, I encourage my clients to use them during their warm-up for racing and training. "You warm up to get your muscles ready for action, but often when people race, especially early in the season, they get stitches or restricted breathing. It's because the effort has shocked their muscles. If you do some deep breathing on the Powerbreathe, the resistance taxes your muscle and prepares them for the effort to come.

designed for big rugby players, whereas the blue works best for endurance athletes like cyclists. The devices can be used to strengthen and condition your breathing muscles, and for warm-ups to prepare the muscles for exercise, or cool-downs, where using a Powerbreathe helps process lactic acid."

The Powerbreathe K1 to K5 models are more sophisticated. They have electronic rather than mechanically controlled resistance. The K5 can even be linked to a laptop so you can watch your lungs work and get quantitative feedback.

"The feedback helps your brain make new connections with your breathing muscles, just by seeing the numbers. For example, when

THE BREATHING BIBLE

Allison McConnell's book explains everything you need to know, everything there is to know in fact, about breathing during exercise. It starts by explaining how you breathe, how you should breathe to do so efficiently, and stresses the importance of conditioning your breathing muscles. At first that's done independently to the rest of your training but later in the book it shows how to do specific drills across a range of sports while using the Powerbreathe.

The book also explains how important your core muscles are in breathing and the role breathing muscles play in core stability, and how strong and well-conditioned breathing muscles make less overall oxygen demands, which releases oxygen to power your legs.

We'd certainly recommend using a Powerbreathe. One of the big factors in Bradley Wiggins's Tour de France win was all the time he spent training at altitude, and one of the most important effects of altitude training is strengthening the breathing muscles and teaching your body to breathe more efficiently. Powerbreathe can do that, and if you buy the device Alison McConnell's book will ensure your investment pays back in full.



I started using a K5 I scored 4.2 litres but by focusing on getting to five litres, and concentrating on the muscles to do it while I used the Powerbreathe, I got to 5.3. I also increased my volume rate," Kerr says.

That improvement can be equated to pedalling; to increase your pedalling power you must improve the force you can apply per pedal stroke and increase the stroke rate, so that the increased force is being applied more often per minute.

BIG BREATHS

Essentially, your breathing muscles are split into inspiratory and expiratory. The inspiratory are the intercostals, which articulate your rib cage and so allow your lungs to expand, and the diaphragm that controls the volume of your chest cavity. The diaphragm is a domed sheet of muscle at the base of your lungs. When it contracts it flattens and so creates a pressure difference inside your lungs and air rushes in to fill them, causing them to expand. The intercostals also play a part in allowing this expansion by lifting your rib cage upwards and outwards.

Your expiratory muscles are those of the muscular corset of the abdominal wall and are also involved in core strength. The intercostals also play a part in expiration, and they too are involved in core strength. So that's the best way to think of using a Powerbreathe, as part of the strength and conditioning of your core.

■ Powerbreathe is available from www.wiggle.co.uk

