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Better Breathing

It's unlikely you'll be able to make your lungs larger, but there are ways to make the muscles that control your breathing function more effectively

Triathlon training involves strengthening your arms for swimming, your legs for cycling and running, and your core for stability for all three. After that, the natural assumption is to start looking elsewhere – such as technology and nutrition – for ways to improve your performance.

But what about your breathing? It's easy to assume that, as an involuntary action, your body is naturally doing it to the best of its ability. However, it's your external intercostal muscles and your diaphragm that control your breathing action, and as such you can train them to optimise their operation.

Inspiratory muscle training (IMT) is gaining popular support – not just for triathlon, but as a means of improving your general health and well-being in everyday life. It's a daily regime whereby you practise breathing through a device that provides adjustable resistance against your inhaling and exhaling.

The programme usually involves taking 30 breaths with the device, twice a day, for several weeks. You can then increase the resistance as you become more accustomed to breathing against it. But is there any evidence to prove it can benefit your breathing?

Breathing benefits

Suppose you're riding up a climb. There's another competitor nearby that you want to drop, so you increase your effort to build a gap. The effort required to climb faster means your breathing gets harder. But the harder breathing itself requires extra energy – your respiratory muscles could be using up to 15% more oxygen than usual to power their activity.

However, if you increase those muscles' strength, they'll be more efficient and will be able to handle harder efforts while using less energy, meaning more energy can go to your leg muscles to keep you turning the pedals over.

Much of the research into IMT has been conducted in the UK where the inventors of the Powerbreathe – an IMT device – are based. Early work found that an improvement of 2-5% could be gained from 2-3 months of IMT [1, 2].

More recent studies carried out by the School of Applied Science at the University of Glamorgan have found:

■ A 10-week IMT programme improved respiratory muscle endurance and diaphragm thickness [3].

■ An IMT programme improved cycling performance at 75% $\dot{V}O_{2max}$ by 36% [3].



■ Just six weeks of IMT improved heart rate (HR) response and perceived exertion to a standard exercise effort [4].

The following reports show significant benefits that have been enjoyed by groups elsewhere who have carried out different work. Some studies used conventional exercises as an alternative to an IMT device. A US-based team found a 12% improvement in respiratory capacity and, more importantly, a 4.7% improvement in a cycling time trial designed to last approx 40mins. And all this was after only a month of doing breathing exercises [5].

Another group used bicycle curls and sit-ups with progressive resistances and increased the number of efforts over a 16-week period. This was also shown to increase diaphragm thickness by 28%, maximum inspiratory pressure by 27% and maximum expiratory pressure by 38% [6]. However, by the end of the programme, test subjects were doing upwards of 100-150 sit-ups and lifting close to 35lb dumbbells four times a week. That takes considerably more time and effort than 30 twice-daily breathing exercises.

There is clearly a significant amount of evidence building up to support the idea that respiratory muscles can be trained to improve performance. IMT devices are relatively cheap, suffer minimal wear and tear, and are easily included into your daily routine. It's a legal ergogenic that's available and applicable to almost every athlete.

Don't stop breathing

Research into IMTs in a clinical environment – for patients suffering with pulmonary dysfunction – supports the concept that surrounds all

training: use it or lose it [7]. In other words, the training effect only lasts as long as training is continued. The effects start to fade once you stop training and the same is true for IMT. You could use a three-month IMT regime as part of your build-up to a big event. It would also be helpful to improve your lung function if you suffer from hay fever, or when the gym work that's helping to strengthen your lungs decreases for whatever reason.

IMT shares the same principles as any other training, namely: progression. You have to gradually increase the resistance load as you become accustomed to working against it. It's these increases that keep you improving; without them your progression will stall. And turning the resistance dial on a Powerbreathe is certainly easier than keeping count of 150 sit-ups or remembering when to increase the weight of your dumbbells. ■

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