

Inspiratory muscle training and endurance sport performance

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An Indiana University study found that strengthening inspiratory muscles by performing daily breathing exercises for six weeks significantly reduced the amount of oxygen these same breathing muscles required during exercise, possibly making more oxygen available for other muscles.

Louise Turner, a researcher in the Department of Kinesiology, said just the act of [breathing](#) during an endurance activity, such as running, swimming or cycling performed at maximum intensity, can account for 10 to 15 percent of an athlete's total [oxygen consumption](#). While inspiratory [muscle](#) training (IMT) has been shown to improve performance in endurance sports, Turner's study sought to shed light on how IMT does this.

"This study helps to provide further insight into the potential mechanisms responsible for the improved whole-body [endurance performance](#) previously reported following IMT," she said.

About the study:

- The double blind, placebo-controlled study involved 16 male [cyclists](#) ages 18 to 40.
- IMT involves the use of a hand-held device that provides resistance as one inhales through it, requiring greater use of

inspiratory muscles. For half of the study participants, the IMT device was set to a level that provided resistance as the subjects took a fast forceful breath in. For six weeks they took 30 breaths at this setting twice a day. The cyclists in the control group did the same exercises with the IMT adjusted to a minimal level.

- After six weeks, when the study participants mimicked the breathing required for low, moderate and maximum intensity activities, the inspiratory muscles required around 1 percent less [oxygen](#) during the low intensity exercise and required 3 to 4 percent less during the high intensity exercise.

Muscles need oxygen to produce energy. Turner's research also is looking at the next component of this equation, whether more oxygen is actually available to other muscles, particularly those in the legs, because less oxygen is being used by the breathing muscles.

IMT has been used as an intervention in pulmonary diseases and conditions, such as asthma, COPD and cystic fibrosis, and also is marketed as a means for improving athletic performance in cyclists, runners and swimmers.

Provided by Indiana University

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