

*Included are the full-length peer reviewed medical research papers. For your convenience, we have also included short summaries of each article with quotes taken directly from the corresponding research study.*

## IHT MAY HELP MANAGE VARIOUS MEDICAL CONDITIONS

### Alzheimer's/Neurodegenerative Diseases

#### **Adaptation to Intermittent Hypoxia Restricts Nitric Oxide Overproduction and Prevents Beta-Amyloid Toxicity in Rat Brain**

*Anna Goryacheva, Sergey Kruglov, Maya Pshennikova, Boris Smirin, Igor Malyshev, Igor Barskov, Illya Viktorov, Fred Downy, Eugenia Manukhina*

Summary: "Adaptation to intermittent hypoxia (AHI) affords significant protection against experimental Alzheimer's disease, and this protection correlates with restricted nitric oxide overproduction."

### Bronchial Asthma

#### **Intermittent Hypoxia: Mechanisms of Action and Some Applications to Bronchial Asthma Treatment**

*TV Serebrovskaya, RJ Swanson, EE Kolesnikova*

Summary: "IHT caused significant improvements in respiration, oxygen utilization, oxygen transport through the air-blood barrier, the feeling of well-being, and it diminished chronic bronchitis symptoms. These and many other data strongly suggest the effectiveness of IHT in industrial health care."

"In conclusion, hypoxic training represents a promising field of study in prevention and treatment of many diseases."

#### **Does Interval Hypoxic Training Affect the Lung Function of Asthmatic Athletes?**

*Charlotte Harrison, Jenny Fleming, Lynn Giles*

Summary: "This study demonstrated a statistically significant increase in FVC after IHT in both asthmatic and non-asthmatic participants... Some asthmatics showed an improvement in symptoms and a reduction in medication use."

"Comments by asthmatics in this study included less shortness of breath, not having such a tight chest, not as wheezy... This area may be worthy of further investigation to quantify the possible benefits of IHT to reducing medication for asthmatics."

## INTERMITTENT HYPOXIC THERAPY AS AN ADJUNCT TREATMENT FOR OBESITY

#### **Influences of Normobaric Hypoxia Training on Physical Fitness and Metabolic Risk Markers in Overweight to Obese Subjects**

*Susanne Wiesner, Sven Haufe, Stefan Engeli, Harry Mutschler, Ute Haas, Friedrich Luft, and Jens Jordan*

Summary: "We conclude that in obese subjects, training in hypoxia elicits a similar or even better response in terms of physical fitness, metabolic risk markers, and body composition at a lower workload. The fact that workload and, therefore, mechanic strain can be reduced in hypoxia could be particularly beneficial in obese patients with orthopedic comorbidities."

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## Usefulness of Combining Intermittent Hypoxia and Physical Exercise in the Treatment of Obesity

*A Urdampilleta, P Gonzalez-Muniesa, MP Portillo, and JA Martinez*

Summary: “The hypoxic stimulus in addition to diet and exercise can be an interesting approach to lose weight, by inducing higher basal noradrenalin levels and other metabolic changes whose mechanisms are still unclear. Indeed, hypoxic situations increase the diameter of arterioles, produce peripheral vasodilatation and decrease arterial blood pressure.”

“These observations allow consideration of the hypothesis that intermittent hypoxia induces fat loss and may ameliorate cardiovascular health, which might be of interest for the treatment of obesity.”

## IHT CAN HELP OPTIMIZE ATHLETIC PERFORMANCE

### Effect of Intermittent Normobaric Hypoxic Exposure at Rest on Haematological, Physiological, and Performance Parameters in Multi-Sport Athletes

*Michael John Hamlin & John Hellemans*

Summary: “The aim of this study was to determine whether 3 weeks of intermittent normobaric hypoxic exposure at rest was able to elicit changes that would benefit multi-sport athletes.”

“The effect of intermittent hypoxic training on 3-km performance found in this study is link to be beneficial, which suggests non-elite multi-sport athletes should expect such training to enhance performance.”

“In conclusion, we have shown that intermittent normobaric hypoxia at rest at 5-min intervals for 90 min a day, 5 days a week for 3 weeks is sufficient to elicit significant and worthwhile improvements in 3-km performance in multi-sport athletes of mixed ability.”

### Intermittent Hypoxia Improves Endurance Performance and Submaximal Exercise Efficiency

*Keisho Katayama, Hiroshi Matsuo, Koji Ishida, Shigeo Mori, and Miharuru Miyamura*

Summary: “The purpose of this study was to elucidate the influence of intermittent hypobaric hypoxia at rest on endurance performance and cardiorespiratory and hematological adaptations in trained endurance athletes.”

“The results suggest that intermittent hypoxia at rest could improve endurance performance and submaximal exercise efficiency at sea level in trained endurance athletes, but these improvements are not maintained after the cessation of intermittent hypoxia for 3 weeks.”

### High-Intensity Kayak Performance After Adaptation to Intermittent Hypoxia

*Darrell Bonetti, Will Hopkins, and Andrew Kilding*

Summary: “Relative to control, at 3 days post-treatment the hypoxia group showed the following increases: peak power 6.8%, mean repeat sprint power 8.3%, and hemoglobin concentration 3.6%. Large effects for peak power and mean sprint speed were still present 10 days post-hypoxia.”

“The effects of intermittent hypoxic exposure should enhance performance in kayak racing. The effects might be mediated via changes in oxygen transport.”

## Sports Applications of IHT

Summary of IHT benefits in concise table, provided by GO2 Altitude website

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# INTERMITTENT HYPOXIC THERAPY MAY HELP PRE-ACCLIMATE TO HIGH ALTITUDE EXPOSURE

## Effects of Intermittent Hypoxic Training on Cycling Performance in Well-Trained Athlete

*Belle Roels, David Bentley, Olivier Coste, Jacques Mercier, Gregoire Millet*

Summary: “This study aimed to investigate the effects of a short-term period of intermittent hypoxic therapy (IHT) on cyclic performance in athletes.”

“In summary, 3 weeks of intermittent hypoxic training improved PPO measured in hypoxia in well-trained athletes. However, IHT was less efficient than similar normoxic training in terms of normoxic endurance performance. The data from this study suggests that the IHT model can be used for athletes preparing for competition at altitude.”