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## **Intermittent hypoxia training (IHT) in cardiology: Principles and practices**

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To the present days, IHT has been used extensively for altitude pre-acclimatization, in sport practice and for treatment of a variety of clinical disorders including coronary artery disease, arterial hypertension as well as a tool to prepare patients for coronary interventions. Meanwhile, many investigations are primarily focused on the detrimental effects of intermittent hypoxia associated with obstructive sleep apnea (OSA). The following questions arise: why do OSA and IHT produce such disparate effects on cardiovascular system; what are the key mechanisms determining the adaptive versus maladaptive nature of different hypoxic paradigms? An impressive amount of scientific information has been gathered, from the integrative systems level to the molecular and genomic level. But until now there is no exact evidence about the precise mechanism for switching adaptive or maladaptive responses to hypoxic impact. Nevertheless, basic investigations led to the introduction of various IHT methods in clinical practice, the development of different medical equipment, named hypoxicators, for its implementation. In particular, clinical data indicate that in patients with coronary artery disease IHT reduces daily myocardial ischemia, blood viscosity and platelet aggregation, increases hypoxic tolerance, improves endothelial function, normalizes systemic blood pressure etc. Recently, a new mode of adaptive training was explored, which combines periods of hypoxia and hyperoxia. A novel principle of short-term periodic adaptive training by varying the oxygen level from hypo- to hyperoxia is substantiated both theoretically and experimentally. We can envisage a bright future for individualized IHT, which may play a significant role in the fast developing field of personalized preventive medicine against cardiovascular diseases.

### **Biography**

Tatiana V. Serebrovskaya, Professor of Physiology, Doctor of Biology, Ph.D. Academician of Int. Acad. Sci., Principal researcher of the Bogomoletz Institute of Physiology, Kiev, Ukraine. She is the author of more than 300 scientific publications, including two monographs: Lei Xi & Tatiana V. Serebrovskaya (Eds) *Intermittent Hypoxia and Human Diseases* / Springer, UK, 2012, 316 pp and Lei Xi & Tatiana V. Serebrovskaya (Eds) *Intermittent Hypoxia: From Molecular Mechanisms to Clinical Applications* / Nova Science Publishers, NY 11788, 2009, 602 pp.

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