

Intermittent Hypoxic Training: A Review

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Intermittent Hypoxic Training (IHT) consists of exposure to alternating periods of hypoxia (9 - 14% O₂ inhaled through a mask) and reoxygenation with atmospheric air. 1, 2

The method originates in Russia where it has been studied extensively in the areas of aviation and clinical medicine. 1

Recently it has been applied in the field of athletic performance as an alternative to altitude training. 3

For the purpose of performance enhancement IHT sessions consist of six 5 minute periods of hypoxic air (9-10%) alternated with 5 minutes of exposure to atmospheric air. A full course consists of 1 or 2 sessions a day for 15 - 20 days.

Adaptations to IHT do not only include improvements in oxygen uptake, transport and utilisation but also in neuroendocrine regulation and immunity. 4,7

Kolchinskaye and others have done studies on rowers, swimmers, cyclists, kayakers, skiers, track and field athletes and volleyball players. 3

A course of IHT showed improvements in performance, VO₂ max, haematological values as well as decreased heart rates and pulmonary ventilation, compared to a

placebo group. Athletes involved in the studies also showed a lesser increase in arterial O₂ saturation during exercise and an improved lactate response.

Of interest is that volleyball players showed a significant improvement in the Vertical Jump test following IHT. One study showed a significant increase in resistance to high physical training loads measured by products related to activation of lipid peroxidation. 5

It is acknowledged that the adaptation process to IHT is not necessarily exactly the same as those obtained during altitude hypoxia and that additional adaptive processes might be responsible for some of the more pronounced effects of IHT. 6,7

Meerson describes the following advantages of IHT in comparison with continuous hypoxic exposure. 7:

1. Avoidance of chronic stress associated with continuous exposure to hypoxic air.
2. Control of the dose.
3. The absence of the disadaptation syndrome which athletes experience when returning to sea level following altitude training.
4. Increased activities of antioxidant enzymes in the brain, liver, heart and other organs. (In

contrast to suppression of antioxidant processes under chronic hypoxic stress)

To have an optimal effect IHT needs to be done in conjunction with physical training. Both types of training will expose the body to

hypoxic stress. The adaptive responses to hypoxic hypoxia (via IHT) and load hypoxia (via training) have a different mechanism but are complimentary. 8. Adaptive effects of training are enhanced by the adaptation to IHT. 9.