



ELITE
PERFORMANCE
CENTRE

PASSIONATE ABOUT PERFORMANCE



Intermittent Hypoxic Exposure (IHE)

HYP T's Intermittent Hypoxic Exposure Training Package is the newest of the altitude training protocols and has become widely used for health and wellness purposes. It involves short intermittent inhalations (3-5 minutes) of hypoxic air (9-10% O₂, 21000ft/6400m) interspersed with inhalations of ambient air (2-5 minutes).



Recovery



the arms and legs to the body core in a protective response, increasing blood flow to vital organs. This blood shift is similar to applying ice on an injury which produces the same peripheral vaso-restrictions.

During the hypoxic phase the peripheral cells become more receptive to oxygen as they scavenge what's available. When the period of breathing normal air commences vaso-dilation occurs and blood supply is restored.

Intermittent Hypoxic Exposure (IHE) is now being used by Physiotherapists to help injury recovery. Team GB Physiotherapist's have seen fantastic results on Grade 2 ankle injuries; the technique is now endorsed by the Australian Physiotherapy Association. With IHE no exercise is required, which is great if you are not able to bear weight on the injury. During the hypoxic intervals blood shifts from

At this point greater oxygen is delivered to these cells whilst they are in their receptive state and for a brief moment more oxygen is delivered than at ambient room conditions. The intermittent nature of this technique acts like a hot cold compress, swelling is visibly reduced. IHE is actually a universal training protocol and will prove valuable in any altitude training program.

Typically, these IHE sessions would be scheduled for the athlete's recovery day.





Hypoxic (HIIT) exercise sessions

We advise completing at least 2 hypoxic HIIT sessions per week, to improve athletic performance. These sessions are to be supplemented into your existing training schedule.

With the reduced oxygen levels muscle fatigue sets in, and is the main performance limiting factor. By working in Hypoxic environments athletes can effectively work harder at half the work load, When the human body is exposed to hypoxia (oxygen

reduced environments), it struggles to produce required amounts of energy with less available oxygen. This struggle triggers the onset of a range of physiological adaptations geared towards enhancing the efficiency of the body's respiratory, cardiovascular and oxygen utilization systems.

The result is a reduction in fatigue and the athlete will recover quicker, leading to increased intensity in training and physiological adaptation. Studies have proven significant increases in repeat sprint ability, increasing anabolic hormonal responses and increased red blood cell mass – all of which are enormously valuable across all contexts of sport.

Coupled with 5 sessions of IHE over 6 weeks, 15 HIIT training sessions will produce significant performance enhancements.



Providing gains of up to:

40%
INCREASE

**in Speed
Endurance**

20%
INCREASE

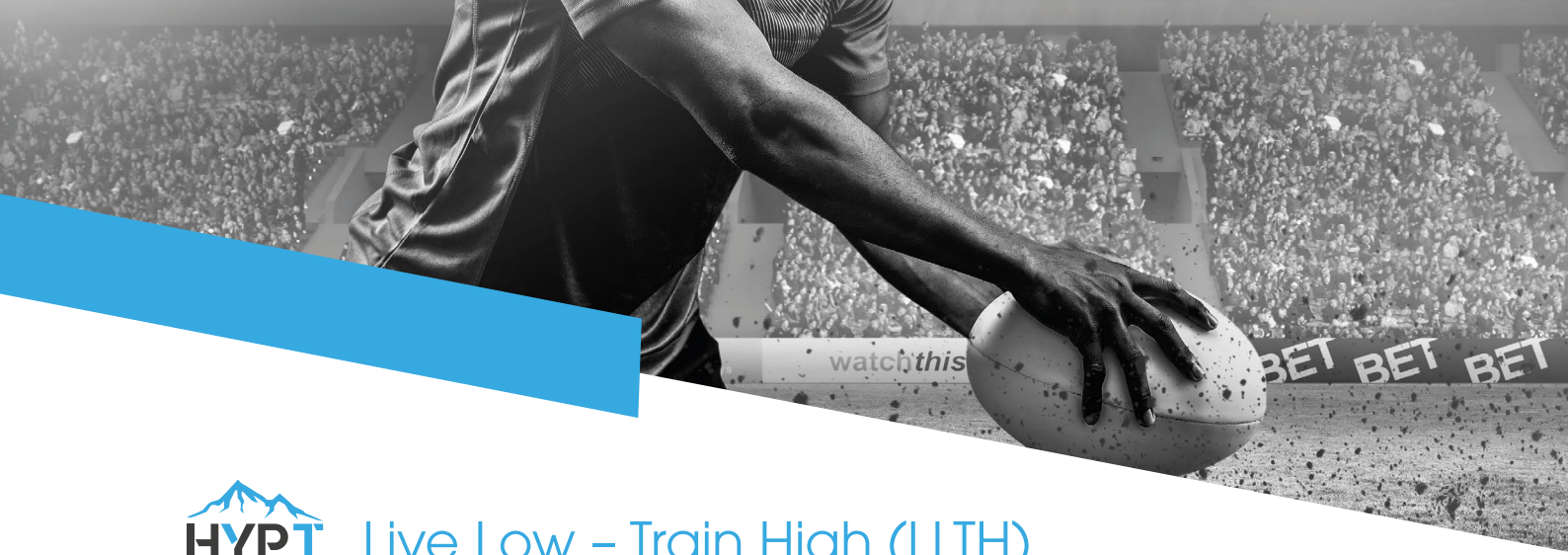
**in Repeated
Sprint Ability**

20%
INCREASE

**in Aerobic
Performance**

All achieved in as little as just 6 weeks.

RUN | CYCLE | SWIM | RECOVERY



Live Low – Train High (LLTH)

Altitude training sessions can give you a great workout with much less stress on your body or enhance the effectiveness of any workout you do and make your exercise more time efficient. Clients with limited exercise tolerance (e.g. can only walk) get more value from altitude training. Altitude training enhances and accelerates the positive outcomes of exercise on:

- VO2 max increase
- Lactate threshold increase
- Increased power output
- Increased Sprint repeat ability.
- Enhanced Endurance.
- Reduction in recovery times.
- Decreased heart rate
- Decreased blood pressure.
- Increased production and release of human growth hormone.
- Stimulation on fat-burning metabolism.

Less Effort, Less Time, and Better Results...



Live High – Train Low (LHTL)

HYP T's Sleep High Train Low is also an option, enabling clients to either sleep at the centre or rent the HYP T sleep package for home use.

This method can be also be supplemented into your athletes training program, giving all options available to train at altitude in your local area.



Ultimate Altitude training package:



2-3 x HIT sessions –
sleep low
(20-30minutes)



1 x IHE Session –
sleep low
(60-90 Minutes)



1 x Sleep High –
Train Low
(8-10hours)



Performance Chamber

The performance chamber can take up to two people at any one time, houses a commercial grade curved treadmill with several resistance levels and a Wattbike Pro or turbo trainer allowing the use of our clients own training bike or alternatively a Swimbeam training machine for those swimmers and Triathletes (please note the treadmill can be used for interval training with no maximum speed).

A proper altitude training program can substantially boost the body's oxygen transport systems through enhanced ventilation, naturally increased EPO production and increased mitochondrial efficiency. This will allow more efficient energy production both aerobically as well as anaerobically. Ultimately this will allow the athlete to experience:



**Increased
endurance
and speed**



**Less
Fatigue**



**Improved
recovery**

Scientific studies have shown improvements in VO₂ Max and Lactate threshold by as much as 10%.



Scientific Research Articles

Effect of intermittent normobaric hypoxic exposure at rest on haematological, physiological, and performance parameters in multi-sport athletes.

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. Twenty-two multi-sport athletes of mixed ability were exposed to either a normobaric hypoxic gas (intermittent hypoxic training group) or a placebo gas containing normal room air (placebo group).

The participants breathed the gas mixtures in 5-min intervals interspersed with 5-min recovery periods of normal room air for a total of 90 min per day, 5 days per week, over a 3-week period. The oxygen in the hypoxic gas decreased from 13% in week 1 to 10% by week 3. The training and placebo groups underwent a total of

four performance tests, including a familiarization and baseline trial before the intervention, followed by trials at 2 and 17 days after the intervention. Time to complete the 3-km run decreased by 1.7% [95% confidence interval (CI) = -0.6 - 3.9%] 2 days after, and by 2.3% (CI = 0.25 - 4.4%) 17 days after, the last hypoxic episode in the training relative to the placebo group. Substantial changes in the training relative to the placebo group also included increased reticulocyte count 2 days (23.5%; CI = -1.9 to 44.9%) and 12 days (14.6%; CI = -7.1 to 36.4%) post-exposure. The effect of intermittent hypoxic training on 3-km performance found in this study is likely to be beneficial, which suggests non-elite multi-sport athletes should expect such training to enhance performance.

Combining hypoxic methods for peak performance.

New methods and devices for pursuing performance enhancement through altitude training were developed in Scandinavia and the USA in the early 1990s.

At present, several forms of hypoxic training and/or altitude exposure exist: traditional 'live high-train high' (LHTH), contemporary 'live high-train low' (LHTL), intermittent hypoxic exposure during rest (IHE) and intermittent hypoxic exposure during continuous session (IHT). Although substantial differences exist between these methods of hypoxic training and/or exposure, all have the same goal: to induce an improvement in athletic performance at sea level. They are also used for preparation for competition at altitude and/or for the acclimatization of mountaineers. The underlying mechanisms behind the effects of hypoxic training are widely debated. Although the popular view is that altitude training may lead to an increase in haematological capacity, this may not be the main, or the only, factor involved in the improvement of performance.

Other central (such as ventilatory, haemodynamic or neural adaptation) or peripheral (such as muscle buffering capacity or economy) factors play an important role. LHTL was shown to be an efficient method. The optimal altitude for living high has been defined as being 2200-2500 m to provide an optimal erythropoietic effect and up to 3100 m for non-haematological parameters. The optimal duration at altitude appears to be 4 weeks for inducing accelerated erythropoiesis whereas <3 weeks (i.e. 18 days) are long enough for beneficial changes in economy, muscle buffering capacity, the hypoxic ventilatory response or Na⁺/K⁺-ATPase activity. One critical point is the daily dose of altitude. A

natural altitude of 2500 m for 20-22 h/day (in fact, travelling down to the valley only for training) appears sufficient to increase erythropoiesis and improve sea-level performance. 'Longer is better' as regards haematological changes since additional benefits have been shown as hypoxic exposure increases beyond 16 h/day. The minimum daily dose for stimulating erythropoiesis seems to be 12 h/day. For non-haematological changes, the implementation of a much shorter duration of exposure seems possible.

Athletes could take advantage of IHT, which seems more beneficial than IHE in performance enhancement. The intensity of hypoxic exercise might play a role on adaptations at the molecular level in skeletal muscle tissue. There is clear evidence that intense exercise at high altitude stimulates to a greater extent muscle adaptations for both aerobic and anaerobic exercises and limits the decrease in power. So although IHT induces no increase in VO₂max due to the low 'altitude dose', improvement in athletic performance is likely to happen with high-intensity exercise (i.e. above the ventilatory threshold) due to an increase in mitochondrial efficiency and pH/lactate regulation.

We propose a new combination of hypoxic method (which we suggest naming Living High-Training Low and High, interspersed; LHTLHi) combining LHTL (five nights at 3000 m and two nights at sea level) with training at sea level except for a few (2.3 per week) IHT sessions of supra-threshold training. This review also provides a rationale on how to combine the different hypoxic methods and suggests advances in both their implementation and their periodization during the yearly training programme of athletes competing in endurance, glycolytic or intermittent sports.

30 minutes performance chamber session	£18
12 month package free use	£175 pm
6 week pre event programme (3 session a week) Total sessions 25% discount	£243

Equipment hire

Generator Hyp-10 + deluxe sleep tent	£360 pm
Generator HYP-10 + inflatable chamber	£460 pm
Generator HYP-10 + Mask system	£280 pm

Equipment purchase

Generator HYP-10	£1,800
Tent	£350
Chamber	£1,500
IHE Mask System	£120





THE HYPOXIC TRAINING CENTRE

North Wales Premier Hypoxic Training Centre.
Arweinfa, Gwaenysgor, Flintshire, LL18 6EP

t. 07810333397 **e.** mike@hyp-t.com **w.** www.hyp-t.com