

# **HYPERBARIC OXYGEN THERAPY**

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## **What is Hyperbaric Oxygen Therapy?**

Oxygen is essential to life and in fact when respiration ceases, cellular death begins in 4-6 minutes. While oxygen is vital in supporting all forms of aerobic life, it is increasingly important for the sick and injured whose capacity for oxygen absorption and distribution is compromised. Hyperbaric Oxygen Therapy (HBOT) technology is used in both human and veterinary medicine to treat medical conditions and also sports related injury.

The air we breathe is 21% oxygen, 79% nitrogen and minor amounts of other gases. While people and animals are able to heal themselves at normal oxygen levels, elevated oxygen levels enhance the healing processes. Traditional therapies such as deep tissue massage, magnetic and laser therapy all assist in increasing blood flow and therefore oxygen to an affected area but only at normal levels carried by red blood cells. Hyperbaric Oxygen (HBO) is a mode of therapy in which a patient breathes 100% oxygen at pressures greater than normal atmospheric (sea level) pressure. HBOT involves the systemic delivery of oxygen at two to three times greater than atmospheric pressure by dissolving oxygen into plasma and through the 100% saturation of hemoglobin. Oxygen in an animal patient's blood and tissues at a level of 2 atmospheres is 15 times greater than is normally present in a human patient under the same conditions. At that pressure, oxygen diffuses through tissues even when blood supply is significantly compromised (eg swelling, bruising after injury) and at an average distance of 5-7centimeters. In the instance of damaged or constricted vessels, plasma flows through them better than red blood cells that normally carry the oxygenated blood. When plasma is under the infused with hyperbaric oxygen, it carries 20 times more oxygen alone without even the red blood cells being utilized. Oxygen delivered by HBOT can make the difference between cell death or cell recovery.

## **What are some applications for Hyperbaric Oxygen Therapy?**

The extra oxygen is used by the patient's body in many ways. Depending on the underlying problem, the actions can include improved wound healing by reduction of swelling, infection control and the stimulation of new blood vessel growth. In addition to the use of HBOT technology in injury prevention and rehabilitation, hyperbaric therapy is now the foremost maintenance therapy used by athletes and sporting institutions world wide. The major benefits of HBOT in sports medicine are:

- Reduces swelling and pain
- Prevents cell death of traumatized tissues
- Speeds up the healing of tissues, ligaments and fractured bones
- Reduces scar tissue formation and damage
- Maintains optimum fitness
- Speeds up return from injury

AFL teams routinely utilize HBOT to both maintain the physical soundness of players and to treat specific injuries. An entire season's success can depend on the length of time key players spend on the road to recovery. They are aware that injuries are extremely damaging to a club's financial performance and any steps taken to lessen their impact will register as significant cost savings. In the same way, greyhounds that perform reliably, regularly and recover quickly are a better investment of a trainer's time and finances.

### **What is a hyperbaric chamber and how does it work?**

The hyperbaric chamber is a cylindrical structure resembling a submarine(monoplace). It has 4 greyhound-sized internal cages and two portholes for monitoring of patients. To simulate the atmosphere of between 16-46 feet underwater – twice normal atmospheric pressure, the chamber seals allowing the pressure to build within. The chamber is then infused with 100% oxygen. The unit follows a cycle that includes periods of chamber pressurization, maintenance at therapeutic levels and then depressurization. The whole cycle takes approximately 1.5 hours.

### **How do greyhounds cope with being in a hyperbaric chamber?**

In our experience, most patients are comfortable during the therapy sessions and take the opportunity to sleep. During the period where the pressurized air enters the chamber, patients may experience change to the pressure in their ears. Anxious patients may be given a mild sedative prior to treatment but most do not require this.

### **The Cost Effective Performance Edge**

HBOT has been demonstrated to return animals to peak performance quickly and safely. This is important for dogs on the race circuit, where downtime means fewer win opportunities. As this form of treatment is systemic (treats the patient as a whole) the benefit to the greyhound trainer is that not only are specific injuries treated but also those that have gone undetected. Trainers can concentrate on a improving the training regime rather than performing time-consuming physical treatments and administering costly supplements / medications. Furthermore, HBOT improved the efficacy and delivery of medications such as antibiotics and fights infections and as a direct result reduces healing times. The simple economy of HBOT sessions is that sound, healthy dogs can perform more often, with greater chance at success and are therefore a better financial prospect. Treatment protocols for specific injuries usually range from 2-5 treatments whilst maintenance cycles can be run every 7-10days.

### **Uses of Hyper Baric Oxygen Technology in Racing Greyhounds**

HBOT has been proven to be beneficial in all conditions in which healing is compromised due to poor oxygen supply to the damaged areas. This includes:

- Bone / Stress Fractures (post-operative care)
- Tendon Injuries and Sprains
- Rhabdomyolysis (Acidosis)
- Wound Healing
- Muscle Injury
- Bruising and Swelling (eg.'Track Leg')
- Viral and Bacterial Infections
- Travel Recovery (eg. interstate or in the heat)
- Insect Bites (eg. White Tail Spider)
- Post-Race Recovery
- Pre-Race Form

HBOT allows dogs to return to form quicker as it speeds up post race recovery and can help heal injuries which have been previously considered career ending.

### **References :**

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equineox technologies Ltd , Maple Ridge , BC Canada