

# Hyperbaric Oxygen Therapy

## A Record of Innovation

For more than 130 years, the veterinarians of Hagyard have endeavored to bring only the best and most innovative treatments to assist in healing and restoring the health of their equine patients.

Hyperbaric Oxygen Therapy (HBOT), long a common lifesaving practice in human medicine, is a relatively recent arrival on the horse scene – mainly because of the large size and unique requirements necessary for its use with this four-legged species.

Hagyard veterinarians began treating bone and joint infections in horses using HBOT about five years ago, and a small hyperbaric chamber was available for foals. However, they knew more could be done with the right equipment and facilities in place. Thus, a large, state-of-the-art hyperbaric chamber was recently installed in its own new wing at the McGee Medicine Center building and quickly put to use with excellent results.

## The Healing Power of Oxygen

At sea level every breath you take of fresh air consists of 21 percent oxygen. The rest is 78 percent nitrogen and about 1 percent carbon dioxide and other gases. Nevertheless that 21 percent is usually enough to sustain life and aid the body in healing injured or diseased tissues.

Sometimes, however, particularly when trauma, infection or other complications occur, more oxygen is needed to assist in the healing process. Additional oxygen can be obtained by breathing it in through a mask. Unfortunately, only a limited amount of the needed gas will actually dissolve in the blood.

HBOT, delivered in an airtight chamber at increased atmospheric pressure, can help a patient to breathe in 100 percent oxygen up to twice the normal level and therefore deliver more oxygen to affected tissues.

The result? Improved tissue healing and shorter recovery times.



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## The Hagyard Hyperbaric Chamber

The Hagyard hyperbaric chamber has a large, open room design similar to a round stall, allowing the horse to relax and move around comfortably. After the first session or two, most patients grow accustomed to the space and the process becomes as simple as loading the horse into a trailer.

A person (veterinarian or technician) trained in hyperbaric medicine (International ATMO) is on hand at all times and constantly observes the horse using a series of video monitors from different perspectives.

The chamber at Hagyard also has two doors, a safety feature which allows a person to enter the space through a smaller door in case the horse chooses to lie down or lean against the larger, main entrance door.

## How HBOT Works

In basic terms, we are exposed at sea level to “1 ATA” (Atmosphere Absolute) – which is considered to be normal atmospheric pressure. When one dives underwater, for each 33 feet (or 10 meters) one travels down beneath the sea, the pressure increases one atmosphere, or “2 ATA” at 33 feet.



This is the relative pressure most patients are exposed to during clinical HBOT. At “3 ATA” (the maximum pressure allowed by law when treating patients), as the patient breathes in 100 percent oxygen, an incredible 14 times as much of the healing gas is absorbed than at sea level.



This high concentration of oxygen has the following valuable effects:

- Blood vessels constrict, reducing swelling and stimulating healing through increased cell division
- Decreased oxidative injury to cells
- Effects of certain antibiotics are enhanced, particularly those needing higher oxygen environments in order to better heal severely infected tissue
- Inflammation is reduced, and immune-stimulating effects may occur

## Conditions Which Benefit from HBOT

Initially used for human decompression sickness (the “bends”) in divers, HBOT later proved beneficial for a variety of conditions affecting our equine patient.

- Serious and chronic infections
- Wounds and blood-deprived tissue
- Compromised skin grafts
- Air and gas embolisms (“bubbles”)
- Clostridial myositis
- Speed healing of selected injuries
- Aid in recovery from carbon monoxide poisoning, smoke inhalation
- Accelerate collagen deposition
- Treatment of bone infection

- Treatment of gas gangrene
- Post-operative colon torsions
- Laminitis
- Gastric ulcers, colitis and intestinal diseases
- Lung and abdominal abscesses
- Birth asphyxia (‘dummy foal’ syndrome)
- Skin, muscle, tendinous and ligamentous injuries

## HBOT Sessions

As each session begins, the horse enters the chamber and the airtight door is firmly locked. Air pressure is gradually increased, delivering oxygen into the floor and slowly removing normal air through the roof.

After about 30 minutes, the treatment pressure and maximal oxygen concentration is reached. Total time in the chamber varies from 45 to 60 minutes.

The number of treatments required, maximal pressure and time in the chamber depends upon the condition being treated and the general health of the patient. For example, a bone infection might require 15 to 20 sessions.

## HBOT as Supportive Treatment

Hyperbaric Oxygen Therapy is considered to be supportive or adjunctive treatment. The disease or condition being treated is still managed with other medical treatments, as well.

The goal at Hagyard is to use HBOT to shorten the recovery time for injuries and illnesses, and should be viewed as something used to enhance tissue healing. The final results desired include improved survival rates for serious conditions, less time spent in the hospital, and a healthier horse overall.

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