

# AN INTRODUCTION TO MILD HYPERBARIC OXYGEN THERAPY

## What is Hyperbaric Oxygen Therapy?

Hyperbaric Oxygen Therapy is the use of oxygen under higher than normal atmospheric pressures as a medical treatment.

## What does Hyperbaric Oxygen Therapy do?

Increasing the atmospheric pressure creates an environment where oxygen gas dissolves more easily into the surrounding liquids, such as the blood plasma and cerebrospinal fluids. This increased oxygenation allows for many health benefits, such as cell growth and regeneration, detoxification, immune support, new capillary growth, and improved neurological functioning.

“When the oxygenated plasma circulates near dormant or injured tissue such as an encephalopathic brain, a bruised muscle, a sprained tendon, or a surgical wound, the oxygen in the plasma can and does dissolve further into the damaged area than the oxygen that’s attached to the red blood cell in that “traditional” delivery system.” (Buckley, 2005).

## What are the different types of Hyperbaric Oxygen Therapy?

Hyperbaric medicine is separated into two types of Hyperbaric Oxygen Therapy - high pressure and low pressure. High pressure is generally referred to as high pressure HBOT, hospital grade HBOT, or just HBOT, and is designated as above 2 absolute atmospheres. Low pressure hyperbarics refers to pressures below 2 absolute atmospheres. There is also a very low pressure hyperbaric oxygen therapy referred to as mild hyperbarics or mHBOT. This is hyperbaric oxygen administered at 1.3 absolute atmospheres. Each type of hyperbaric oxygen therapy has its advantages and disadvantages. The higher pressures are very useful in acute illnesses, and the lower pressures are safer, generally without major side-effects, and better for chronic illnesses.

### Mild Hyperbaric Oxygen Chambers

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Relatively low purchase price</li><li>• Requires little space</li><li>• No need to renovate facility for oxygen and electrical requirements</li><li>• Modest staffing requirements. Patients can self load for home use</li><li>• Ease of portability in case of relocation</li><li>• Air-over system means extra oxygen is not required</li><li>• Less depressurization time means relatively quick exit</li><li>• No risk of fire</li><li>• FDA approved for home use</li></ul>	<ul style="list-style-type: none"><li>• Limited pressure capability</li><li>• Not accessible by gurney</li><li>• Chamber body while durable, is not as durable as stainless steel.</li></ul>

<b>Hospital Grade Hyperbaric Oxygen Chambers</b>	
<b>Advantages</b>	<b>Disadvantages</b>
<ul style="list-style-type: none"> <li>• Greater working pressure- allows more flexibility in treatment</li> <li>• Durability- chamber made of stainless steel</li> <li>• Stainless steel chamber does not cause problems with chemically sensitive people</li> <li>• Ability to use a variety of electrically generated signals during therapy</li> <li>• Ability to conduct intensive care activities during treatment</li> <li>• Insurance reimbursable for certain circumstances</li> </ul>	<ul style="list-style-type: none"> <li>• Higher capitalization requirements</li> <li>• Major space requirements; basement and/or ground floor level limitations</li> <li>• Higher operating costs</li> <li>• Larger and experienced staffing requirements</li> <li>• Risk of decompression sickness in internal personnel</li> <li>• Facility fire-associated decompression requirements</li> <li>• Significant equipment maintenance and system upkeep requirements</li> <li>• Associated fire hazard with pure oxygen environment</li> <li>• Risk of oxygen toxicity as well as increased risk of complications from pneumothorax and/or tension pneumothorax and arterial air embolism developing during decompression</li> <li>• Permit requirements by FDA, local health department, and fire marshal</li> </ul>

Chart from HBOTreatment.com

When considering the difference between hospital grade, low pressure and mild HBOT for the treatment of neurological disorders, the Quebec/McGill study is at the forefront of comparisons. This study was performed to test the use of low pressure HBOT(1.75 ATA) in the treatment of cerebral palsy. The experiment was intended to be a double blind study with mild HBOT at 1.3 ATA serving as the placebo. What they found is that the results for patients at 1.3 ATA and 1.75 were almost identical in improvement, and the patients at 1.3 ATA experienced better results with fewer side-effects in many cases (Stroller, 2004).

One of the great advantages of mHBOT is the low number of contraindications, risks and side effects. “This is one of the lowest risk procedures in all of medicine,” says Paul Harch, M.D., a leading hyperbaric medicine expert, about mHBOT.

### **How does Hyperbaric Oxygen do for autism?**

The methodology for using HBOT to treat autism comes from research on other neurological disorders. Increasing research shows that in autism and other neurological disorders there are areas of the brain lacking in blood flow and oxygen, and that when these areas of the brain are exposed to HBOT the blood flow and level of activity in these portions of the brain returns to normal. Autistic children who have done mHBOT treatments have almost universally benefited to some degree from the treatment.

“In addition to impacting cerebral brain flow in injured brains, lower pressure hyperbaric therapy has been shown to positively impact natural killer cell function and thus, immune function. It has also been found to be of benefit in inflammatory conditions and has facilitated improvement in gut disease such as Crohn’s and ulcerative colitis. mHBOT has been shown to increase glutathione levels by 15% for at

least 24 hours after therapy in previous studies. These areas are all of interest for parents of children with Autism Spectrum Disorders (ASD) as they are often impaired in their children.” (Buckley, 2005).

Children on the autistic spectrum experience improvement in a wide range of their symptoms with mHBOT treatments, including increased language ability, better socialization, less aggression, improved bowel function, and better cognition, to name a few.

“HBO reduces cerebral edema and improves the function of neurons rendered inactive by ischemia/hypoxia.”

-Textbook of Hyperbaric Medicine, K.K. Jain

### **Are there any Side Effects that go along with HBOT?**

Yes, there are a few but the great benefits often out weight the side effects in most cases. The **bold** are common side effects and the others listed are rare.

\* **Ear and Sinus pain or discomfort from the change of pressure, this can be minimized by ventilating or (popping) the ears well during pressurization, or by slowing your dive speed/ descend a little until you are comfortable.**

\* **Temporary Drowsiness**

\* **Temporary Hyperactivity**

\* Temporary Dizziness

\* Temporary Vision changes

\* Temporary Headache or nausea (Can be caused by die off or enhanced detoxification)

\* Temporary Regression (Can be caused by die off or enhanced detoxification)

**Is there any health problem(s) that would prevent someone from going into the chamber?** Yes here is a list. If there are any questions about this please let us know so that we can obtain medical clearance to go into the Hyperbaric chamber.

\* Acute asthma attack

\* High Fever

\* Uncontrolled seizure disorder

\* Optic Neuritis

\* Pneumothorax

\* Known ear infection or upper respiratory infection

\* Aneurism

\* Glaucoma

\* Pregnancy

\* Severe heart or lung disease

\* Congenital spherocytosis

\* Currently taking: Cisplatinum, Disulphiram, or Doxorubicin

### **What Protocol is used at Hirani Wellness?**

Hirani Wellness follows the most commonly recommended protocol of 10 - 40 one hour sessions of mHBOT at 1.3 ATA or 1.5 ATA twice a day for 5 days a week, to start out. Parents are given printed information

about mHBOT, and sign an informed consent document that includes statements that acknowledge that this treatment is not FDA approved for this indication (see attached documents). A parent always accompanies the child into the chamber and keeps them occupied for the duration of the treatment.

This is the same protocol used in other studies supporting mHBOT for improved neurological functioning, such as that of Gunnar Heuser, M.D. There are three additional studies that are going to be ready for publication in the year 2006, all showing the safety and efficacy of mHBOT as a useful adjunctive treatment for the brain injury found in autistic children.

1. Autism and it's Growing Hyperbaric Movement. (2005) *The Pressure Point*, 6, 1-2,15.
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3. Harch, P.G., & Small, T. (2005) Interview with Dr. Paul Harch: the application of hyperbaric oxygen therapy in chronic neurological conditions. *Medical Veritas* 2, 637-646.
4. Heuser, G. Clinical Study: Mild Hyperbarics for Impared Brain Function.
5. Report of a meeting. (2002) Hyperbaric oxygen therapy in the treatment of brain injury. *The Exceptional Parent*, 32, 64-66.
6. Stoller, K. P. (2005) Quantification of Neurocognitive Changes Before, During, and After Hyperbaric Osygen Therapy in a Case of Fetal Alcohol Syndrome. *Pediatrics*, 116, 586-591.
7. Stoller, K. P. (2004) Hyperbaric Medicine and Brain Injured Children. The International Hyperbaric Medical Association Foundation, Testimony to the United States House of Representatives.