



Hyperbaric Oxygen Therapy (HBOT) for ASD (Autism Spectrum Disorders)

HBOT is a treatment that has recently become quite popular in the ASD community. Its benefits cross a wide range of autistic traits: improved language, increased awareness, independence, self-confidence, and improved bowel function (from a list of approximately 20 known benefits or effects).

The definition of HBOT is “the inhalation of 100% oxygen at greater than 1 atmosphere of pressure in a pressurized chamber”. The definition has been modified in recent years due to changes in the amount of oxygen administered during treatments, where it now is considered to be any percentage of oxygen greater than 21% (which is the amount of oxygen in the air we generally breathe). Scientific studies show that pressurizing oxygen reduces inflammation, as well as causes more oxygen to dissolve into extracellular body fluids (e.g. plasma, lymph, cerebrospinal fluid, or interstitial fluid) which in turn allows more oxygen to reach cells and organelles. Increased oxygenation positively supports many biochemical reactions.

Other known HBOT effects include:

- Angiogenesis (production of extra blood vessels to organs/tissues)
- Up-regulation of antioxidant enzymes
- Increased oxygenation to mitochondria
- Increased production of mitochondria
- Reduces systemic or gastrointestinal viral loads
- Increases stem cell production

In a simplified explanation, HBOT’s effects are from reducing inflammation and oxidative stress. The effects on the brain or nervous system are obvious by the vast number of neurologic improvements. Children with chronic gastrointestinal infections (bacterial, yeast) also gain improvements in their digestion and bowel habits.



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There are two types of HBOT chambers: hard-shell, and soft-shell. HBOT's benefits in other neurologic disorders (e.g. cerebral palsy) were found with treatments in hard chambers using 1.5 ATA pressure and 100% oxygen. Early studies in children with ASD's used similar settings in single or multi-person chambers.

Typical treatment protocols using HBOT are as follows:

1. A series of at least 40 treatments (known as "dives"), preferably over 1-2 months.
2. Each dive lasts 60 minutes, but is preceded by a 10 - 15 minute period where the pressure is gradually increased, and a 10 minute period of depressurization after treatment
3. If treatment is done in a hard chamber, 100% oxygen will be "fed" into the chamber. In multi-person chambers, patients recommended to receive 100% oxygen must wear extra equipment (essentially a helmet that encloses the head) to breathe the concentrated oxygen.
4. After 40 dives are completed, the patient will wait for 3-4 weeks before continuing treatment. Frequency and total number of treatments is recommended by a physician. Regular "maintenance" treatments are also scheduled.

Two possible but infrequent side-effects of HBOT in ASD patients: increased stimming, and hyperactivity. Clinical experience shows the opposite occurs: less stimming and being calmer.

Patients should be checked regularly for pre-existing ear infections, although this is not an absolute contraindication to the treatment (and minor ear infections will probably improve with HBOT). Sinus infections or significant sinus congestion are considered reasons for postponing HBOT sessions.

Claustrophobia and pre-existing hyperactivity may make it difficult for patients with these conditions to complete HBOT. A trial of the treatment is recommended, and herbal or homeopathic remedies could be recommended to calm the patient for treatment.

Recent research, especially by Defeat Autism Now! physicians have employed soft-shell chambers. This equipment is limited to a maximum pressure of 1.3 ATA and an oxygen level of 24%. The research and anecdotal evidence began to show similar outcomes between the two types of systems, where it had been expected that higher pressures and oxygen levels (in hard shell chambers) would give superior results. The key attraction to using soft-shell chambers is the convenience for families who cannot find treatment centres with hard-shell chambers near their homes, or who cannot schedule treatments while other therapies (e.g. ABA, Speech, or Occupational therapy) are in use.



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A recent study by Dr's Jeff Bradstreet and Doreen Granpeesheh (HBOT at 1.3 ATA, soft chambers, 24% oxygen) failed to show a significant difference in the treatment group versus the sham (i.e. placebo) treatment. It should be noted that all children in this study continued receiving intensive ABA therapy along with their 80 treatments. Conclusion: more research needs to be done! This may also point to the recommendation by some physicians that the initial series of 40 dives should be done in a hard-shell chamber using 100% oxygen, then maintaining the benefits using soft-shell chambers.

Anecdotal reports at Touchstone Naturopathic Centre are limited but generally do confirm that most children see benefits after 30-40 treatments. The reported benefits or effects are similar to those noted above.

Should You Consider HBOT for Your Child?

At the time of writing this overview, an outline of recommended preparation for HBOT has not been found or determined. Most information indicates that ASD children should be receiving Methyl-B12 treatments along with basic biomedical treatments. Heavy metal toxicity should be tested and treatment initiated for 1-2 months before beginning HBOT. Antioxidant supplements (e.g. including Vitamin E, C, Selenium, CoQ10, etc.) should be part of a patient's daily regimen or can be added through specific products (check Lee Silsby Compounding Pharmacy, New Beginnings Nutritionals or Kirkman Laboratories).

ASD patients that should be considered for HBOT include:

- those who have had minimal response to biomedical treatments, including MeB12
- those who have chronic gastrointestinal complaints (especially bacterial and yeast infections)
- those whose tests show oxidative stress and/or mitochondrial dysfunction

For further information, please contact Dr. Scott Clack, ND at Touchstone Naturopathic Centre.