

The Center for Therapeutic Learning and Communication, PLLC



HYPERBARIC OXYGEN TREATMENT AT TLC YIELDS GREAT RESULTS

A study on the treatment of hyperbaric oxygen was run at TLC with two male children on the autism spectrum. Subject #1 was 6 year 8 month old at the beginning of the study. Subject #2 was 5 year 3 months old. This study began on 6/22/09 and continued for 3 months with an ending date of 9/22/09. The Autism Treatment Evaluation Checklist (ATEC) was used for assessing progress. The ATEC was completed before treatment began and after every 20 visits in the chamber. Both subjects completed over 100 visits. Visits were completed 2 times a day, 5-6 days a week for 3 months. The ATEC was written by Bernard Rimland, Ph.D. of the Autism Research Institute (ARI) and has been in use for many years. It is intended to measure the effects of treatment. The ARI provides free scoring through their website.

The ATEC is divided into four sections as follows:

- I. Speech/Language/Communication
- II. Sociability
- III. Sensory/Cognitive Awareness
- IV. Health/Physical/Behavior

The higher the score, the more impaired the subject.

Subject #1

6yr 8month old boy	before Hbot	20 visits	40	60	80	100
I Speech/ Language	10	8	8	9	6	6
II Sociability	14	13	13	13	13	12
III. Sensory/ Cognitive Awareness	15	14	14	15	14	13
IV Health/Physical Behavior	23	20	20	16	20	20
TOTAL	62	55	55	53	53	50

This subject decreased his score by 12 points total which equals a 19.3% decrease (the lower the score

the less impaired). Another ATEC is scheduled to be completed at 1, 2 and 3 months post HBOT.

Subject #2

5yr 3 month old boy	before Hbot	20 visits	40	60	80	100
I. Speech/ Language	12	11	9	8	10	10
II. Sociability	19	16	22	17	20	20
III. Sensory/ Cognitive Awareness	18	20	16	14	16	14
IV. Health/Physical Behavior	45	39	32	33	35	35
TOTAL	94	86	79	72	81	79

This subject decreased his score by 15 points which equals a change of 16%. Post HBOT scores to be completed at 1, 2, and 3 months to evaluate cumulative progress.

The chamber that was used for this study was a “Dive” made by Summit by the Sea. It measures 40” in diameter and is 9 feet long, enough room for the child and caregiver. The operational pressure was 4.3 PSI and 1.3 ATA. This is described as Mild Hyperbaric Treatment. The use of an Oxygen Concentrator was included. The SeQual Integra 10 Ipm O2 concentrator with 6.5 – 7 PSI output with a built in O2 Purity Sensor for proper oxygen output was used. The O2 was run through a tube into the chamber and could be utilized via face mask, if the subject chose to do so. Subject #1 utilized the mask 30% of the trials, keeping it on his face approximately 5 minutes of 30 visits. Without the mask the subject was still receiving pressurized air equal to 8 feet under water. Room air was mixed with oxygen from the concentrator and pumped into the pressurized chamber resulting in an oxygen concentration of 28-30% inside the chamber. No side effects were reported except increased hyperactivity in both subjects. The following list displays improvements observed by the subjects’s family, therapists, teachers and caregivers that interact with these children every day.

After HBOT :

- Increased sleep patterns were noted and melatonin discontinued for one child.
- Potty training began (always resistant before HBOT)
- An increase in spontaneous relevant language
- Increased awareness of others and environment
- Decrease in meltdowns and quicker recovery
- Decrease in self-stimulatory behavior
- Increased eye contact
- Increased cooperation
- Increased initiation of conversation
- Increased curiosity, more interest in others
- More tuned in, less spacey
- After 20 visits, increased hyperactivity that has now returned to a normal arousal level
- Decrease in sound sensitivity

- Increased flexibility with schedule and changes
- Decrease in agitation
- Decrease of repetitive movements

This study had several limitations. Both subjects were allowed to continue all other therapies for autism including supplements. Thus, some gains could have come from other therapies. Parents were not blinded to the fact that their children received HBOT and the ATEC is a parent rated scale both of which could lead to bias. Thus improvements could have been due to natural development of the children, although no developmental spurts were reported. Lastly, this study lacked power because the sample size was small. Despite these limitations, the analysis of this study suggests substantial clinical benefits were produced, and therefore, further research is needed.

Post HBOT scores to come at 1 month 10/22/09, 2 months 11/22/09, 3 months 12/22/09. TLC will post the scores when complete. If you have any questions or comments, please direct them to Tori McWherter at TLC 586 421-4062.

HOW DOES HBOT HEAL?

Under pressure in the chamber, oxygen is more readily absorbed into the body tissues, blood and organs. The oxygen travels into parts of the brain that it wouldn't receive otherwise secondary to the pressure. HBOT has potent anti-inflammatory effects and reduces oxidative stress.(1) HBOT can compensate for decreased blood flow by increasing the oxygen content of plasma and body tissues and can even normalize oxygen levels in ischemic tissue(1). HBOT mobilizes stem cells from human bone marrow, which may aid recovery in neurodegenerative diseases(1). Multiple independent single photon emission computed tomography (SPECT) and positron emission tomography (PET) research studies have revealed hypoperfusion (low oxygen flow) to several areas of the brain in a person with autism, most notably the temporal regions and areas specifically related to language comprehension and auditory processing(1). Several studies show that diminished blood flow to these areas correlates with many of the clinical features associated with autism including repetitive, self-stimulatory and stereotypical behaviors, and impairments in communication, sensory perception, and social interaction(1). HBOT has been used with clinical success in several cerebral hypoperfusion syndromes including **cerebral palsy, fetal alcohol syndrome, closed head injury, and stroke(1)**. It is hypothesized that HBOT will improve symptoms in persons with autism(1). More studies are needed.

References: (1) Rossignol and Rossignol, Blue Ridge Medical Center, 4038 Thomas Nelson Highway, Arrington, VA 22922, USA University of Virginia, P.O. Box 800729, Charlottesville, VA, USA, Received 26 January 2006;accepted 7 February 2006. Article in Press, *Hyperbaric oxygen therapy may improve symptoms in autistic children*.

Research studies are available online at www.sciencedirect.com

ATEC is available online at www.autism.com/ari/ATEC