



Complex Child E-Magazine

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Hyperbaric Oxygen Therapy: What is it and will it work?

by Varsha Daryanani

What is it?

Hyperbaric oxygen therapy (HBOT) is the inhalation of varying degrees of pressurized oxygen at greater than one atmosphere absolute in a pressurized chamber. While FDA approved for wound healing, carbon monoxide poisoning, burns, infections, and decompression sickness, it is also used in the treatment of several other conditions, including stroke, cerebral palsy, autism, brain injury, diabetes and learning disabilities.

HBOT for these additional conditions is still a relatively new form of “alternative” therapy and, thus, often receives widespread negative sentiment in the medical community. Medical doctors are not trained on HBOT in medical school and most know next to nothing about HBOT or its effects on the injured brain. Outdated negative misperceptions of HBOT and unfavorable public statements by medical doctors also cloud the picture.

Most insurance companies do not cover the cost of HBOT because it is still considered “experimental” for the treatment of certain conditions, though several insurers and state Medicaid systems have begun covering the procedure in the past few years. As such, HBOT is often not an option for many patients because the out-of-pocket costs are extremely high.

HBOT is a safe treatment option for many and the side effects are minimal if performed correctly. The most common side effects include sinus squeeze, seizure, claustrophobia and hyperactivity.

There is scientific evidence that pressure, independent of the concentration of oxygen, decreases inflammation and that any concentration of oxygen under any increased amount of pressure will allow more oxygen to dissolve into the extracellular fluids of the body: plasma, lymph, cerebrospinal fluid and interstitial fluid. Because dissolved oxygen is not confined to a hemoglobin molecule, it can go wherever body water goes and therefore reach deeper tissues more easily and more consistently than ever before.

There are multiple benefits of HBOT. These include:¹

1. The growth of new blood vessels and increased blood flow to the brain.

2. Decrease in the levels of inflammatory biochemicals.
3. Increased oxygenation to functioning mitochondria and increased production of new mitochondria.
4. Improvement in immune and autoimmune system disorders.
5. Decreases in the bacterial/yeast load found in the gut.
6. Increased production and utilization of serotonin.

Hopefully in the future there will be more scientific evidence for HBOT's use in cerebral palsy and other brain injuries. There have been very few studies on HBOT for cerebral palsy and brain injury, and unfortunately most studies on the subject thus far have been small or flawed, with only one well-performed, controlled and randomized study at this time.² The results of this study neither proved nor disproved HBOT since the study evaluated HBOT versus pressurized room air. Both treatments showed remarkable improvements in children, perhaps suggesting that it is the pressure rather than the level of oxygen that is of benefit. In any case, further randomized and blinded studies need to be performed in the future and an NIH-sponsored trial is underway currently at Wright State University.

It is important to understand that HBOT is a treatment and not a cure. It has the potential to be a powerful tool when used in conjunction with all the other therapies that a child is receiving.

Will it work? Our Experience

As with any other treatment, the level of success attained from HBOT varies from child to child. That being said, our experience has been extremely positive and, when time allows, we would like to continue with HBOT for our child.



Our daughter, Alisha, was born with a genetic disorder called Wolf-Hirschhorn Syndrome, which basically means that she has a deletion of the 4p chromosome. In February 2007, she had a major seizure and, as a result, she suffered from cerebral edema. When she was released from the hospital after spending 23 days in the PICU, she came home with an additional diagnosis: cerebral palsy.

My husband and I were so devastated. The child we brought home was “brand new” to us. The Alisha we remembered used to roll over, hold toys, smile, laugh and almost sit up on her own. The Alisha we brought home was like a newborn. She regressed 100% developmentally and was so spastic that we had a hard time even changing her diapers. The doctors had told us that it could take anywhere between 12-18 months for her to recover from her brain injury. As we mourned the loss of the “old” Alisha, we scoured the internet for alternative therapies that could help the “new” Alisha recover from her injury. That is how we first learned of HBOT and we’ve never looked back since.

As with any other treatment for Alisha, we consulted her doctors regarding HBOT. Her neurologist immediately shot the idea down and said that there wasn’t enough evidence that HBOT would work. Her GI doctor and orthopedic surgeon felt the same. Her pediatrician wasn’t as opposed to it, but she didn’t exactly tell us to “go for it” either. We became a little discouraged since none of the doctors felt that the treatment would be beneficial, so we put the idea on the back burner for a couple of months. As time passed, it became increasingly clear that Alisha’s recovery was going to be very slow. Six months after her seizure, she still wasn’t smiling and she was still very spastic. Once again, we did research and this time, we decided to give HBOT a try.

We did the first round of treatment (40 sessions) and immediately noticed an improvement in Alisha. For the first time in her life, she started sleeping through the night! I thought to myself, “if this is all we get out of this, it is worth it!” Luckily, we saw other positive changes too. Alisha became more alert and aware of her surroundings. She also started smiling again! And last but not least, we noticed a huge improvement in her muscle tone, and her spasticity decreased significantly. After our first round of treatments, we went back to the orthopedic surgeon for a follow up and I clearly remember his reaction when he saw Alisha. He was shocked at how her muscle tone had decreased. In fact, he even asked me what medications I was giving her to decrease her tone. I looked him square in the eye and said “oxygen.” Needless to say, I think I may have made a believer out of him because now he asks questions about HBOT all the time.

In August 2008, we did a second round of treatment (another 40 sessions) and we saw improvements then, too. For the first time ever, Alisha started vocalizing when spoken to, cooing and humming. I was so elated!! She also started moving her arms and legs. A couple of weeks ago, we had an appointment with her neurologist and she was so pleased with how well Alisha looked. It was the first time she had seen her respond to voices and move her arms and legs. She even said, “I guess all of that physical therapy is working.” I almost didn’t say anything to her, but then decided to confess and let her know that we had been doing HBOT “behind her back.” Initially, she seemed a little stunned, but now surprisingly receptive to this form of alternative treatment. She even told me about a new study that is being done at UCLA on HBOT in brain injuries. She said she’d keep her eyes open for the report and forward it to me when she got it. I think we may have made a believer out of her too!

The time commitment for HBOT is intensive: an hour a day, every day, for 40 days. The financial drain is outrageous. It’s physically and emotionally exhausting for Alisha and for me. Despite those things, we are glad we pursued the treatments even though Alisha’s doctors advised us not to. We felt that we would never know if HBOT would work unless we tried it. For Alisha, it’s working and we look forward to continuing treatments next year.

Varsha Daryanani is a full-time mom to Alisha, a 3-1/2-year-old diagnosed with Wolf-Hirschhorn Syndrome and Cerebral Palsy. Prior to becoming a mom, Varsha was a Commercial Real Estate attorney for a mid-size California law firm.

¹ See Michael Neumeister, “Hyperbaric Oxygen Therapy,” available at <http://emedicine.medscape.com/article/1297731-overview>.

² Marian S. McDonagh, *et al.* “Systematic review of hyperbaric oxygen therapy for cerebral palsy: the state of the evidence.” *Developmental Medicine & Child Neurology* 2007;49(12):942-7.