

SHOULD WE TREAT CEREBRAL PALSY?

by Kenneth Capek RRT, CHT, MPA



The best source of supportive information examining the topic of treating cerebral palsy (CP) with hyperbaric oxygen therapy (HBOT) is a book called "Hyperbaric Oxygenation for Cerebral Palsy and the Brain-Injured Child," was written by Dr. Richard A. Neubauer (Best Publishing 2002). Dr. Neubauer is one of the leading proponents for using HBOT in the treatment of neurological disorders since 1972. He has treated over 2,000 patients whose various diseases and neurological conditions have been improved with HBOT. He is the founding President of the American College of Hyperbaric Medicine, an author of more than 45 published papers on HBOT and lectures throughout the world on the subject.

Brain injury can be caused by external physical force, bleeding within or around the brain, lack of oxygen to the brain or toxins passing through the brain blood supply. There can be temporary or permanent impairment of cognitive, emotional, and/or physical functioning. In cerebral palsy there is motor function involvement seen usually at 2 years of age. There is no cure for Cerebral Palsy. Treatment of CP is centered on providing medication to control seizures, along with surgery and rehabilitation for improving motor skills. Cerebral palsy is frequently caused by hypoxia before, during or shortly after birth. Dr. Neubauer's theory about CP is that when neurons or nerve cells in the brain are cut off from oxygen, some may selectively shut down electrical

functions to save energy. If at a later time these cells obtain the oxygen they require, they will literally "turn back on". He states that, "the goal of HBOT is to reactivate cells in the child's brain that are alive but non-functional, and assist the child in recovery from some of the damage". He believes early intervention improves results and for those cells that are awakened new training or even retraining may be necessary. Dr. Neubauer's "Idling" neuron theory describes some of the neurons in the brain as dormant, but may be "alive for as much as 14 years. He clarifies that the proper name for this recoverable brain tissue is the "ischemic penumbra". The penumbra is found in the area around the core of dead cells. These cells are not working to full capacity, but still have viable neurons waiting to be reactivated. Dr. Neubauer explains there is scientific evidence based on SPECT (single photon emission computed tomography) scans that HBOT can "awaken" these dormant cells. SPECT scans are a diagnostic nuclear medicine procedure that can provide a cross section of the brain, as in a cat scan, but demonstrates blood flow patterns in the organ and thus a window to metabolism. SPECT scans performed before and after HBOT can prove that there are recoverable brain cells. The initial scan gives a baseline to demonstrate change and progress. If no "idling" or dormant cells are discovered on the scan, HBOT may not help. Unfortunately not every child will demonstrate improvement after HBOT, although the documented improvement rate is approximately 85%. There is a correlation between a positive SPECT scan and physical improvements in 80%-90% of the cases. These improvements include motor functions, such as muscle contractions for swallowing and/or ability in walking. Another important benefit is the reduction and/or elimination of seizures commonly found (about 50%) with children who have cerebral palsy.

Although everyone seems to agree more studies are needed, there are some studies and a large volume of anecdotal evidence pointing to improvements in CP patients. When one reads the many individual cases that are reported it is hard to consider not treating these patients. It doesn't seem compassionate or fair to be denied a treatment that could help a child simply due to the lack of studies yet much of medicine does not have this evidence-based support. Only 17% of Medicare insurance reimbursed conditions have been documented in scientifically proven double-blind studies. It seems that different therapies are held to different standards of proof by the medical community.

There are many cases described in Dr. Neubauer's book, such as Rebecca, who was pronounced brain dead after birth, yet survived when the ventilator was removed. Being a severe CP case, one of her major problems was the inability to swallow anything but thickened liquids. After only six HBOT treatments, she could swallow any liquid, even water. The caregiver reported that this response was greater than any seen in the past 4 years of speech and feeding therapy. In addition, her movements were much more controlled and smooth. Jason was diagnosed with CP after birth. At age seven he could barely speak or walk. After 61 treatments he could walk with assistance along with

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other improved motor and cognitive skills. I can imagine if I were the caregiver to this special patient, that any change at all would be seen as progress and worth the time and cost. The effect of "caregiver burden" as a measurement outcome of treatment was not a criterion in the studies examining HBOT and cerebral palsy, although this was highlighted as a beneficial outcome among study participants. As stated in the Agency for Healthcare Research and Quality (AHRQ) report within the section that follows, "patients and caregivers value any degree of benefit from HBOT. What may be seen as small in terms of a study criterion may actually have a significant impact on caregiver burden or quality of life".

The recommended protocol for administering hyperbaric therapy for cerebral palsy is to use pressures of 1.5 to 1.7 ATA (1.1 to 1.5 for children who suffer from seizures), This is considered a very low pressure in relation to other common HBOT protocols. The number of treatments may be 40 or more. Dr. Neubauer's philosophy is to "treat until no further improvements are noted".

For the argument against treatment of cerebral palsy with HBOT we must first examine the position of the Undersea and Hyperbaric Medical Society (UHMS). This organization was founded in 1967, as a voluntary professional medical and scientific organization whose primary purpose is to determine appropriate indications for HBOT. The UHMS states, they "monitor and regularly review the published medical literature for reports on HBOT, in an attempt to provide guidance to the medical community as to those conditions that are likely to benefit from hyperbaric treatment." If the evidence is determined to be sufficient, the UHMS will recommend placement of the condition or disease on their list of approved indications for HBOT. The UHMS is not a regulatory agency and their "recommendations are intended as guidance".

The UHMS reviewed case reports, case series and one prospective randomized trial. Their position is that, "while the results from these case reports and case series tend to suggest a beneficial role for HBOT in chronic brain injury, the prospective trial, which examined the effect of HBOT on children with cerebral palsy, found no benefit of HBOT treatment. Since prospective randomized trials are generally accepted to be the most reliable form of clinical research, the weight of the currently available scientific literature is not felt to support an endorsement of HBOT for chronic brain injury."

Another "formal, objective review" of the available published literature regarding HBOT and CP was performed by the Oregon Health and Science University (OHSU) Evidence Based Practice Center, which was funded by a grant from the US Agency for Healthcare Research and Quality (AHRQ). In brief, the agency concluded, "There is insufficient evidence to determine whether the benefits of hyperbaric oxygen therapy (HBOT) outweigh the potential harms in patients who have traumatic or non-traumatic brain injury" (Cerebral Palsy). They also could not find sufficient evidence to determine whether the use of HBOT improves functional outcomes in children with cerebral palsy. They state that the results of the only "truly randomized trial were difficult to interpret because both study groups improved. They also saw problems with the only other controlled study because there was a 6-month delay in treatment and the placebo group also showed improvement. They found "sharp disagreement in the medical literature over the validity of these experimental models".

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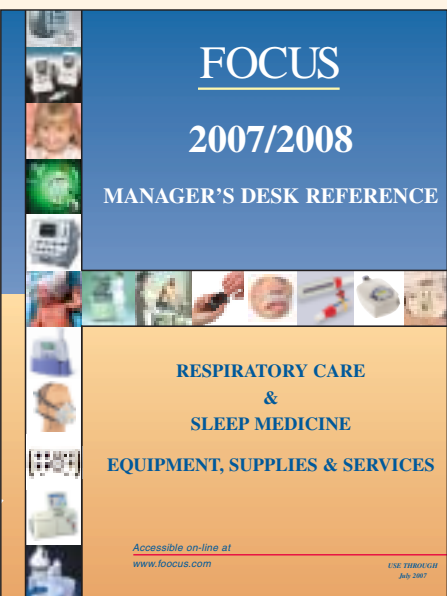
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plug off your left anterior descending coronary artery, will it matter to you whether the doctor who is about to crack your chest is fully credentialed? You bet your sweet bippy it will (my compliments to Rowan and Martin), or at least it should. To my many friends and colleagues who never bothered to go ahead and get the advanced practice credentials, I say... "Absit Invidia" (hint, it's Latin)

Think about our little charges in the NICU. Aren't they altogether precious? Don't they deserve staff with the highest level of training and preparation? I realize that many departments have no financial incentive for you to acquire these credentials. And they do cost you a few hundred bucks to complete. But by way of comparison, the cost of taking the RRT exams is not much more than the cost of a high end MP3 player or what you have probably paid in late fees for video rentals for a year.

The 1995 AARC Human Resources Study reported that in 1992, 37% of respondents reported having an RRT, and that this rose to 80% in 2005. The percent of all practitioners reporting holding an NPS credential rose from 9% in 2000 to 15% in 2005. Go and get your RRT and your NPS. You will probably feel much better about yourself professionally. It is the right thing to do.

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Why do people love this conference? Perhaps it's for the same reason that the world loves reality TV. The attendees soon find out that the Focus family is made up of everyday caregivers and managers just like themselves. Every aspect of the conference is constructed for the people by the people and for that reason, it relates so well to the rank and file caregivers. No "stuffy" or "out of touch with reality" content here. No hint of a "hotsy totsy" inner circle at work. This is real world stuff served up by real world people. The forty or so therapists who work their butts off putting this conference together clearly do it for the love of the game and have no problem saying so.

Health care providers are challenged not only to maintain their skills but to elevate them as well. Continuing education, whether it's mandated by licensure or intrinsic need, is the primary way we all work towards this goal. The most education-minded among us will plan for our needs well in advance and we'll look for a venue where top-drawer lectures, professional networking, personal affirmation and fun prevail. We'll find all that and more at Focus. See you in Nashville in '08.

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Dr. Neubauer's theory of re-directing blood flow was also addressed. They acknowledge that in the field of cardiology this principle of redirecting flow toward ischemic areas can help damaged tissue recover is accepted but in the area of critical care medicine, "drugs and maneuvers that redirect flow to ischemic organs (e.g., brain and kidney) do not always improve recovery at the cellular level. For this reason, improved blood flow must be linked to other measures of cellular and organ recovery". They also looked at Dr. Neubauer's use of SPECT scans and stated that this testing needs more good-quality studies to validate it for assessing the effectiveness of HBOT in cerebral palsy. They noted that "like all other diagnostic tests, SPECT scans have a measurable false positive and false negative rate in relation to clinical outcomes".

The final summary statement of the UHMS asserts that this topic warrants continued monitoring. "The UHMS supports the continued performance of well-designed clinical trials in this area, especially those that are prospective, randomized, and controlled. If sufficient convincing data demonstrate that HBOT treatment is associated with favorable risk-benefit and cost-benefit ratios for the chronic sequelae of traumatic or non-traumatic brain injury, the UHMS will endorse application of hyperbaric therapy for the specific supported indications. The Society feels that there is insufficient supportive evidence to warrant such an endorsement at present." Meanwhile, there is no insurance reimbursement for using HBOT for cerebral palsy and few centers that will even treat these cases. Most centers only treat UHMS approved indications. More detail from the reports discussed can be found at the following two sites. Find the Undersea and Hyperbaric Medical Society Position Statement of 2003 at; <http://www.uhms.org/POSITIONPAPERS/position%20papers.htm>

Find AHRQ report at; <http://www.ahrq.gov/clinic/epc-sums/hypoxsum.htm> *Hyperbaric Oxygen Therapy for Brain Injury, Cerebral Palsy and Stroke.*

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