

What You Should Know in Emergency Situations

Excerpt from "The Oxygen Revolution" by Paul G. Harch, MD and Virginia Mccullough

Although I wish I could reassure you about the availability of treatment in emergency settings. I can't do so at this time. But I can offer a reason why research can both help and hinder your quest for treatment, particularly if you are seeking HBOT for acute severe traumatic brain injury. Multiple studies in animals and humans, including metabolic studies, which look at various blood markers that measure metabolism, such as the way the body uses glucose, and studies that measure intracranial pressure or swelling, have now shown that HBOT in acute severe traumatic brain injury can significantly reduce mortality. Yet, HBOT is not routinely or frequently used in these cases, in part because the reviews have been inadequate and in some cases, suppressed.

In 1992 results of the Rockswold study of acute severe traumatic brain injury were released. These results showed that the group of patients who did not receive HBOT had a 150% increased chance of dying compared to those who received HBOT. This is an astounding figure, and one would have thought that cable news shows would have been filled with stories about this great advance in emergency medicine. However, the study results were cast in a negative light that generated a non-scientific moral judgment. Specifically, the results were dismissed essentially because researchers had not found a greater percentage of patients in the hyperbaric group in the "good outcome" category, even though there was a highly significant reduction in death if you received HBOT.

Sadly, the "good outcome" category was defined as the highest functioning group, those patients who at least potentially could return to work or to a nearly normal lifestyle. But remember, these patients suffered severe brain injury; many were close to death. It was ludicrous to expect these patients to fully recover from these significant brain injuries and once again function at their pre-injury level. The fact that so many more within the control group died speaks to the severity of their injuries.

What should be shouted from the rooftops is that so many were saved- it was a monumental scientific achievement that had great implications on a human level. In almost no other area of medicine is saving life and reducing mortality disparaged or discounted. Frankly, the way the article was interpreted, hyperbaric oxygen saved a bunch of severely brain damaged individuals who would become a drag on the medical system. Hence, we saw a moral judgment that we should not apply a therapy that saves a group of non-productive, non-functional, high expense individuals.

But it's not up to the medical profession to make this kind of a moral and financial judgment. It's simply not their place to decide what degree of recovery is "worth it" or "acceptable." Families make these decisions, and ultimately, society in general is involved. And, speaking as a doctor, it is not up to me to define your good outcome, or as I've said in this book, your miracle. My job is to offer the best treatment options I'm aware of and supply scientific evidence to make informed decisions.

The families of those who were given hyperbaric oxygen therapy and survived at least had the possibility of a continued relationship with their loved one on some level. In addition, these surviving patients also had the opportunity to receive other therapies that could help them improve- advance them to higher levels of functioning. They are also

candidates for new therapies that may be developed or discovered some years into the future from which they may benefit at that time. Death precludes all those options.

Based on what we currently know, we can't measure outcomes from traumatic brain injury and stroke at one year. Rather, the brain continues to develop, remodel, and improve for years and years after the injury. So, had they been followed over a period of years, the group receiving HBOT may have gone on to function at higher levels than the control group. Since I have seen this long-term improvement in patients myself and treated hundreds of them years after their injury, I know this is possible.

I mention the Rockswold study because it is an example that tells us the monumental effort involved in reversing worn out attitudes and inadequate reviews about HBOT for acute severe traumatic brain injury. These attitudes have developed over the last 30 years and are entrenched in much of the neurological medical community, but among some in hyperbaric medicine, too.

What's important here is that the Rockswold study was not a single isolated study. In the 1970's, the Germans had shown that the pressure of HBOT subsequently adopted by Rockswold had a beneficial effect on brain metabolism in 30 patients with either severe traumatic brain injury or severe stroke. They followed this article with a randomized prospective controlled trail, the "holy grail" of medical research, like the Rockswold study on patients with traumatic mid-brain syndrome. A similar study was done in France with positive results in the younger group who received HBOT.

A mid-brain syndrome patient is one whose mid-brain and lower structures are the only working portions of the brain, these patients are in a coma on a ventilator with no response to any stimulation. Essentially, this is the identical type of group in Rockswold study that had such a good response to HBOT. The Holbach study also showed *the same 60% reduction in mortality in the HBOT group or 150% increased chance of death in those who did not receive HBOT.* Moreover, the ones who lived had better outcomes than the non-HBOT group. Dr. Rockswold (a neurosurgeon, not a hyperbaric physician) couldn't believe Holbach's results were true, so he wanted to do the definitive study to confirm Holbach's findings-and that's exactly what he did.

Let's belabor the point just a bit more. Subsequently to Holbach and Rockswold, Dr. H. Ren in China duplicated both of these studies and found, you guessed it, the same 60% reduction in mortality in the HBOT group, and 150% increased chance of death in the non-HBOT group. Four countries, four studies, four nearly identical outcomes.

Finally, in 2001, Dr. Rockswold went back and did some more fine-tuning and found that a single HBOT in acute severe traumatic brain injury had a profoundly positive effect on the damaged brain's metabolism that had never been recorded in the history of science and medicine. Rockswold concluded that HBOT should be delivered as soon as possible after severe traumatic brain injury. Sadly, this has not happened. So, why aren't we using HBOT in acute severe TBI-traumatic brain injury?

Well, in 2001, Dr. Duncan, DR. Neubauer, and I met with Dr. John Eisenberg, the director at Medicare's Agency for Healthcare Research and Quality, the evidence arm of Medicare that makes recommendations on reimbursement for new therapies. Dr. Eisenberg commissioned a study of the scientific literature on HBOT in neurology. I was invited to be a peer reviewer and consultant to the project and sent the study investigators at the Oregon Health and Science University's Evidence Based Practice Center 14 FedEx boxes with literature from my files.

Unfortunately, the conclusion reached, now known as the AHRQ Report, was based on misinterpretation and misunderstanding of all of the literature I just cited above. Furthermore, the main authors of the commissioned study didn't have the credentials or scientific back-grounds in hyperbaric medicine and brain injury neurology to properly interpret the literature based on its science. In August 2004 the traumatic brain injury component of the AHRQ report was published in the Archives of Physical Medicine and Rehabilitation. In a Letter to the Editor finally published in April, 2006 titled "Medicine That Overlooks the Evidence" I pointed out how the authors of the AHRQ study ignored the science and came to their inaccurate conclusion.

Meanwhile, the Hyperbaric Oxygen Committee of the Undersea and Hyperbaric Medical Society rejected my application in 2001 to have acute severe TBI added to the vaunted 13 "accepted indications" list, citing the need, initiated that day, to change the manner in which they score and approve new indications. Acute severe TBI just happened to have one of the highest scores of any of the 13 accepted indications in terms of scientific evidence.

The point of all this discussion, which is rather boring until your loved one has an acute TBI and is in danger of dying, is that the scientific evidence supports the use of HBOT in acute severe TBI to save lives. Period. However, a badly flawed "evidence-based medicine" review by primary authors with pharmacy and bioinformatics degrees enters the picture, along with a rejected based on "rules change" and politics by a committee whose decisions affect reimbursement. These flaws are no minor matter. At this point, they mean that you cannot obtain HBOT for your acute severe traumatic brain injury, even when it decreases your chance of dying by 60%. This comedy, or rather, "tragedy" of errors and misinterpretation and misunderstanding of the science- and its implications- leads me to one very important conclusion: *The medical profession at the institutional level cannot be trusted to act in the public's best interest medically when it comes to making scientific decisions that determine reimbursement for medical care. It is time for the lay public to be brought into the medical reimbursement decision-making process.*

The other reason why the lay public needs to have a deciding voice in medical reimbursement has to do with the hyperbaric medicine specialty itself. I've talked about the boom-bust cycles of HBOT, in large part due to over-optimism and "amazing" claims, coupled with inadequate definition and understanding of HBOT. It also has been a medical orphan at times, lacking adequate protection and defines, so to speak, even by its practitioners. For example, the Hyperbaric Oxygen Committee of the Undersea and Hyperbaric Medical Society has no current neurologist or neurosurgeon member and has had neither since 1986. How can you defend, let alone promote, HBOT for neurological applications if you have no one with special knowledge or experience in this field? You can't. Furthermore, the curious political climate in the hyperbaric medicine field had held back the therapy and kept it from advancing into neurorehabilitation.

While I won't go into this detail, personal, non-medical issues within the hyperbaric medicine field itself have been at the root of the lack of advancement of HBOT in neurology for the past 30 years. Unfortunately, these influences continue to this day, although they are slowly waning as a result of- for lack of a better term- "the natural order of things." In fact, this reminds me of a quote from the famous quantum physicist Max Planck when he was dismayed by the lack of acceptance of his and Einstein's

proofs: “Science progresses funeral by funeral.” While I’m no Einstein or Planck and this not rocket science, my problem is that you, your brain-injured loved one, and I cannot and should not have to wait for the doctor to die in order for the science to advance! We need it yesterday.

Finally, I believe the lay public is at least vaguely aware of the “culture of medicine,” meaning that doctors allow long-held assumptions within their fields, and personality issues, too, to influence attitudes toward treatment. Until recently, medical information and the profession itself existed as a relatively insular world. However, all of this has changed. The internet alone, not to mention cable news networks and a plethora of science and health channels, have made it possible for everyone to access scientific literature. No longer is vital medical information sequestered or made inaccessible even to those in another medical specialty. The entire public can read and review articles. This will help move HBOT, and other therapies, into the mainstream.