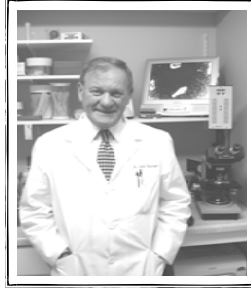

From the Editor's Desk

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Dr. Jack Kessinger

On November 12, 2009 I HAD A STROKE

Twenty minutes past eight AM, on a typical Wednesday morning, as I was washing my hands, I experienced a very weird sensation, somewhere between faint and woozy. The spell lasted only a very few seconds. On the way back to the kitchen area I picked up three Townsend Letter Journals to glance at while Virginia prepared our morning "smoothie." Almost as soon as I sat down another unwelcome woozy attack began. This one was stronger than the first, and I felt myself losing control. When I reached to take my glasses off I found my right hand was not taking directions very well. I stood up and began walking (unsteadily) toward Virginia and told her I felt strange. She sat me back down and began rubbing my face with a cold cloth and asking "What was the matter?" I told her I didn't know. The spell subsided and I decided to lie back down for a while. Before we got to the bedroom another spell began, so I rested on a chair in the living room. That spell soon subsided and I did make it to the bed. After a few minutes I felt better, got up and dressed. Virginia and I decided to reschedule patients for that day. Then the big one hit. I lost use of my right arm, leg and speech. Our son and associate, Dr. Jay, brought the wheel chair. Virginia called our clinic and told the staff that if anyone was in the hyperbaric chamber to get them out because, we were on our way.

From the time of the first insult until I was in the chamber was not much more than an hour. After only a few minutes in the chamber I temporarily regained partial use of my right arm and leg. I was elated, albeit briefly, because I soon lost its use again. After an hour under pressurized oxygen I was taken out of the chamber and given first a vitamin C IV, followed by an EDTA IV.

About four hours later I began to experience limited movement of my fingers, followed by movement of my right arm and leg. The ability to move continued to wax and wane for the rest of the day. By about four PM, and being closely observed by Virginia and staff, I

was able to walk unsteadily down the hall for another treatment in the chamber. The use of my right arm and leg continued to slowly improve over the next several days. Later that evening I was able to comb my hair and brush my teeth using my right arm, but it was a real challenge. The next morning shaving was another challenge.

Following the attack, I have had more than 14 dives in the chamber. For the first 7 days following the attack I had a daily vitamin C "cocktail" IV piggybacked with EDTA chelation IV. I have now regained full use of my arms, legs and speech. After two weeks I began to resume exercise by walking daily on the tread mill. I plan to start doing some weights on week four. My speech has also returned to a near normal (at least normal for me).

Branston (et. al., 1974) reported that in brain trauma, including oxygen inhibition, glucose is utilized much more rapidly as a protective mechanism, in order to help maintain homeostasis. For a short period of time, this mechanism is reported to help minimize nerve tissue damage, until oxygen can be restored. Following my first dive in the hyperbaric oxygen chamber, my blood pressure was 192/90, with a fasting glucose (by finger stick) of 125 (normally less than 100).

If oxygen cannot be restored within a very short period of time (two to four hours) following a stroke, permanent paralysis will ensure. This is where the hyperbaric oxygen therapy (HBOT) comes into play for stroke victims. Oxygen is a natural gas that is absolutely essential for life and healing. Oxygen under pressure floods the liquid plasma of blood with oxygen and penetrates parts of the body where arterial flow is hindered, including cerebral spinal fluid. HBOT not only protects the brain against ischemia/hypoxia but also counteracts edema associated with stroke.

The first suggestion that raised air pressures might be useful in the treatment of human illnesses was made in 1664 by Henshaw in England. Only since 1977 has the concept of healing by pressurized oxygen gained attention. The air we breath is 21% oxygen. The oxygen concentrator we use produces 93% oxygen, and the chamber is pressurized at 1½ times atmospheric pressure. This is the same pressure as would be exerted at thirty to forty feet underwater. This concentrated and pressurized oxygen saturates the body's tissues and plasma.

HBOT decreases swelling in brain tissues, relieves hypoxia, improves micro-circulation and reduces spacticity. The improvements seen in patients have been reproduced in hyperbaric centers worldwide. Clinical and electroencephalographic (EEG)

(Continued on next page)

improvements were shown in both early and chronic post-stroke patients by Holbach and coworkers (*Stroke* 1976;7:296-300).

The tissues surrounding the localized non-functioning area of the brain, caused by ischemia, also start to become hypoxic. This area is referred to as the ischemic penumbra. The penumbra contains dormant cells that are intact, but nonfunctional. They are often referred to as idling cells. The most important factors in a stroke victims recovery is the extent of the infarct and of the penumbra. HBOT has been shown to recover much of the penumbra (idling) neurons, and offers a much more optimistic outlook for stroke patients. Several studies have been reported in various scientific journals showing significant improvement for stroke victims with HBOT. It is rare for a stroke victim to get HBOT treatment within the first few hours. Most HBOT studies reported are from stroke victims that suffered the attack months, or even several years following the event. In 1990, research published in the *Lancet* found that cells in the penumbra of a 60 year old stroke victim, that had been idle for 14 years, were recoverable with hyperbaric oxygen therapy (Neubauer RA. Et. al., *Enhancing "idling" neurons. Lancet, 1990;335:542*).

Richard A. Neubauer MD, is a leading researcher utilizing HBOT and stroke victims. In his book, *Hyperbaric Oxygen Therapy*, he states that one third of those who suffer a stroke do not survive the initial attack, and another one third end up in assisted living facilities. Only one third improve, and many of these patients are left with disabilities that hinder their ability to resume pre-stroke status.

Case Study: A 74 year old stroke victim presented in our clinic in September requesting HBOT therapy. He had experienced a stroke two years ago and had studied the advantages of Hyperbaric Oxygen therapy. He came in on a walker, barely mobile (with the assistance of his wife). He was easily agitated and confrontational. After his second session, he was able to roll the walker on his own. On his third visit, he brought the walker in and lifted it, to show our staff how much strength he was gaining. He seemed to be gaining mentally also. He was pleasant and cooperative with our staff... and his wife. The fourth visit was without the aid of the walker. This patient received 20 one-hour sessions in our HBOT and finished treatment with a slight limp in one leg. He has regained his physical strength and enjoys a clear mind.

Documenting the effectiveness of HBOT through double blind placebo studies in the case of stroke victims has an ethical dilemma. As most health care facilities are devoted to patient care, rather than

doubling as a research institution, each patient's treatment is optimized according to the attending physician's judgment and the patient's circumstances. Thus, most studies concerning stroke victims are observational. However, the once-firm line between mainstream and alternative medicine continues to blur giving increased credence to clinical studies. New clinical anecdotes are emerging in the field of hyperbaric oxygen therapy. Some physicians now report success for HBOT treating numerous health conditions, including stroke, cerebral palsy, autism (and other neurological injuries), athletic injuries, diabetic ulcers, etc...

West Germany has long recognized the effectiveness of HBOT in stroke rehabilitation to the extent that all stroke patients receive a three-week intensive course of hyperbaric oxygen, and this care is reimbursed by the insurance companies.

Two days after my event, Friday, 11/14/08, I had a non-contrast MRI. The radiology report for the MRI showed an 8 mm focus of abnormal signal in the posterior limb of the left internal capsule most consistent with an acute ischemic insult. On conversing with the radiologist, they seemed surprised that there is no apparent lasting paralysis.

A follow-up non-contrast MRI ten days later, on 11/24/08, shows no new restricted diffusion changes or diminished apparent diffuse coefficient (ADC) values, and the previous ADC values have decreased (increased ADC values would indicate some residual damage). No signs of hemorrhage or new lesions were identified.

I am satisfied that if I had been taken to a hospital the outcome would have been quite different. The only drug approved by the FDA for treatment of acute ischemic stroke is a thrombolytic agent called tissue plasminogen activator (Tpa). Eighty percent of strokes are caused by ischemia with twenty percent being hemorrhagic. A thrombolytic agent in a hemorrhagic stroke would be not only ineffective, it would increase the severity. Therefore, a hospital would have required a battery of tests and examinations necessary to differentiate between an ischemic or hemorrhagic stroke. On the other hand HBOT treatment can begin immediately for either an ischemic or hemorrhagic stroke. R.A. Neubauer, et. al., reports it is their impression that hemorrhagic strokes respond better to HBOT treatment than thrombolytic ones. It appears that with either type stroke HBOT is a safe bet.

