



Ocean Hyperbaric Neurologic Center

RICHARD A. NEUBAUER, M.D., MEDICAL DIRECTOR

PRESIDENT

Richard A. Neubauer, M.D.
Medical Director
Ocean Hyperbaric Neurologic Center

BOARD CHAIRMAN

Franz Gerstenbrand, M.D.
Professor of Neurology
Vienna, Austria

BOARD OF ADVISORS

Hansdetlef Wassmann, M.D.
Professor of Neurosurgery
University of Muenster (Germany)

P.B. James, M.D.
Senior Lecturer
University of Dundee (Scotland)

Dr. Alan Kochi Nui M.D. Ph.D
Dept. of HBO Therapy
Chi-Mei Foundation Hospital (Taiwan)

Pier Giorgio Data, M.D.
Professor of Hyperbaric Medicine
Cheitì State University (Italy)

Sergei Efouni, M.D.
Hyperbaric Medicine Consultant
Russia/Brooklyn, New York

Pierre Marois, M.D.
Pediatric Physiatrist
Sainte-Justine University (Canada)

Dr. William Maxfield
Radiologist
Manatee Diagnostic Center
Oceasa, Florida

Xue Lianbl, M.D.
Director, Hyperbaric Oxygen Dept.
Beijing Tiantan Hospital (China)

E. Cuahemoc Sanchez, M.D.
Medical Director
Medicina Hyperbarica (Mexico)

Jane Orient, M.D.
Executive Director, American Assn.
Of Physicians & Surgeons

Charles Golden, Ph.D.
Professor of Psychology
Nova Southeastern University

Robert Moffit, Ph.D.
Director of Domestic Policy Studies
The Heritage Foundation

Yehuda Melamed, M.D.
Director of Hyperbaric Medicine
Rambam and Elisha Hospitals (Israel)

Dr. Arun Mukherjee
Medical Director and Founder
FSMHP-UDAAN Multimode Therapy (India)

Friday, April 27, 2007

To Whom It May Concern,

I have known, admired and collaborated with Ray Cralle for the past twenty-five years*. Ray is one of the finest and most competent physical therapists in the traditional realm of the field as well as being one of the most innovative, imaginative and forward thinking, particularly in the treatment of brain injury. His techniques have revolutionized the neurorehabilitation of thousands of our patients treated concomitantly with hyperbaric oxygen and his unique and standard modalities of physical / occupational therapy and neurocognitive stimulation.

I have specialized in the treatment of brain injury with hyperbaric oxygen for the past 35 years. I recognized early in my research that a multi-disciplinary approach to brain repair was essential and that as brain cells were recovered with hyperbaric oxygen they must still be redirected to form new myoneural pathways. In both the acute and chronic brain injury, one of the most important mechanisms of recovery is plasticity: the reeducation of neurons and neuronal connections to improve both cognitive and motor skills. Following any brain injury there is an inherent period of plasticity while the brain and body compensate and attempt to overcome and rewire their connections to learn to take over the tasks of the damaged brain cells. Hyperbaric oxygen, by significantly increasing oxygenation and reestablishing blood flow to the injured brain enhances plasticity in the acute phase and reawakens this natural repair mechanism in chronic brain injury.

Hyperbaric oxygen is a simple concept that obeys all of the gas laws of physics. It involves the administration of 100% oxygen at greater than atmospheric pressure in a specialized hyperbaric chamber. Under normal pressure, oxygen is only transported throughout the body by the hemoglobin

* His mother, Ruth, was a patient of mine and an amazing woman; one of the first female physical therapists in the United States at a time when a professional woman was a rarity. Obviously, great talent runs in the family.

A CENTER OF EXCELLENCE

4001 Ocean Drive | Suite 105 | Lauderdale-by-the-Sea | Florida 33308 | Telephone: 954.771.4000 | Facsimile: 954.776.0670 | Email: info@oceanhbo.com

Dedicated to the Ethical & Scientific Expansion of Hyperbaric Oxygenation in Neurology

www.oceanhbo.com

or red blood cells. Therefore, any area of the body that is receiving little or no blood flow is hence receiving little or no oxygen. This can have devastating effects, especially to the brain, which although comprising only 2% of the body's weight, requires 20% of the total body's oxygen consumption. When 100% oxygen is delivered under increased pressure, the inhaled oxygen is perfused through the lungs and by virtue of the pressure phenomena is dissolved into all body fluids including a 2000% potential increase in plasma oxygenation. More importantly it is also dissolved into lymph, intracellular fluid and cerebrospinal fluid, which surrounds and nourishes the brain and the central nervous system. This oxygen can now reach brain cells, bone and tissue which are inaccessible to red blood cells, enhance white blood cell function and promote the formation of new capillary and peripheral blood vessels.

In almost all brain injuries, irrespective of cause (traumatic, vascular or ischemic), there may be areas of irreparable damage. Because the blood flow, and thereby oxygen, and glucose are not perfused from these damaged cells to the cells surrounding them, it causes these cells to swell and become non-functional reducing blood flow and glucose to the cells surrounding them. This is a vicious devastation that has been likened to the epicenter and periphery of an atomic bomb blast; the further away from the center of the insult the more there is a possibility that some of these cells may be recoverable. These areas of the brain are well known as the ischemic penumbra which is comprised of brain cells that are receiving just enough oxygen and glucose to survive but not to fire electrically or to function. Often these penumbral zones are far greater in volume than the actual area(s) of permanent damage. It is these marginal, dormant cells that can be reactivated by increased oxygenation in a hyperbaric chamber.

The synergy of brain / body repair now becomes essential. Not only can the brain repair the body but the body can facilitate the reparation of the brain through physical and sensory input by systematically teaching the central nervous system and the brain to learn new or better ways to move, balance and coordinate. It challenges the brain to form new networks, bypassing damaged cells to compensate, coordinate and accommodate new physical skills. This stimulus also activates the function of the dormant

A CENTER OF EXCELLENCE

4001 Ocean Drive | Suite 105 | Lauderdale-by-the-Sea | Florida 33308 | Telephone: 954.771.4000 | Facsimile: 954.776.0670 | Email: info@oceanhbo.com

Dedicated to the Ethical & Scientific Expansion of Hyperbaric Oxygenation in Neurology

www.oceanhbo.com

damaged cells, as it increases blood flow and oxygenation throughout the body, thus provoking further brain function.

In 25 years of business, personal and professional experience with Ray Cralle, I can honestly say that he is one of the most honorable men I have ever encountered. His desire now to expand his practice to incorporate hyperbaric oxygen to treat one of the most neglected populations of our patients, those with brain injury, is beyond commendable. These are the patients who have been told that given the standard medical paradigm, nothing can be done. In fact, research into the field of neurorehabilitation in chronic brain injury is almost non-existent. Of particular relevance is the treatment of cerebral palsy and the brain injured child, wherein the synergy of hyperbaric oxygen and physical / sensory neurorehabilitation often has a very profound effect. In these children, when the brain is still in development and the natural mechanism of plasticity is ongoing, the combination of increased oxygenation, new capillary formation to the brain and Ray's innovative techniques of therapy, we are seeing children who may likely have required some level of supportive care all of their lives become fully physically functional cognitive young men and women.

It is with great enthusiasm that I welcome Ray Cralle to join me in furthering the highly promising field of hyperbaric oxygen for neurologic injury. His talents and insights will have a major impact on the lives and well being of many patients and families.

Sincerely,

R.A. Neubauer, M.D.

Richard A. Neubauer, M.D.

Medical Director, Ocean Hyperbaric Neurologic Center

A CENTER OF EXCELLENCE

4001 Ocean Drive | Suite 105 | Lauderdale-by-the-Sea | Florida 33308 | Telephone: 954.771.4000 | Facsimile: 954.776.0670 | Email: info@oceanhbo.com

Dedicated to the Ethical & Scientific Expansion of Hyperbaric Oxygenation in Neurology

www.oceanhbo.com