

## **High Dose Omega-3s in Severe Brain Injury**

### **Brain Health Education and Research Institute**

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There is no way to know if omega-3s will help in the particular situation for which you are seeking information. Clinical experience tells us the brain needs to be saturated with high doses of omega-3s in order to have the opportunity to heal. Nowhere is this truer than when the brain has been severely injured by trauma or anoxia (lack of oxygen to the brain). Omega-3s are the nutritional foundation of the brain and without an optimal supply, the brain is less likely to be able to heal. Omega-3s are not a drug and not a cure. Every situation is different and some patients may respond better than others. However, there is no downside to providing optimal levels of nutrition in order to give a patient the best opportunity to regain as much function as possible.

Many doctors believe not much can be done for brain injured patients and they can be very reluctant to try anything that is out of the ordinary. Often, families are told their loved one is in a persistent vegetative state and there is no hope to change the situation. When a family suggest high doses of omega-3s or other “alternative” or “complementary” therapies, doctors often resist using such therapies because the lack of evidence in the scientific literature even though there is little or no downside. Additionally concerning omega-3s, doctors sometimes cite that omegas could cause internal bleeding or a stroke even though there is not a single clinical study in the scientific literature that has ever shown this to be of any clinical significance. Yet doctors will have most bedridden patients on potent blood thinning pharmaceuticals (e.g., heparin, Coumadin, warfarin) that completely block the blood’s ability to clot and are well known to put a patient at risk of bleeding or stroke.

Always keep in mind that the family needs to be the patient’s biggest and most vocal advocate. Doctors, nurses, and administrators go home after their shift and have no emotional attachment to the patient. Sometimes that means the family has to be aggressive to get the medical system to make things happen. If you, the family, believe that using a natural substance that is the nutritional foundation of the brain is the right thing to do, you need to express this to the doctors and nurses and make this happen. It is your loved one’s life that is at stake; to them, it is just another patient.

The next page is intended to be available to print and give to the doctors if you believe omega-3s may be beneficial to give your loved one the best opportunity to regain as much function as possible. Please keep in mind, brain injuries, whether from trauma or a lack of oxygen, are devastating injuries, and a full recovery is often not a realistic expectation. If omega-3s are used in your case, please let us know how it goes. Feedback is very important so we can continue to learn what works best so we can continue to help raise awareness of nutritional therapies.

## Use of High Dose Omega-3 Nutrition in Severe Brain Injury

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Tremendous advances have been made in surgical and intensive care unit (ICU) management of brain injuries, including maintaining adequate oxygenation, controlling intracranial pressure (ICP), and ensuring proper cerebral perfusion. These advances have resulted in reduced mortality, particularly in traumatic brain injury (TBI). However, the secondary injury phase of brain injury, whether traumatic or anoxic in origin, is a prolonged pathogenic process (days to weeks) characterized by neuroinflammation, excitatory amino acids, free radicals, and ion imbalance. There are no approved therapies to directly address these underlying metabolic processes. Other than time and hope, there is nothing else modern medicine has to offer the severe brain injured patient in a comatose state.

The Brain Health Education and Research Institute was founded by Michael Lewis, MD, MPH, MBA, FACPM, following his 31½-year career in the U.S. Army. Colonel (Retired) Lewis was the DOD's subject matter expert on omega-3 use for the prevention, treatment, and rehabilitation of TBI and continues to work with the DoD in this area. His theories started with a simple concept: if omega-3s are essential to build a fetal brain in utero, shouldn't they be essential to rebuild a brain when damaged like you would use bricks to repair a brick wall? Omega-3 fatty acids, particularly Docosahexaenoic Acid (DHA), are literally the bricks of the neuron cell wall. The Society of Critical Care Medicine publishes Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient << <http://www.ncbi.nlm.nih.gov/pubmed/19398613#> >> and the only two Grade A recommendations are about using immune enhancing enteral formulations including omega-3s.

Animal models and now clinical experiences show the use of optimal amounts of omega-3s are very effective in brain injury. In order to be most effective, the brain has to be saturated with omega-3s using larger than typical doses over the period of 1-3 months or longer. The dose used in the case that was reported on CNN << <http://www.cnn.com/2012/10/19/health/fish-oil-brain-injuries/> >> and also published in the American Journal of Emergency Medicine at << <http://www.ncbi.nlm.nih.gov/pubmed/22867826> >> was this: **A highly concentrated liquid omega-3 formulation, one tablespoon (15ml) twice a day as a push followed by a saline flush for a total of 30ml per day in the feeding tube. This provided about 18 grams of omega-3s (EPA and DHA) per day.**

The case reported in AJEM received the high-quality liquid Omega-3 supplement at this dose for about a year without any problems or side effects. This dose was based on the case report of the lone survivor from the Sago Mine Accident in January 2006 and reported in the Journal of the American College of Surgeons. See << <http://www.ncbi.nlm.nih.gov/pubmed/18656058> >>

Omega-3s are not a drug, just nutrition, and therefore improvement in patients, if seen, typically occurs over the period of weeks to months.

There is a theoretical risk that high dose omega-3s may cause bleeding or stroke. Biochemical pathways tell us this is a valid concern. However, not a single study in the scientific literature has shown this to be of any clinical significance. Bedridden patients are commonly placed on pharmaceutical blood thinners that completely block platelet ability to clot. Studies clearly show omega-3s do not worsen this. Once omega-3 blood levels are at an optimal level, use of pharmaceutical blood thinners should be reconsidered based on appropriate lab testing.

If omega-3s are used, please let us know how it goes. When possible and appropriate, Brain Health Education and Research Institute is interested to publish more case reports. Please let us know if you can help. We are also working towards a case series publication as well as funding prospective open label and placebo controlled clinical trial at a Level 1 Trauma Center. Feedback is very important so we can continue to learn from your experiences as we move towards developing the use of omega-3s in severe brain injury as standard-of-care.