



Practical hints for helping to manage brain trauma

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Since the recent story on CNN (“He’s going to be better than he was before,” Jan. 18, 2014,) about the extraordinary recovery of Grant Virgin from severe brain trauma, I have gotten a lot of requests for information. Since I have been doing this protocol for more than seven years after first working with Dr. Julian Bailes on the equally remarkable recovery of Randal McCloy Jr. (the sole survivor of the Sago mine disaster in 2006) and others (1,2), I can offer some broad guidelines. Make no mistake, each case is different, but these guidelines will considerably help your decision-making process.

What Type of Fish Oil to Use

Purity

When it comes to treating brain trauma, purity and potency of the omega-3 product count. All fish and all fish-oil products are contaminated with various toxins. The most important is polychlorinated biphenyls or PCBs. These are known neurotoxins. It makes little sense giving someone a fish-oil product that is rich in PCBs. One of the dirty secrets of the fish-oil manufacturing industry is that it is extremely difficult to remove PCBs from a final product. In fact, it is so difficult, the industry tries to ignore it. Making a statement that a fish-oil product is free from PCBs is an outright lie. It is equally ridiculous to state that the PCBs levels in its products are lower than the international standards. Those international PCB standards (90 parts per billion or ppb) are so lax that virtually any fish-oil product in the supermarket is going to exceed them. Of course, if you want to heal the brain, then I would recommend looking for the purest fish oil you can find. If you are even considering using fish oil, make sure that the levels of total PCBs are less than 5 ppb. This is 18 times lower than the international standard. Using this more rigorous criterion of purity, your choices become very limited. Furthermore, PCB levels will vary from lot to lot. So you want to make sure that the lot you are actually using contains less than 5 ppb. Go to the product’s website or call the manufacturer. If the manufacturers can’t supply that data, it means they don’t know. If they said it is pure, then they mean it might pass the very lax international standards. Here’s a good rule about fish oils: Trust but always verify. PCB testing is expensive but so is saving a brain. Of course, if you don’t care about potential PCB accumulation in the brain, then use the cheapest fish-oil product you can find.

Potency

You are going to have to use a lot of fish oil to put out the inflammation in the brain and to rebuild it. Therefore, the potency of the fish oil counts. I would never recommend any fish-oil product containing any less than 60% EPA and DHA. Usually the higher the potency of the fish oil, the higher the purity, but not always. Removal of PCBs is very different than increasing omega-3 fatty acid potency. I have tested many high-potency fish oils that also have high PCB levels. Likewise, the omega-3 fatty acids levels will vary from lot to lot. Before you use any omega-3 fatty-acid product, ask for the potency of that particular lot. If company representatives can't provide it or say it meets their standards, then it means they don't really know.

The fish oil needs to contain both EPA and DHA. EPA puts out the inflammation in the brain, and DHA helps rebuild the brain. You need both. I usually recommend a 2:1 ratio of EPA to DHA as that is the ratio I have used for several years with great success.

Omega-3 fatty acids are prone to oxidation, which leads to rancidity. The rancidity comes from breakdown products of the fatty acids into aldehydes and ketones that can cause damage to the DNA. That's why there is an international rancidity standard (called total oxidation or TOTOX) that governs all edible oil trading in the world. Before you use any fish oil product, ask for the TOTOX levels of the finished product (not the raw materials). If it is less than 26 meq/kg (the upper limit for an edible oil), then it is OK to use. If not, don't even consider it.

Amounts

Even if you have a high-quality fish-oil product, you are going to need a lot for brain injuries. This will usually be in the range of 10-15 grams of EPA and DHA per day. That's why you need the high-purity and high-potency fish oil. Because of the high amounts, it will have to be given in a liquid format. Why the high doses? Because you have to put out the fire in the brain before you can rebuild it.

The levels of fish oil needed are based on testing, not guessing. The best test for the levels of fish oil required is the ratio of two fatty acids in the blood. One is arachidonic acid (AA), and the other is EPA. Why this is important is because AA causes inflammation, and EPA reverses inflammation. You measure the levels of AA and EPA using a simple finger-stick blood test. The AA/EPA ratio is not a standard clinical test, but it has been in medical research for nearly 30 years, starting first at Harvard Medical School (3). The AA/EPA ratio will tell you how much a pure fish oil product you need as you want the AA/EPA ratio to be in the range of 1.5 to 3. If the AA/EPA ratio is higher than 3, you will need more fish oil. If AA/EPA is less than 1.5, you will need less fish oil. Maintaining the AA/EPA between 1.5 and 3 addresses the largest concern of using high-dose fish oil, which is potential bleeding. I chose an AA/EPA ratio of 1.5 as my lower limit since that is what it is in the Japanese population, and they don't bleed to death (4-11).

The most inexpensive test for the AA/EPA ratio can be found at www.zonediagnostics.com.

Why drugs don't work, and fish oil does

With severe brain trauma, the usual response of the physician is “we just have to wait”. The reason why is because there are no drugs that can cross the blood-brain barrier to put out the inflammation in the brain. That is not true with omega-3 fatty acids. They can easily enter the brain if there are high enough levels in the blood. What is the correct level in the blood? The AA/EPA ratio will tell you. Not only should the AA/EPA ratio be between 1.5 and 3, but also the EPA levels should be greater than 4% of the total fatty acids in the blood.

What Else?

When using high levels of fish oil even if it is pure and potent, you still have to emulsify it to reduce the size of oil droplets for better absorption. One of the best methods to emulsify liquid fish oil is to mix it with either a seaweed or an aloe vera product to reduce the size of the oil droplets to increase the absorption into the blood.

You also have to provide extra anti-oxidant protection to protect the omega-3 fatty acids from oxidation. The best way is using polyphenols to be mixed with the fish oil before administration. Adding extra virgin olive oil is a good choice. Adding highly purified polyphenol extracts to the liquid fish oil is a better choice.

What to expect

Each case is different. Based on my experience if you are using the correct amount of omega-3 fatty acids, you should see the beginnings of a response within 60 days. In Grant’s case, it was two days. If you do, then continue the same level of fish oil since putting out the inflammatory fire is only the first step of the process. The next step is rebuilding the brain. I would suggest monitoring the AA/EPA ratio every 30 days for the first 60 days and then every 60 days thereafter to make sure you are giving the right amount of fish oil.

Most importantly, this is not a Mr. Wizard home experiment. You should always be working with your physicians, not against them. They will also need education in the use and safety of high-dose fish oil, but this short summary is a good start.

Don’t expect any reimbursement from your insurance company for the use of the fish oil or AA/EPA testing. It may seem expensive, but compared to the human suffering of not trying to rebuild the brain, the costs of both the fish oil and AA/EPA testing are minor. I would also consider using flexible- spending health-care accounts if you have access to them to lower the overall cost, since they are based on pre-tax income.

Taking fish oil and following an anti-inflammatory diet is key

One of the reasons for Grant Virgin’s rapid progress was the fact that he was already taking moderate doses of fish oil for a medical condition. This meant he already had some reserve capacity in the body and the brain to reduce the inflammatory burden caused by a hit-and-run accident. You never know when brain trauma will occur. Maintaining a relatively low AA/EPA ratio in the blood is your best insurance policy for protection against future brain trauma if it does strike. You don’t have to be as aggressive as in the treatment phase, but aim for keeping the

AA/EPA ratio between 5 and 10 in the blood. For comparison, the average American has an AA/EPA ratio of 20 (12). When dealing with brain trauma, an ounce of prevention is worth pounds of cure.

Finally, to accelerate the healing and rebuilding of the brain, you want to be following an anti-inflammatory diet (13-15). An anti-inflammatory diet is one that reduces the production of AA that drives inflammation in the brain. The less AA you have in the blood, the less AA gets into the brain. Try to keep the AA level in the blood to less than 9% of the total fatty acids. This takes more work than simply giving fish oil, but the more you reduce the levels of AA in the blood, the less high-dose fish you will need to maintain the AA/EPA ratio required to accelerate the healing and rebuilding process in the brain.

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