

## **James L. Holly, M.D.**

**Omega 3 Fish Oil  
The JELIS Study  
By James L. Holly, MD  
Your Life Your Health  
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The recent return home of the only survivor of the Sago mine disaster, Randall McCloy Jr., seems miraculous and it was. Yet, there is a sound basis for his recovery. McCloy, who had suffered heart, kidney, and liver failure in addition to brain failure, returned home less than four months after the mining disaster. One of the principle reasons for this recover was Dr. Bailes' administering of very high doses of Omega 3 Fish Oil to McCloy.

McCloy received (and continues to take) 15 grams per day of EPA and DHA. Although a seemingly extraordinarily high dose, McCloy's blood levels of these fatty acids were constantly monitored to maintain them within a therapeutic zone to maximize the reduction of systemic inflammation without compromising the body's ability to fight infection.

The implications of Randall McCloy's remarkable recovery have widespread medical importance, not only for brain trauma patients, but also for any patient with neurological disorders. It has been demonstrated by Harvard Medical School that high-dose fish oil has significant benefits in treating bipolar depression, and a recent study demonstrated the same levels used by Dr. Bailes in treating Randall McCloy also demonstrated significant improvement in children with ADHD. Maybe this is why our grandmother called fish oil "brain food."

### **JELIS Study**

A recent study in Japan, called the JELIS Study, supports Omega-3 use in angina, coronary artery disease and lipid (cholesterol) management. The JELIS study used a dose of 1800 mg of EPA, one of the major Omega-3 fatty acids. Typically, we recommend 4 gms. a day of combined EPA and DHA and as seen above much higher doses are found to be beneficial in special cases.

**Caution:** Because of the potential for Omega-3 Fish oil to interfere with platelet aggregation and blood clotting, those who are taking aspirin, coumadin, plavix or other medications which can interfere with blood clotting should take Fish Oil cautiously as it may require that other medications be adjusted.. Don't forget, Eskimos, who have virtually no heart disease, regularly consume 15 grams of fish oil daily in their diet.

**Calculation:** In order to determine how much Omega-3 Fish Oil you are taking, read the label. The EPA and the DHA will be listed in milligrams (mgs). If you add these two values together, i.e., if your brand has 400 mg of EPA and 200 mg of DHA, that will be 600 mg of Omega-3 Fish oil – you can determine how many capsules you have to take in order to get the therapeutic dose you are aiming for. For instance in this illustration, in order to take 4 gms (4,000 mgs) of Omega-3 a day, would need to take 7 capsules a day, i.e.  $7 \times 600 \text{ mg} = 4200 \text{ mg}$  or 4.2 grams.

**Concentration and Quality:** The more concentrated the content of EPA and DHA is, the fewer capsules you will have to take each day. Also, please be aware that all Omega-3 fish oils are not the same. Some are pharmaceutical grade which means that they are prepared under the most exacting circumstances and will have very few impurities such as mercury. While some commercial companies will tell you that their production is the “only” pharmaceutical grade Omega-3 Fish oil, there actually are a number of good products available.

### **More from the JELIS Study**

At the 2005 American Heart Association meeting, the JELIS Study (Japanese EPA Lipid Intervention Study) showed that Eicosapentaenoic Acid (EPA), combined with a statin (lipid lowering agents such as Lipitor, Crestor, Zocor, have an additive beneficial result on primary treatment (preventing occurrences) and secondary treatment (preventing recurrences) of heart disease.

The study followed 18,645 participants in which 9,326 were given 1,000 milligrams daily of highly purified EPA capsules. Japan has used this dosage for the past 16 years in treating lipid abnormalities and peripheral vascular diseases (narrowing of the arteries in the legs)

The primary endpoint of the JELIS study was those who experience sudden cardiac death, heart attack, unstable angina (sustained chest pain due to the heart receiving less oxygen than it needs) or undergoing procedures to reopen blocked arteries. After 4.5 years of follow-up, one of these end-points was experienced in 2.8 percent of patients treated with statins plus EPA compared with 3.5 percent in the statin-only group. This represents a 19 percent reduction in risk with EPA plus statin compared to statin treatment alone.

The study also found that 8.7 percent of statin/EPA-treated patients in the secondary prevention group ( those who had already experience one of the end points before starting Omega-3 Fish Oil) experience a recurrence of one of the above listed heart problems while 10.7 percent of those with the statin-only secondary prevention group experience another cardiac even. Again this is a 19% reduction.

Epidemiological studies have shown that a diet rich in Omega-3 fatty acids, which are abundant in cold water fish, is protective against death and disability from coronary heart

disease. Other studies have show statins to be similarly beneficial. JELIS shows that a combination of the two adds additional benefit.

Interestingly, JELIS found that the benefits of the combination therapy did not seem to be due to changes in cholesterol. Both combination and statin-only therapy reduced LDL, the “bad” cholesterol by the same amount – 26% -- yet the double therapy reduced cardiovascular risk.

## **Eicosanoids**

The primary effect of Omega-3 Fish oils is to effect the eicosanoids which regulate many cell functions and play crucial roles in a variety of physiological and pathophysiological processes, including regulation of smooth muscle (the muscle in your heart and arteries) contractility and various immune and inflammatory functions. The word *Eicosanoids* is derived from the Greek word for twenty, *eicosa*, since all these hormones are synthesized from essential fatty acids that are twenty carbon atoms in length.

The first eicosanoids were discovered in 1936 and were isolated from the prostate gland and were called prostaglandins which are a small subset of the much larger family of eicosanoids. Every living cell in the body can make eicosanoids. Biochemists have identified more than a hundred eicosanoids and are finding more each year. In 1971, it was discovered that aspirin actually works by changing the level of eicosanoids.

Eicosanoids are made, act, and self-destruct within seconds and are thus difficult to study. They don't circulate in the bloodstream and thus are extremely difficult to sample. The classes of eicosanoids are:

- Prostaglandins
- Thomboxanes
- Leukotrienes
- Lipoxins
- Hydroxylated fatty acids
- Aspirin-triggered epi-lipoxins
- Isoprostanoids
- Epoxyeicosatrienoic acids
- Endocannabinoids

## **Eicosanoids' mission**

**Endocrine** glands such as the thyroid do not have ducts through which their product is distributed to the body. They are distributed by the circulating blood. **Exocrine** glands such as the pancreas have ducts which take their product to the point of use. **Autocrine** glands or cells secrete products which influence the secretion of another product by the same cell.

Eicosanoids are autocrine hormones. They are secreted by the cell to test the external environment and then report back to the cell what was just outside by interacting with its receptor on the cell surface. On the basis of this information, the cell could take the appropriate biological action (via the appropriate second messenger) to respond to any change in its environment.

### **General Concepts about eicosanoids**

There are “good” and “bad” eicosanoids depending upon their effect upon certain bodily functions. However, wellness really is a function of balance between "good" and "bad" eicosanoids. The AA (arachidonic acid) to /EPA eicosapentaenoic acid) ratio in the blood will indicate where you stand in terms of such a balance between good and bad eicosanoids.

### **Actions of Good and Bad eicosanoids**

#### **Good Eicosanoids**

- inhibit platelet aggregation
- promote vasodilation
- inhibit cellular proliferation
- stimulate immune response
- anti-inflammatory
- decrease pain transmission

All of these actions promote healthy arteries and slows the development and/or progression of heart disease.

#### **Bad Eicosanoids**

- promote platelet aggregation
- promote vasoconstriction
- promote cellular proliferation
- depress immune response
- pro-inflammatory
- increase pain transmission

All of these actions, when out of balance, promote heart disease and hardening of the arteries.

There are three ways your diet can promote the activity of bad eicosanoids:

- Eating a high carbohydrate diet
- Consume large amounts of alpha linolenic acid which is an omega 3 fatty acid found in flax seeds, flax seed oil and walnuts.
- Eating trans fats which are found in packaged and processed foods.

While this information is technical, it affirms the fact that Omega-3 Fish oil in the diet and as a supplement is healthy. It also demonstrates how you can change your health by the choices you make. There are very few people – including and maybe especially children – who will not benefit from Omega-3 Fish oil. Remember, it is your life and it is your health.