

The Many Uses of Omega-3 Fatty Acids

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Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are omega-3 essential fatty acids (EFAs). Omega-3 EFA supplements are mostly derived from coldwater species of fish like salmon, sardines, herring and mackerel; as well as from a few vegetarian sources, such as flaxseed oil. There are many therapeutic applications for omega-3 EFAs, primarily due to their cardiovascular-enhancing and anti-inflammatory benefits. Research has shown that the cardiovascular benefits of omega-3 EFAs include reducing the risk of atherosclerosis, modifying cholesterol levels (i.e., increasing “good” HDL cholesterol, while decreasing “bad” LDL cholesterol), decreasing triglycerides and decreasing high blood pressure. Omega-3 EFAs have also been shown to block the production of certain inflammatory chemicals in the body. Consequently, studies have demonstrated the ability of omega-3 EFAs to reduce inflammation in such disorders as rheumatoid arthritis, asthma, colitis, Crohn’s disease and lupus. In addition, omega-3 EFAs may reduce the symptoms of other disorders including angina, migraine headaches, psoriasis and tinnitus.

Most fish oil supplements come in a mixture of 18 percent EPA and 12 percent DHA. Therefore, in 1,000 mg of fish oil there would be 180 mg EPA and 120 mg DHA. However, it makes sense to seek out more concentrated preparations, which minimize the amount of fish oil consumed helping to prevent gastric reflux. Products are available in the 375 mg EPA and 250 mg DHA range, providing 625 mg of total omega-3s. The doses recommended in the following conditions are based on the use of a supplement providing 625 mg of total omega-3s.

People who take omega-3 EFAs may also need to take vitamin E to protect the oil from oxidative damage in the body.¹ The vitamin E can be included with the omega-3 EFA, or as a separate supplement.

Cardiovascular Health

There is so much research supporting supplementation with omega-3 EFAs in **atherosclerosis** that it is unnecessary to go beyond research conducted in just the last few years to make the case. These studies have clearly shown that omega-3 EFAs can reduce risk factors for atherosclerosis,^{2,3} as well as slowing the progression of the disease itself.^{4,5} As a matter of fact, The Physicians Health Study (22,071 doctors) suggests fish oils can reduce a man’s risk of dying from a heart attack by 80 percent.⁶ Likewise, the Nurses Health Study (84,688 female nurses), found omega-3 EFAs can cut a woman’s risk of death by heart attack by 33 percent.⁷

Omega-3s are actually able to lower levels of certain genetically predisposed substances that are relevant to atherosclerosis.⁸ Another related benefit is that omega-3s reduce the potential for blood clots in atherosclerosis patients.⁹ An effective dose would be one to three capsules daily.

One of the main mechanisms by which omega-3s work is by affecting **cholesterol**. Including fish as a regular part of the diet has been shown to increase HDL cholesterol,¹⁰ and is linked to a reduced risk of heart disease in the majority of studies.¹¹ Fish not only contains very little saturated fat, but its oils are rich in the omega-3 EFAs that appear to protect against heart disease.¹² Of course omega-3s are available in supplemental form, and research has shown supplementation with omega-3 EFAs lowers total cholesterol, LDL cholesterol and triglycerides, while increasing HDL cholesterol.^{13,14} An effective dose would be five capsules daily.

Also in the realm of cardiovascular health is the impact of omega-

3s on **high blood pressure**. According to a meta-analysis of 31 studies, the omega-3s found in fish oil effectively lower blood pressure.¹⁵ This effect was dependent on the amount of omega-3s used, with best results occurring in studies using very high doses, around 15 g/d. Obtaining 15 grams of omega-3s would generally require consuming an enormous number of capsules! Such huge doses would not be a reasonable addition to a dietary supplement program for most people. Another possibility is to use the higher potency omega-3 EFAs discussed earlier, which could yield 3 g/d; research has shown significant reductions in blood pressure occurred at these lower intakes, just not as impressively as with the higher doses.

Finally, omega-3 EFAs have been studied in the treatment of **angina**. Some research indicates that 3 g or more of omega-3 EFAs three times per day (providing a total of about 3 g EPA and 2 g DHA) have reduced chest pain as well as the need for nitroglycerin, a common medication used to treat angina.¹⁶ However, other research did not confirm these benefits.¹⁷ Based upon the research showing results, an effective dose would be eight capsules daily; however, people wishing to take this high dose should first consult with a nutritionally oriented physician.

Inflammation

To understand why omega-3 EFAs have anti-inflammatory benefits, it is important to understand how inflammation works. Many factors contribute to the complex course of inflammatory reactions. One important contributing factor is the fatty acid, arachidonic acid (AA). AA can be converted via an enzymatic process into pro-inflammatory substances, especially one called prostaglandin 2 (PG2). In states of inflammation, it seems omega-3 EFAs are able to compete with AA for enzymatic metabolism, which results in less production of PG2. Generally, for inflammatory conditions, one to two capsules daily appears to mitigate the inflammatory response.

Well-controlled clinical studies have clearly demonstrated consumption of omega-3 EFAs results in improvements in **rheumatoid arthritis** (RA) sufferers.¹⁸ As a matter of fact, a comprehensive review of medical literature by a board certified rheumatologist revealed treatment with omega-3 EFAs was associated with improvement in outcome measures in RA, and was able to help decrease the long-term requirements for nonsteroidal anti-inflammatory drugs (e.g., aspirin, ibuprofen) in some circumstances.¹⁹ Furthermore, an expert workshop reviewing the health effects of omega-3s concluded these natural substances helped alleviate the symptoms of RA.²⁰ It should be noted these omega-3 EFA-related benefits were not limited to adult RA sufferers. A study conducted in the Czech Republic found children with chronic juvenile arthritis were able to decrease their ibuprofen consumption by 17.3 percent over a period of five months when treated with a high omega-3 EFA diet.²¹

The same inflammatory mechanism previously described holds true for the inflammatory process involved in **asthma**, and the beneficial role of omega-3 EFAs in treating this disorder. This was demonstrated in a clinical trial where omega-3s significantly decreased bronchial hyper-reactivity in patients suffering from seasonal asthma due to airborne allergens.²² Similar research with omega-3 EFAs in asthma has shown a reduction of symptoms.^{23,24,25}

There is a significant amount of research documenting the effectiveness of omega-3 EFAs in the treatment of **inflammatory bowel conditions**. For example, in two randomized, double blind,

placebo-controlled, crossover trials, administration of omega-3 EFAs resulted in significant improvements in colitis patients; including the ability to reduce or eliminate use of anti-inflammatory drugs.^{26,27} Other studies have shown similar beneficial results in colitis with omega-3 EFAs.^{28,29,30} Significantly lower levels of the omega-3s have also been found in Crohn's disease patients.³¹ Other research has suggested that a reduction in omega-3s may be relevant to the activity of the disease.³² In fact, in animal research, supplementation with omega-3 EFAs markedly reduced bowel lesions after 30 days, and inflammation and ulceration in the bowel were almost absent by day 50.³³

Supplementation with omega-3 EFAs has prevented autoimmune **lupus** in animal research.³⁴ In a double blind study, 20 g/d of fish oil combined with a low fat diet led to improvement in 14 of 17 people with systemic lupus erythematosus in 12 weeks.³⁵ Smaller amounts of fish oil have led to only temporary improvement in other double blind research.³⁶ If the higher potency fish oil supplement is used, then the 20 g dose could be halved to 10 g. This would still require, however, the consumption of 15 to 18 capsules daily. People wishing to take such a large amount of fish oil should first consult with a nutritionally oriented physician.

Additional Conditions

Omega-3 EFAs have benefits in other health conditions as well. Research indicates omega-3s may reduce the symptoms of **migraine headaches**.^{37,38} The omega-3s in fish oil may help due to their effects in modifying prostaglandins,³⁹ hormone-like substances made by the body, and/or due to the platelet-stabilizing and antivasospastic actions.⁴⁰ One study used 1 g of fish oil per 10 pounds of body weight. This would be a tremendous amount of fish oil to consume; even if higher potency omega-3 supplements were used, the number of capsules consumed at this rate may be prohibitive. Some researchers have suggested that heart disease patients could benefit from low doses (1 g/d to 6 g/d) of fish oils; similar benefits might be achieved by migraine patients at that level.

Moving on to skin health, in a double blind study, fish oil (10 g/d) was

found to improve the skin lesions of **psoriasis**.⁴¹ In another study, supplementing with 3.6 g/d of purified EPA reduced the severity of psoriasis after two to three months.^{42,43} That amount of EPA is contained in about 20 g of fish oil; people wishing to take such high doses should first consult with a nutritionally oriented physician. Another possibility is topical use. One study showed applying a preparation containing 10 percent fish oil directly to psoriatic lesions twice daily resulted in improvement after seven weeks.⁴⁴ Supplementing with fish oil also may help prevent the increase in blood levels of triglycerides that occurs as a side effect of certain drugs used to treat psoriasis (e.g., etretinate and acitretin).⁴⁵ An effective dose for this purpose would be eight to ten capsules daily, taken in consultation with a nutritionally oriented physician.

Finally, in 1980, research published in a British medical journal suggested certain "baropathic" disorders, including **tinnitus**, might be related to prostaglandin disturbances induced by primary or secondary EFA deficiencies. Subsequent research published in an American journal discussed the relationship between omega-3 EFA supplements, and amelioration of certain mental disorders that included tinnitus as a symptom.^{46,47} An effective dose would be one to two capsules daily.

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