7. Essential Contribution of Omega-3 Fatty Acids

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Introduction. Omega-3 fats are an integral part of cell membranes throughout the body and affect the function of the cell receptors in these membranes. They provide the starting point for making hormones that regulate blood clotting, contraction and relaxation of artery walls, and inflammation. They also bind to receptors in cells that regulate genetic function. Likely due to these effects, omega-3 fats have been shown to help prevent heart disease and stroke, may help control lupus, eczema, and rheumatoid arthritis, and may play protective roles in cancer and other conditions.

Omega-3 fats are a key family of polyunsaturated fats. There are three main omega-3s:

- Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) come mainly from fish, so they are sometimes called marine omega-3s.
- Alpha-linolenic acid (ALA), the most common omega-3 fatty acid in most Western diets, is found in vegetable oils and nuts (especially walnuts), flax seeds and flaxseed oil, leafy vegetables, and some animal fat, especially in grass-fed animals. The human body generally uses ALA for energy, and conversion into EPA and DHA is very limited.

The strongest evidence for a beneficial effect of omega-3 fats has to do with heart disease. These fats appear to help the heart beat at a steady clip and not veer into a dangerous or potentially fatal erratic rhythm. Such arrhythmias cause most of the 500,000-plus cardiac deaths that occur each year in the United States. Omega-3 fats also lower blood pressure and heart rate, improve blood vessel function, and, at higher doses, lower triglycerides and may ease inflammation, which plays a role in the development of atherosclerosis.

Several large trials have evaluated the effect of fish or fish oils on heart disease. In the Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto Miocardio (known as the GISSI Prevention Trial), heart attack survivors who took a 1-gram capsule of omega-3 fats every day for three years were less likely to have a repeat heart attack, stroke, or die of sudden death than those who took a placebo. Notably, the risk of sudden cardiac death was reduced by about 50 percent. In the more recent Japan EPA Lipid Intervention Study (JELIS), participants who took EPA plus a cholesterol-lowering statin were less likely to have a major coronary event (sudden cardiac death, fatal or nonfatal heart attack, unstable angina, or a procedure to open or bypass a narrowed or blocked coronary artery) than those who took a statin alone.

Researchers are taking a hard look at a different sort of balance, this one between possible effects of marine and plant omega-3 fats on prostate cancer. Results from the Health Professionals Follow-up Study and others show that men whose diets are rich in EPA and DHA (mainly from fish and seafood) are less likely to develop advanced prostate cancer than those with low intake of EPA and DHA. At the same time, some-but not all-studies show an increase in prostate cancer and advanced prostate cancer among men with high intakes of ALA (mainly from supplements). However, this effect is inconsistent. In the very large Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial, for example, there was no link between ALA intake and early, late, or advanced prostate cancer.