

PART III

The AI Supplement Plan

CHAPTER 8

Good Fats That Rev Up Your Body's Natural Anti-Inflammatories

Anita: Fish Oil for Lower Blood Pressure

Anita was a widowed single mother who looked much older than her thirty-six years. The pressures of working and mothering three young children forced her to stop making home-cooked meals in favor of giving her kids burgers, fries, pizzas, and quick-energy foods such as candy bars and soft drinks. At the end of each day she collapsed into bed, exhausted and drained.

Over two years, Anita had gained thirty pounds and now experienced frequent headaches and suffered joint pain in her hips, shoulders, and hands. Her medical doctor prescribed ibuprofen, and a rheumatologist told her she had some (but not all) of the signs of lupus erythematosus. She was developing stomach pain from the ibuprofen, and medications for the lupuslike symptoms caused double vision. Anita's blood pressure had risen to 190/100 and her blood sugar was more than 240, clearly in the diabetic range. These clinical findings led to additional prescriptions for hypertensive and glucose-lowering medications.

A friend recommended that Anita consult with Judy A. Heill, N.D., a naturopathic physician in Tucson, Arizona. After a workup Heill asked

Anita to follow a simple, wholesome diet similar to the AI Diet Plan. Anita began eating more fish, chicken, turkey, and vegetables, while avoiding processed foods, soft drinks, coffee, and dairy products. Heill also asked her to take several anti-inflammatory supplements, including fish oil capsules (1,000 mg twice daily), as well as ginger, turmeric, and bromelain.

Anita's response was dramatic. After three weeks she had lost ten pounds and her glucose had normalized, enabling her to stop taking the glucose-lowering medications. Her pain, swelling, and stiffness decreased considerably, and her energy levels began to increase. At a six-week follow-up visit Anita had lost a total of eighteen pounds, and her blood pressure was normal, so she was able to stop taking the hypertensive medications. In addition, her joint pain was almost entirely gone, flaring up only when she went off her diet of simple, wholesome foods. Anita no longer had a need to take cortisone drugs for her lupuslike symptoms. Her headaches were gone, her energy levels were better, and she actually looked younger.

Omega-3 Fish Oils

You read in chapter 3 that the omega-3 fatty acids form the building blocks of many of the body's natural, innate analgesic substances. Fish oil supplements, which are produced from salmon and other varieties of coldwater fish, are rich in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Both fatty acids are essential for health and play roles in the body's defenses against inflammation.

If the research on omega-3 fatty acids were seen in political terms, it would amount to a landslide victory. More than 8,000 scientific and medical articles have been published on the omega-3s, and medical journals currently publish approximately 800 news articles on the omega-3s each year. The omega-3s protect against heart diseases, cancer, Alzheimer's, mood disorders, arthritis, eye diseases, and numerous other health problems. It's no wonder they frequently garner bold newspaper headlines.

The advantage of taking fish oil capsules is simple: your body does *not* have to convert alpha-linolenic acid to EPA and DHA. As a result, supplements leapfrog several troublesome biochemical steps and bottlenecks. Your body quickly converts EPA and DHA to a variety of very potent anti-inflammatory compounds, including prostaglandin E₃, leukotriene B₅, resolvins, and protectins. These compounds counteract and suppress a variety of pro-inflammatory substances, including prostaglandin E₂, thromboxane B₂, interleukin-6, and C-reactive protein.

Fish Oils Protect against Heart Disease

One key discovery that led up to the concept of the inflammation syndrome was the medical recognition that chronic, low-grade inflammation (rather than cholesterol) causes coronary heart disease. It shouldn't be surprising, then, that eating fish or taking fish oil capsules is a phenomenal way to reduce inflammation and the risk of developing heart diseases. The cardiovascular benefits of omega-3 fish oils derive directly from the anti-inflammatory effects of EPA and DHA.

The modern story of omega-3 fish oils began in 1973, when Danish researchers investigated why traditional Eskimos who followed a high-fat diet were less likely to develop heart disease, compared with Eskimos who had a Western diet with meat and dairy foods. The researchers determined that the traditional Eskimo diet included large amounts of omega-3 fatty acids. Another study along these lines, published in 2001, found that Canadian Eskimos who had a traditional diet, including fish and marine mammals, had half the incidence of cardiovascular-related deaths, compared with other Canadians.

- *Coronary heart disease.* An analysis of studies, reported in the June 2008 *American Journal of Clinical Nutrition*, concluded that a modest consumption of fish (one or two servings weekly) reduced the risk of deaths from coronary heart disease by more than one-third. Meanwhile, a large European study found that omega-3 fish oil supplements led to significant reductions in cardiovascular-related deaths, heart attacks, and strokes.
- *Triglycerides.* High levels of these blood fats are a major risk factor for developing heart disease. Omega-3 fish oils are so effective at lowering triglycerides that the Food and Drug Administration has approved a "drug" version of omega-3s (called Lovaza) to reduce triglyceride levels. The drug costs \$4 a day (for four capsules of Lovaza), compared with about 40¢ a day for over-the-counter fish oils that are just as good.
- *Coagulation.* The omega-3 fish oils have a mild blood-thinning effect, which reduces the risk of developing blood clots in arteries. Fish oil supplements (3 grams daily) can lower levels of fibrinogen and other clotting factors.
- *Blood pressure.* Omega-3 fish oils have a moderate blood pressure-lowering benefit, particularly in people who have both hypertension and high cholesterol levels.

- *Heart rate and rhythm.* The omega-3s have long been known to reduce the risk of erratic heartbeats called arrhythmias. In a study published in the *British Journal of Nutrition*, researchers gave fish oil supplements or placebos to sixty-five overweight and sedentary adults. Fish oils decreased the subjects' resting heart rates and also reduced abnormal variability in their heart rates. In other research, fish oil supplements decreased the risk of fatal arrhythmias by almost 30 percent.
- *Benefits during and after heart surgery.* Surgeons and anesthesiologists typically discourage patients from taking nutritional supplements. In a recent study, however, European researchers gave 8 grams of omega-3 fish oil capsules daily to coronary artery bypass patients. The fish oils led to decreases in the patients' "bad" very-low-density lipoprotein (VLDL) cholesterol and increases in their "good" high-density lipoprotein (HDL) cholesterol. Another benefit: the patients had low levels of troponin, a marker of surgery-related heart damage.

Fish Oils Protect against Osteoarthritis

Fish oil supplements may halt the breakdown of joint cartilage. Bruce Caterson, Ph.D., of Cardiff University, Wales, found that the omega-3 fatty acids inhibit the activity of aggrecanases, a family of enzymes that breaks down cartilage. In his experiments, Caterson noted that the omega-3s also blocked the activity of tumor necrosis factor alpha, a powerful inflammation-promoting compound.

Fish Oils Help in Rheumatoid Arthritis, Too

In a study reported in the May 2008 issue of *Rheumatology*, doctors asked ninety-seven patients to take either 10 grams of cod liver oil daily (providing 2.2 grams of omega-3s) or placebos for nine months. About 40 percent of patients taking the cod liver oil were able to reduce their use of nonsteroidal anti-inflammatory drugs (NSAIDs) by one-third or more during the course of the study. This was good news for two reasons: One, although the researchers did not directly measure pain or flexibility in the patients, less dependence on NSAIDs reflects less pain. Two, taking fewer NSAIDs reduces the risk of experiencing drug complications, including gastric ulcers and compromised liver function.



Discussing Nutritional and Herbal Supplements with Your Physician

If you are like many people, you have been frustrated when you tried to discuss supplements with your physician. All too often, doctors quickly dismiss their patients' questions about supplements.

Why? Nobel laureate and vitamin advocate Linus Pauling, Ph.D., explained it this way: "If a doctor isn't 'up' on something, he's 'down' on it." That is *really* the case.

Unfortunately, most physicians don't know much about nutrition because medical schools have given the subject a very low priority. Medicine, as the name suggests, places the greatest emphasis on pharmaceutical medicines and surgery. Furthermore, it's difficult for many people, including physicians, to admit that they don't know much about a particular subject. How often do you hear anyone admit, "I don't know much about that?"

Many physicians' critical thinking processes tend to be very narrow, and doctors can be as gullible as anyone in the world at large, swayed by the limitations of their own training, pharmaceutical company advertising, and misleading articles that question the value of diet and vitamin supplements.

The nutritionally oriented physicians whom I know suggest that the best way to talk about nutritional therapies with a skeptical doctor is to be firm but nonconfrontational. Physicians don't have a lot of time to keep up with their specialties, let alone delve into another one, such as nutrition. They may also have financial and therapeutic constraints imposed by health maintenance organizations (HMOs), insurers, or even the other doctors in their offices or hospitals, limiting what they can actually do in terms of treatment.

So, one approach might be to say something like, "Doctor, using vitamins, fatty acids, and herbs to reduce my inflammation appeals to me because they are safe and the evidence seems pretty solid. I would prefer not to treat myself, so, as your patient, I would like you to take some time to seriously study some of the research in this area. I'll even lend you this book. Please do me a favor and take the time to look into this and work with me."

If a sincere appeal fails, you may have to change physicians in order to find one who is nutritionally oriented or "integrative." This is easier

than it used to be, and the names of several organizations that make referrals of nutritionally oriented doctors are listed in the appendix at www.inflammationsyndrome.com. Most nutritionally oriented physicians are not part of HMOs, and insurers may reimburse for only some of their services. In other words, they work in a traditional fee-for-service arrangement, so you will have to pay yourself. This may be more expensive, but it will likely lead to you gaining a nutritional program, a doctor who takes a little more time with you, and better care. You might be able to get mediocre care for free, but is that what you really want for your long-term health?



Fish Oils May Reduce Cancer Risk

Eating foods that are rich in omega-3 fatty acids or taking fish oil supplements may reduce the risk of developing cancer. Bruce N. Ames, Ph.D., an eminent cell biologist at the University of California, Berkeley, noted that 30 percent of cancers result from chronic inflammation or chronic infections. (Infections increase inflammation.)

The benefits of omega-3s are most striking in breast and prostate cancers. Studies have found that large amounts of linoleic acid (the parent omega-6 molecule) in corn oil and other common cooking oils increase the proliferation of breast and prostate cancer cells. In contrast, fish oils can prevent and slow the growth of these cancers. Corn oil has an omega-6 to omega-3 ratio of 60:1, and safflower oil a ratio of 77:1—far from our ancient balance of 1:1.

Some of the omega-6 fatty acids, particularly arachidonic acid, activate a variety of pro-inflammatory compounds, such as nuclear factor kappa beta (NFkB). NFkB activates genes involved in inflammation, and it also stimulates the activity of cancer cells. The omega-3 fatty acids (and many antioxidants) dampen the activity of NFkB.

Human studies have been consistent with cell and animal studies showing that omega-3 fish oils reduce the risk of developing cancer. Paul Terry, Ph.D., and his colleagues at the Karolinska Institute in Sweden tracked the health of more than 6,000 male twins, beginning when most of the men were in their midfifties. Terry found that men who regularly ate fish had one-half to one-third the risk of getting prostate cancer, compared with those who did not eat fish.

Fish Oils Improve Mood

There is growing evidence that inflammation in the brain is related to many diseases, including multiple sclerosis, and that inflammation of the tissues or the blood vessels in the brain affects our moods. The reason is that psychological stress increases the body's production of pro-inflammatory molecules.

Between 50 and 60 percent of the brain consists of fat, and the types of fat in your brain tend to reflect your eating habits. EPA and DHA get incorporated into the fatty membranes (walls) of cells, where they influence how cells communicate with one another. When other fats are incorporated in their place, communication between brain cells is disrupted.

In ancient times, people consumed roughly equal amounts of the omega-3s and the omega-6s and no trans fats. Today, the average American consumes twenty to thirty times more omega-6s than omega-3s, as well as substantial amounts of trans fats. As a result, the omega-3s are virtually nonexistent in many people's diets, contributing to depression and other mood disorders.

A high intake of the omega-6s increases the risk of suffering from depression, whereas many studies have found that omega-3 fish oil supplements are helpful in treating depression. These studies have included both children and adults and have shown that 2 to 6 grams of fish oils daily is a beneficial amount to take.

Supplements of the omega-3s can help reduce impulsive behavior, hostility, and physical aggressiveness. For example, a double-blind study of forty middle-age men and women found that 1.5 grams of DHA daily led to significant reductions in aggressive behavior in only two months. Meanwhile, when prison inmates in England were given fish oil supplements, their behavior improved and they were far less likely to act violently.

The mood and cognitive benefits of eating fish and taking fish oil supplements pay off in the long run, too. Numerous studies have found that people who regularly eat fish or take fish oil supplements maintain better memories as they age and are less likely to develop cognitive problems and Alzheimer's disease.

Fish Oils Protect the Eyes

Several studies have found that the omega-3s can reduce the risk of age-related macular degeneration (AMD), the leading cause of blindness

among seniors. Researchers at the University of Melbourne, Australia, analyzed nine studies that focused on fish consumption and omega-3 intake in relation to AMD. People who ate fish at least twice each week had a one-fourth lower risk of developing early-onset AMD and a one-third lower risk of having late-onset AMD. A high intake of omega-3 fatty acids from all sources was associated with almost a 40 percent lower risk of developing AMD.

The incidence of AMD also rises when people's diets are low in lutein, an antioxidant found in spinach, kale, broccoli, and other dark green vegetables. Lutein forms the macular pigment, a yellowish region in the center of the eye's retina. Supplements increase the thickness of the macular pigment, and a combination of lutein and DHA seems to be particularly beneficial to the eyes. Researchers at Tufts University, Boston, found that taking 12 mg of lutein and 800 mg of DHA supplements improved the macular pigment but in slightly different ways. The lutein supplements increased the thickness of the outer region of the macular pigment, whereas the DHA supplements thickened the central part of the macular pigment.

Another study, conducted at Harvard University, found that a high intake of omega-3 fatty acids reduced the incidence of dry eyes, whereas a low intake of omega-3 fatty acids increased the occurrence. A high intake of omega-6 fatty acids, particularly linoleic acid, seemed to heighten the chances of developing dry eyes.

Fish Oils May Help with Weight Loss

The types of fats you consume influence weight gain and loss, regardless of their calories, and omega-3 fish oils may help you lose weight. In effect, fish oils appear to counteract the tendency of trans fats to increase body fat.

Researchers at the University of South Australia, Adelaide, asked study participants to take various supplements, including 1,560 mg of DHA and 360 mg of EPA daily, and to engage in light exercise for three months. The combination of fish oils and exercise led to each person experiencing several pounds of weight loss—more than with people taking a placebo and exercising.

The Problem with Flaxseed Oil

Some companies market flaxseed oil as an alternative to omega-3 fish oils. Flax may have some health benefits, but it is not a reliable source of

EPA and DHA. Flaxseed oil contains only alpha-linolenic acid and no EPA and DHA.

The idea is that your body will convert the alpha-linolenic acid in flaxseed oil to EPA and DHA. This conversion, however, is fraught with problems. First, most people do not accomplish this conversion with great efficiency. Sometimes the reason is related to age: older people have more difficulty with the conversion. A more common problem is that trans fats disable the delta-6-desaturase enzyme, which is crucial to the conversion. Even if you currently avoid foods containing trans fats, you likely ate them at some point over the last thirty years and your body may have lasting damage from them.

If you are a vegetarian and don't consume fish, you may think that flaxseed oil is your only option. Again, it is not equivalent to fish oils. Some companies, however, are preparing to market echium oil supplements, derived from *Echium plantagineum*, a plant that contains both gamma-linolenic acid and stearidonic acid. The delta-6-desaturase enzyme converts alpha-linolenic acid to stearidonic acid but not very efficiently. Yet studies have shown that people do readily convert stearidonic acid to EPA.

Three Recommended Supplements

As your first step to reducing inflammation, I recommend taking omega-3 fish oils (which contain EPA and DHA) and gamma-linolenic acid (GLA). You'll find many different brands on the market, but these are the three I recommend.

1. *Carlson Inflammation Balance*. This is my top recommendation; a high-potency combination of EPA, DHA, and GLA. These three fatty acids are the building blocks of the body's most powerful anti-inflammatory compounds. The product contains 200 mg of omega-3 fatty acids (EPA and DHA) and 200 mg of GLA per capsule. You can take one to three capsules daily. It's difficult to find combinations like this, and consumers can safely increase the daily number of capsules to suit their personal needs. Inflammation Balance contains 1,000 IU of vitamin D and 100 IU of vitamin E per capsule, as well, which also have anti-inflammatory benefits. (More details can be found at www.carlsonlabs.com.) *Tip*: Start by taking four capsules daily for two weeks to rapidly increase the concentration of these fatty acids in your body, then try reducing the amount to

two capsules daily. Consider adding a multi-antioxidant formula as well, such as Carlson's Aces or Aces Elite for even greater anti-inflammatory benefits.

2. *Carlson Very Finest Fish Oil*. This liquid fish oil (flavored with a hint of lemon or orange) provides 800 mg of EPA and 500 mg of DHA per teaspoon. Unlike other fish oil products, this one actually tastes good because of the slight lemon or orange flavor. Carlson sells a range of fish oil, salmon oil, and cod liver oil products in liquid and capsule form. (More details can be found at www.carlsonlabs.com.)
3. *Solgar Super GLA*. This is a high-potency supplement containing 300 mg of GLA per capsule. Many people benefit from large amounts of GLA, which can boost the anti-inflammatory activity of omega-3 fatty acids. The capsules have a slight citrus flavor and can be chewed. (More details can be found at www.solgar.com.)

How to Use Omega-3 Fish Oil Supplements

With all of the fish oil supplements on the market, it can be difficult to decide which brand to buy. As a general rule, I suggest that you opt for a brand that harvests fish from relatively pollution-free waters, such as those off the west coast of Norway. Some omega-3 supplements are derived from salmon, whereas others come from smaller fish, such as sardines and anchovies. Analyses by an independent testing laboratory (www.consumerlab.com) found that all of the omega-3 fish oil supplements tested were free of mercury. The mercury and other likely contaminants are removed during the extraction and refining of the fish oils.

Various fish oil supplements contain different ratios of EPA and DHA, with some being higher in EPA and others higher in DHA. Although EPA seems to have greater anti-inflammatory benefits, DHA should not be ignored. DHA promotes the production of resolvins and protectins, which have tremendous anti-inflammatory benefits, even though the body makes them in tiny quantities.

To reduce the risk of developing coronary heart disease and other inflammatory disorders, take at least 1 gram of omega-3 fish oil capsules daily. In most cases, this will be a single capsule. If you have any type of arthritis, take at least 3 grams daily and strive to eat coldwater fish (e.g., salmon, tuna, herring) once or twice a week. If you are taking a blood-thinning drug, such as aspirin or Coumadin, check with your physician because fish oils may further thin your blood.

Nelda: Fish Oil to Relieve Pain

At age sixty-three, Nelda displayed all the signs of rheumatoid arthritis. Her fingers, which hurt all the time, had become red and deformed. She was taking prescription pain relievers six to eight times daily, and her family physician suggested that it might be better to replace her right knee and left hip joints. Nelda was also taking nitroglycerin for her heart and a blood pressure–lowering medication.

She figured there had to be an alternative, so she visited Hugh D. Riordan, M.D., the president of the Center for the Improvement of Human Functioning International in Wichita, Kansas. Laboratory tests showed Nelda to be sensitive to some of her favorite foods, specifically dairy products and white potatoes, which she immediately stopped eating. She also began to take a number of anti-inflammatory supplements, including fish oils and antioxidant vitamins.

In less than a year Nelda was virtually pain-free and had regained flexibility in her fingers. She stood straight and no longer needed a cane or a walker. For the next twenty years Nelda remained active, healthier in her seventies and eighties than in her sixties.

Gamma-Linolenic Acid

Gamma-linolenic acid (GLA) is often misunderstood and undervalued for its anti-inflammatory benefits. Although GLA is part of the omega-6 family, it supports anti-inflammatory compounds in parallel with the omega-3s.

GLA supplements leapfrog the biochemical bottleneck caused by a weak or defective delta-6-desaturase enzyme, which would normally convert linoleic acid to GLA. The body quickly converts the GLA in supplements to dihomo-gamma-linolenic acid (DGLA), which is the “activated” form of GLA. At this point, DGLA can be converted either to pro-inflammatory arachidonic acid or to anti-inflammatory prostaglandin E₁. Meanwhile, EPA slows production of arachidonic acid, so as a consequence, GLA and DGLA further increase the activity of prostaglandin E₁. It’s important to remember the synergism of GLA and EPA—they have greater anti-inflammatory benefits together than either does by itself.

Because GLA supports the anti-inflammatory effects of prostaglandin E₁, it inhibits several promoters of inflammation, including tumor necrosis factor alpha, interleukin-1 beta, and the abnormal proliferation

of immune cells. Although the research on GLA might at times strike you as “miraculous,” particularly with respect to its benefits in the treatment of brain cancer, all of the benefits are actually related to correcting and improving the body’s metabolism of essential fats.

GLA Reduces Symptoms of Rheumatoid Arthritis

Several studies on people have found that GLA supplements dampen the destructive auto-immune activity that is characteristic of rheumatoid arthritis. In one of the clinical trials, Robert Zurier, M.D., of the University of Massachusetts, Worcester, treated thirty-seven patients with rheumatoid arthritis. He gave them either 1.4 grams of GLA or placebos daily for twenty-four weeks. By the end of the study, patients taking GLA had a 36 percent reduction in tender joints, and their overall score on tests measuring joint pain decreased by 45 percent.

The patients experienced other benefits as well. Overall, their number of swollen joints decreased by 28 percent, and the patients’ overall score for swollen joints fell by 41 percent. Some people benefited far more than did others, but that is often the case with single-nutrient studies. It is likely that a broader supplement regimen (including the omega-3s) would have led to even more improvements.

In another study, Zurier doubled the dosage of GLA, giving fifty-six patients either 2.8 grams daily of the supplement or placebos for six months. This higher dosage led to significant improvements—at least a 25 percent improvement in four of eight measures of rheumatoid arthritis severity. For a second six-month period, Zurier gave GLA to all of the patients, and improvements were noted across the board. The group that was originally given GLA continued to improve over the course of a full year, with more than three-fourths of the patients experiencing decreased arthritic symptoms.

GLA Eases Injuries and Inflammation

The synergism of GLA and the omega-3 fish oils has been clearly demonstrated by Søren Mavrogenis, the physical therapist for the Danish Olympic team. Since 1996, he has used high doses of both oils to treat Olympians and other elite athletes with inflammatory overuse injuries. (See an additional discussion on pages 139–140 and 203–204.) But the benefits also extend to average people, “weekend warrior” athletes, and others who occasionally overexert themselves.

Mavrogenis has used GLA and fish oils to treat hundreds of patients. In a study published in the journal *Physical Therapy in Sport*, he focused on forty recreational athletes who took either placebos or a proprietary combination of 640 mg of omega-3 fatty acids, 672 mg of GLA, and small amounts of antioxidants for one month. All of the subjects suffered from some type of tendonitis related to athletic injuries, and they also received physical therapy.

By the end of the month, people who took the supplements had an almost complete recovery from pain, and they were able to continue exercising during the treatment. Mavrogenis noted that most patients recovered within two to three weeks, although people with more severe injuries may take as long as two months.

GLA Is Helpful in Eliminating Psoriasis and Eczema

The skin contains a reservoir of fatty acids, which serves partly as a barrier that protects against moisture loss. In fact, one of the classic signs of a fatty-acid deficiency is dry skin. Studies have found that other skin problems, such as psoriasis and eczema, may be resolved with supplements of GLA. It is likely that a combination of GLA and omega-3 fish oils will yield even greater benefits.

Swiss researchers gave forty men and women supplements containing 345 mg of GLA or placebos daily for twelve weeks. Over the course of the study, the subjects' skin moisture, firmness, elasticity, and smoothness improved. A number of studies have looked at whether GLA might reduce eczema and psoriasis. Although the results were not entirely consistent, the beneficial amount of GLA tended to be 275 mg or more daily. Adding omega-3 fish oils and vitamin D will likely lead to greater improvements.

Joan: Vitamins and Psoriasis

Since her early twenties, Joan had suffered from psoriasis, which doctors treated with limited success over the years with a variety of medications. At age fifty-six, she consulted Richard P. Huemer, M.D., a nutritionally oriented physician in Lancaster, California. Huemer confirmed the original diagnosis of psoriasis, based on her characteristic skin lesions, measleslike rashing, and scaling.

He also diagnosed Joan with intestinal dysbiosis, which can result in myriad symptoms, including allergylike symptoms and skin disorders.

He recommended that Joan take digestive aid supplements, as well as vitamin C, vitamin E, and gamma-linolenic acid supplements. Huemer also suggested that she try homeopathic remedies, such as 6X graphites.

Joan's psoriasis improved over the next few months. After four months, she was pleased to report to Huemer that her friends had told her she no longer had any signs of psoriasis.

GLA May Help You Keep Off Excess Pounds

We know that trans fats interfere with the body's production of GLA and, as a consequence, promote the accumulation of fat around the belly. So, could GLA supplements correct the problem and help with weight loss? The answer is tentatively yes, based on a study of obese adults at the University of California, Davis.

Stephen D. Phinney, M.D., Ph.D., asked fifty obese patients, all of whom had recently lost substantial amounts of weight, to take either 890 mg of GLA or placebos daily for one year. Most of the patients taking GLA supplements regained far less weight than did those taking placebos. On average, people taking GLA supplements regained only 4 pounds, compared with an almost 17-pound weight gain among people taking placebos.

GLA May Have Therapeutic Benefits in Brain Cancer

The most innovative use of GLA is in the treatment of brain cancer, which is difficult to successfully treat with surgery or radiation. GLA's benefits may apply to other types of cancer as well. Having said this, I must add that GLA is a highly experimental therapy for brain cancer, and it does not appear to be available in U.S. hospitals.

In an article in *Medical Science Monitor*, Undurti N. Das, M.D., described cell, animal, and human studies in which GLA was used to treat various types of brain cancer. In the three human studies detailed by Das, GLA was injected directly into the brain tumors, with individual dosages of 0.5 to 1 mg and total dosages of GLA ranging from 4.5 to 20 mg over periods of up to twenty days. The GLA caused significant reductions in tumor size without the patients' experiencing significant side effects, and most of the patients were alive and well three years after their diagnoses (at the time that Das published his article). Survival was usually related to the size of the patient's tumor at the time of treatment.

In separate cell studies, researchers at the Northwestern University

School of Medicine, Chicago, found that GLA supplements can reduce the activity of Her-2, a gene that increases the aggressiveness of breast cancer. Women who have breast cancer and are also Her-2 positive are less likely to benefit from chemotherapy or hormone treatments to control cancer. GLA reduces Her-2 levels and, as a result, might improve the efficacy of other therapies.

How to Buy and Use GLA Supplements

GLA supplements are derived from borage, evening primrose, or black currant seeds. GLA constitutes about 20 percent of borage seed oil, 15 to 19 percent of black currant seed oil, and 9 percent of evening primrose oil. You may read that one source is better than another, but the plant source is not as important as the actual amount of GLA per capsule.

Many of the supplements are labeled “borage seed oil,” “black currant seed oil,” or “evening primrose oil,” and some companies try to obscure the actual amount of GLA in their products. The reason is that the seed oils are relatively inexpensive, but producing higher concentrations of GLA gets progressively more expensive. It is not uncommon to find products that provide, as an example, 1,000 mg of evening primrose oil but only 50 mg of GLA. Read the fine print to see how much actual GLA is in each capsule. Then calculate the daily amount that you want and what it will cost you.

A daily GLA dose of 100 to 200 mg should be adequate for most people and, again, it is important to take both GLA and fish oil supplements for their dual anti-inflammatory benefits. If you are trying to resolve an acute anti-inflammatory condition, such as a soft tissue (tendon or muscle) injury, increase the amount to 300 to 600 mg daily, and then try lowering the dose after one month. If you have a more severe inflammatory disease, such as rheumatoid arthritis, strive for 1.4 to 2.8 grams (1,400 to 2,800 mg) daily, which is what the studies have found to be effective. You can likely achieve equal or greater benefits, however, with a smaller amount of GLA combined with omega-3 fish oils.

Victor: Olympic Nutrition

Søren Mavrogenis, the physiotherapist for the Danish Olympic team, began to recommend a combination of omega-3 fatty acids, gamma-linolenic acid, and antioxidants in 1996. At the time, he had been treating the inflamed knee of a female rower but had not been able to help

her. Because of the side effects of nonsteroidal anti-inflammatory drugs (NSAIDs), Mavrogenis was reluctant to recommend them for long-term use.

Mavrogenis's conversations with health writer Bjørn Falck Madsen of Denmark and a researcher at a Scandinavian vitamin company led to his devising a specific supplement regimen. The rower started taking the supplements and was able to resume rowing within a few weeks. One success led to another, and today Mavrogenis routinely uses a combination of omega-3 fatty acids, gamma-linolenic acid, and antioxidants (brand name PharmaNord Bio-Sport), along with deep-muscle massage, to treat chronic overuse and inflammatory disorders. About one-third of his clinic's patients are elite athletes.

One of Mavrogenis's patients has been Victor A. Feddersen, a world-champion rower and an Olympic gold medalist in 1996. During training and competition, Feddersen suffered inflammatory injuries to his elbows. In the past he had to take a break from training and use NSAIDs. But for the last few years Feddersen has taken fatty acid and antioxidant supplements while also undergoing Mavrogenis's deep-muscle massage. It has made a big difference. Feddersen responds quickly to the supplements and has been able to continue training while he recuperates.

Other Danish Olympic athletes have benefited similarly with a variety of inflammatory injuries, including those of the shoulders, arms, legs, and Achilles' heel. In general, inflammation subsides about a month after the athletes start taking the supplements, but some people have responded within a week, while others need several months.

Olive Oil

Think of olive oil as one of the tastiest "supplements" you can eat. A common constituent of Greek and Italian diets, olive oil is rich in oleic acid, an omega-9 fatty acid. Many of the heart-healthy benefits of the traditional Mediterranean diet have been attributed to the abundant use of olive oil. Although other aspects of the diet (e.g., fruits, vegetables, and fish) are healthful, scientific studies have found olive oil to possess impressive anti-inflammatory properties in its own right.

Diets high in olive oil appear to reduce the likelihood of developing rheumatoid arthritis. Christos S. Mantzoros, M.D., D.Sc., of Harvard Medical School, and researchers from the Athens Medical School found that consumption of olive oil was associated with a 61 percent lower risk

of having rheumatoid arthritis. In another study, Parveen Yaqoob, Ph.D., a researcher at the University of Southampton, England, asked healthy middle-age men to follow either a conventional diet or one high in olive oil for two months. The men consuming extra olive oil had a specific type of “adhesion molecule” that was 20 percent less active. This adhesion molecule, known as ICAM-1, sustains inflammatory and allergic reactions. By reducing the activity of adhesion molecules, olive oil tempers inflammatory reactions.

How to Buy and Use Olive Oil

As was discussed in chapter 6, the best varieties of olive oil are “extra virgin,” because they are produced during the first mechanical pressing of olives. Pure or classic olive oil is also made from the first pressing, but it is slightly more acidic and can tolerate higher cooking temperatures. Light olive oil has been filtered to reduce its natural fragrance; it has no fewer calories than the other forms.

You should use olive oil exclusively or nearly exclusively as your cooking oil. Grapeseed oil is also rich in omega-9 fatty acids, but it is often produced through chemical extraction. Some mechanically pressed grapeseed oil is available, but you have to search for it in stores. While grapeseed oil is tolerant of very high temperatures, olive oil is still the preferred oil at home and in restaurants.

Other major food sources of omega-9 fatty acids are avocados and macadamia nuts. Both foods have been shown to reduce blood cholesterol levels, although their health benefits may be partly related to other nutrients.

In this chapter you have read how “good” fats can help restore a normal inflammatory response and, in doing so, reduce symptoms of rheumatoid arthritis, osteoarthritis, and other inflammatory disorders. These fats can also lower blood pressure and lessen your risk of developing heart disease and cancer. In the following chapter you will learn how various herbs are being used to fight inflammation.