One condition explains your stiff fingers, aching muscles, and arthritic joints. One condition lies at the root of your troublesome allergies and asthma. And one condition describes the underlying cause of heart disease, Alzheimer’s disease, and some types of cancer.

It is inflammation.

As you read this, medicine is rapidly redefining coronary artery (heart) disease, the leading cause of death among people in the United States and most other Westernized nations, as an inflammatory disease of the blood vessels. Physicians are quickly adopting a new and inexpensive blood test—high-sensitivity C-reactive protein—to measure their patients’ level of inflammation and risk of suffering a heart attack. And as the evidence mounts, physicians and medical researchers are recognizing that other major chronic diseases are fueled by inflammation as well.

Most of us understand inflammation as something that causes redness, tenderness, stiffness, and pain. It is the core of inflammatory “-itis” disease, and it also is intertwined in every disease, including obesity, diabetes, and multiple sclerosis.

Inflammation is why professional athletes and weekend warriors often develop muscle aches. It is why some people’s gums bleed whenever they brush their teeth. And it is why some people develop stomach ulcers.

Despite their different symptoms, all of these health problems are united by the same thread: they have runaway inflammation in common.

And as you may well realize, many people suffer from more than one
inflammatory disorder. This constellation of related diseases, such as the combination of heart disease, arthritis, and periodontitis, can best be described as the Inflammation Syndrome.

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**Estimated Number of North Americans with Some Inflammatory Diseases**

Millions of North Americans suffer from inflammatory disorders, some of which have only recently been recognized as inflammatory in nature:

- Allergic and nonallergic rhinitis: 39 million
- Asthma: 17 million
- Cardiovascular diseases: 60 million
- Arthritis (all types combined): 70 million
- Osteoarthritis: 21 million
- Rheumatoid arthritis: 2 million

Everyone experiences inflammation at one time or another, and we actually need it to survive. But chronic inflammation is a sign that something has gone seriously wrong with your health. Instead of protecting and healing, chronic inflammation breaks down your body and makes you older and more frail.

Most people treat inflammation with one or more over-the-counter or prescription drugs. At best these drugs temporarily mask the symptoms of inflammation, not treat its underlying causes. Worse, the side effects of these drugs can often be extraordinarily dangerous, causing weight gain, severe stomach pain, bone deformities, and heart failure.

Unfortunately, a physician’s diagnosis of many -itis diseases, such as dermatitis or gastritis, is often meaningless. The doctor might feel proud of his diagnosis, but it is merely a description of the symptoms, not of its cause.

To understand the cause of the modern epidemic of inflammatory diseases, we have to look at how the average person’s diet has deteriorated over the past two or three generations. The bottom line is that the foods you eat have a powerful bearing on your health and, specifically, inflammation.

How does food influence your inflammation, your aches and pains?
and part of the reason is related to inflammation. If you are overweight, you have a greater risk of developing adult-onset diabetes, which also has a strong inflammatory component. Inflammation in diabetes is related to being overweight, to having elevated blood sugar and insulin levels, and to consuming too many refined carbohydrates (such as white bread and sugary breakfast cereals).

The Inflammation Syndrome does not stop here. Having diabetes also increases the risk of periodontitis, a type of dental inflammation. Each of these disorders—overweight, diabetes, and periodontitis—is serious by itself. But as the inflammation in these disorders simmers year after year, it also increases the risk of coronary artery disease, which medicine has recently recognized as an inflammatory disease of the blood vessels. In a nutshell, each inflammatory disorder has an additive effect, increasing the body’s overall level of inflammation and the risk of very serious diseases.

Many other examples of the Inflammation Syndrome abound. Allergies stir up the inflammatory response, increasing the risk of rheumatoid arthritis, an autoimmune (self-allergic) disease. Infections also trigger an immune response, and chronic infections and inflammation account for an estimated 30 percent of cancers. Joint injuries frequently set an inflammatory response into motion, setting the stage for osteoarthritis. Serious head injuries and their resultant brain inflammation increase the long-term risk of Alzheimer’s disease, which is also being viewed by doctors as an inflammatory process affecting brain cells.

This is serious and scary stuff, and the stakes for your health are very high. But the point of this book is that chronic inflammation and the inflammation syndrome can be prevented and reversed. This book shows you how.

What Is Chronic Inflammation?
Inflammation assumes many different forms, and everyone experiences it at one time or another. Perhaps the most common type of inflammation is sudden and acute, such as when you burn yourself in the kitchen, overuse muscles when moving furniture, or injure tendons when playing sports. The injured area swells, turns red, and becomes tender to touch.

Under normal circumstances inflammation helps you heal, and it can even save your life. For example, if you accidentally cut your finger with a knife, bacteria from the knife, air, or surface of your skin immediately
the beginning of a gradual exercise program, with walking and riding a stationary bicycle.

Two months after Georgia’s first visit to Ivker, she had a new vitality and higher energy levels. She also had lost five pounds. Over the next year or so she was able to stop using all of her medications. Recognizing the role of emotion in illness, Ivker asked Georgia to focus on strengthening her family relationships. Today, with her newfound health, Georgia and her husband are planning for an active retirement.

**Inflammation Triggers**

Physicians and patients alike routinely confuse the *causes* of inflammation with its *triggers*. The causes of inflammation are often related to dietary imbalances or deficiencies, which prime the immune system for a powerful and chronic inflammatory reaction.

In contrast, inflammation triggers are the events that precipitate a specific inflammatory response *after* the body is already primed for an overreaction. Although it is not the same as rectifying the causes of inflammation, it is very important to avoid events that trigger inflammation. Doing so helps settle down an easily agitated immune system.

First, try to reduce your exposure to inflammation triggers. For example, if you have food allergies, make a point of avoiding troublesome foods. Similarly, if you are a weekend-warrior athlete who frequently gets injured, it might be good to take up a more moderate and regular physical activity, such as swimming or walking. Repeated injuries keep revving up the body’s inflammatory response.

Second, it is important to dampen the immune response to unavoidable triggers (e.g., seasonal pollen allergies). And third, it would be ideal to normalize the immune response to inflammation triggers. The second and third approaches rely chiefly on dietary changes and nutritional supplements, and these approaches are discussed in depth in later chapters.

For now, there are six general categories of inflammatory triggers to understand.

1. **Age-Related Wear and Tear: What Is Your Biological Age?**

   Every living creature ages, and age is characterized by less biological efficiency and an accelerated breakdown of tissue and normal biochemical processes. When tissues break down white blood cells are mobilized to clean up, in a manner of speaking, the biological dust. The aging process
occurs at individual rates of speed and is influenced by a variety of factors, including genetics, diet, frequency of infections, stress, and overall lifestyle. Of particular interest, levels of the body’s key pro-inflammatory substances generally increase with age. This rise may be due to age-related tissue breakdown—and the immune system’s response to it—or perhaps to the long-term effect of eating a pro-inflammatory diet.

Although most of us think of our age chronologically, our biological age is actually far more important. Chronological age refers to how many years old a person is, whereas biological age assesses age in terms of physical and mental performance. Many people in their seventies and eighties have more vigor and better health than do people half their age. Some researchers have noted that healthy centenarians are not simply healthy old people. They are often healthier than younger seniors and in many ways on a par with people in their forties.

One way to maintain a lower biological age is to reduce tissue breakdown and the inflammation it stimulates. In a general way, diets rich in vegetables and fruits provide large quantities of antioxidants, such as vitamin C, carotenoids, and flavonoids. These antioxidants neutralize damaging free radicals. For example, people who eat large amounts of antioxidant-rich vegetables develop fewer wrinkles and look younger. In a more specific example, many people take glucosamine sulfate supplements, which help maintain “younger” joints and reduce the pain of osteoarthritis.

2. Physical Injuries

Physical injuries can accelerate the aging of specific tissues, such as joints, muscles, and bone. Many such injuries, such as falling and breaking a bone, or musculoskeletal athletic injuries, can become the source of painful and debilitating lifelong health problems. Former heavyweight boxing champion Muhammed Ali, who was physically and mentally agile as a young man, developed Parkinson’s disease as a consequence of cumulative brain damage in the ring. These injuries become sources of chronic inflammation and pain because they are initially serious, repeated, do not heal properly, or promote sustained low-grade inflammation in the damaged tissues.

To minimize your chances of suffering a physical injury, you have to be careful of reckless behavior. For example, it’s smart to drive defensively and to watch where you step, so you reduce the risk of tripping. As you reach middle age it may be better to adopt low-impact activities, such as swimming or walking.
calories or too many carbohydrates—is a risk factor for many diseases, such as heart disease, cancer, diabetes, and osteoarthritis. The type of fat cells that develop around the abdomen generate large amounts of powerful inflammatory substances, such as C-reactive protein. Yes, obesity is an inflammatory disease.

An imbalance of dietary fats is a major promoter of inflammation. Many of the inflammation-sustaining fats are found in common cooking oils and packaged foods. When a balance of dietary fats is restored, through diet and supplements, the body regains its natural ability to both turn on and turn off inflammation.

Elevated blood sugar (glucose) levels, stemming from a diet with too many refined carbohydrates and sugars, also can increase inflammation in the body. People with insulin resistance commonly have high levels of C-reactive protein, a sign of inflammation. Insulin resistance is at the heart of Syndrome X and type 2 diabetes. Syndrome X, which increases the risk of both diabetes and heart disease, is also marked by fat around the waist, high blood pressure, and high cholesterol and triglycerides. For more information on Syndrome X see my earlier book Syndrome X.

The next chapter explains what happens during an inflammatory reaction, how the body makes powerful inflammation-producing substances from foods, and why some foods make us overreact to inflammation triggers.
Anti-Inflammatory Firefighters

Three specific types of fats, as well as antioxidant nutrients, help control inflammation. Here is a brief overview of them.

- The omega-3 family of fatty acids supplies the building blocks of a variety of powerful anti-inflammatory substances. The parent fat of the omega-3s, alpha-linolenic acid, is found in dark green leafy vegetables and flaxseed. More potent omega-3s, especially EPA (eicosapentaenoic acid), are found in coldwater fish such as salmon and herring. Basically, the omega-3s encourage the body’s production of inflammation-suppressing compounds. They help remind the body to turn inflammatory reactions off when they are no longer needed.

- GLA (gamma-linolenic acid) is technically an omega-6 fatty acid, but it behaves more like an anti-inflammatory omega-3. It enhances the inflammation-suppressing effect of omega-3s.

- The omega-9 family of fatty acids works with the omega-3s as anti-inflammatory compounds. They are found in olive oil, avocados, macadamia nuts, and macadamia nut oil.

- Antioxidants such as vitamins E and C are particular types of nutrients that neutralize free radicals and help quell inflammatory reactions.

The Pro-Inflammatory Pathway

Linoleic acid, the basis of all the other omega-6 fatty acids, is essential for health. However, the modern diet provides far too much of it, shifting our bodies toward chronic inflammation. The widespread use of vegetable cooking oils—in kitchens, restaurants, and packaged foods—is a principal reason for the prevalence of inflammatory disorders. As but one illustration, a study in the January 2002 American Journal of Clinical Nutrition showed that the omega-6 fats in vegetable oils increased inflammation in heart cells.

The body converts linoleic acid to a series of more powerful compounds. Chief among them is arachidonic acid, which is subsequently converted into a variety of very powerful inflammation-causing compounds known as eicosanoids. Eicosanoids include such substances as prostaglandin E₂.
that very modest chronic increases in blood sugar, even when in the normal range, significantly increase the risk of developing diabetes or heart disease within just a few years. Both diseases have inflammatory undercurrents, and elevations in blood sugar spontaneously generate free radicals, which can stimulate inflammation.

**Humans Need Vitamins, Minerals, and Phytonutrients**

Over the course of a year Paleolithic peoples and hunter-gatherer societies typically consumed more than a hundred different types of plants. These were very different foods from what most people consume today. Ancient uncultivated vegetables were more akin to nutrient-packed kale than to iceberg lettuce, and uncultivated fruit looked more like crabapples and rose hips than supersweet pears and bananas.

Only 9 to 32 percent of North Americans consume the five daily servings of vegetables and fruit recommended by the federal government, meaning that 68 to 91 percent of Americans do not have a particularly rich dietary source of vitamins and other nutrients. Of those people who do eat vegetables and fruit, most choose from a limited selection, such as potatoes, which are often fried; corn; peas; carrots; and iceberg lettuce. As a consequence, most people today fall far short of the greater quantity and diversity of vitamins, minerals, and phytonutrients consumed by Paleolithic people and hunter-gatherers.

Based on the calculations by Eaton and Cordain, Paleolithic peoples consumed an average of two to ten times more vitamins and minerals than people do today. These levels range from three to six times the federal government’s Recommended Dietary Allowance (or Daily Value) for vitamins and minerals. For example, a Paleolithic person likely ate about 600 mg of vitamin C daily, compared with an RDA of 60 mg, and a typical North American daily intake of 45 mg or less daily.

In addition, vegetables and fruit contain large amounts of vitaminlike antioxidant nutrients, particularly flavonoids and carotenoids. A diet containing a diverse selection of vegetables and fruit would likely provide hundreds of flavonoids and dozens of carotenoids. Researchers estimate that people nowadays consume between 23 and 170 mg of flavonoids daily, but that they may have consumed five to twenty-four times more (115 to 4,080 mg daily) in the past. Such a huge dietary intake of antioxidants—now missing from most people’s diets—would moderate inflammatory reactions.
The Agricultural Revolution

The first major changes to the diet—that is, departures from lean meat, fish, and plant foods—occurred approximately ten thousand years ago with the development of agriculture, the domestication of livestock, and the use of milk and other dairy products. Agriculture stabilized the movement of hunter-gatherer societies, which eventually led to the growth of cities and the development of complex cultures. But the use of grains also led to health problems that were not immediately evident.

The cultivation and consumption of grains introduced the protein gluten to the diet of humans. Gluten is an umbrella term for forty related proteins in a handful of grains, particularly wheat, rye, and barley. You might think that a new vegetarian source of protein would be good, but gluten has been a mixed blessing.

Many people—approximately one in every hundred—are allergic to gluten, causing what is known as celiac disease. In these people, eating gluten triggers an immune (inflammatory) response, which primarily attacks the gastrointestinal tract and interferes with vitamin and mineral absorption. Archeologists have noted that the health of humans, based largely on analysis of ancient bones, took a turn for the worse after gluten-containing grains became popular foods. Osteoporosis, arthritis, and even birth defects became more common after people began eating grains.

The health effects of gluten proteins in grains may be problematic for many people who do not have an inborn sensitivity to gluten. According to Melissa Diane Smith, a nutritionist and author of *Going Against the Grain*, half of Westerners may be sensitive to gluten without exhibiting any of the traditional symptoms of celiac disease. Instead, gluten sensitivity may appear as immunological reactions affecting the nervous system, balance, and behavior, as well as a person’s overall sense of well-being. According to Smith, a second family of grain (and legume) proteins, called lectins, may also damage the gut and interfere with nutrient absorption. Meanwhile, Loren Cordain’s research has shown that lectins play a role in rheumatoid arthritis and possibly other inflammatory autoimmune diseases. The bottom line is that most grains are neither the much-heralded staff of life nor the breakfast of champions.

Ten millennia ago—too short of a time for genetic evolution—people also began domesticating livestock for meat and, in the case of cows and goats, for milk and other dairy products. As long as livestock were exclusively grass-fed, their meat and milk yielded a balance of pro- and anti-inflammatory fatty acids. This changed when animals were fed corn,
which, as previously noted, increases the animals’ overall fat and saturated fat and reduces anti-inflammatory omega-3 fatty acids.

Many people have questioned the health benefits of cow’s milk, but a couple of points are especially relevant in the context of our evolutionary diet. One is that no species, other than humans over the past ten thousand years, has ever consumed milk beyond infancy. Another is that no species other than humans has ever consumed the milk of another mammal. Like grains, cow’s milk appears to be a mismatch for our genetic heritage. The situation is made worse today because milk products from grain-fed cows contain no appreciable amounts of omega-3 fatty acids.

The Industrial Revolution

Many dietary changes occurred over the next ten millennia, including greater cultivation of vegetables and fruit, which increased the sugar con-
Melinda feeling tired much of the time. The NSAID caused a painful gastric ulcer, which was treated by a drug to reduce stomach acid.

The medications and Melinda’s weight gain substantially increased her risk of heart disease and, particularly, heart failure (a catastrophic weakening of the heart muscle). Melinda’s physician tried to head off the damage, but he relied solely on pharmaceutical treatment and never discussed nutrition or an anti-inflammatory diet with her. Two years later, after a battery of laboratory tests, he noted that her C-reactive protein levels were elevated, a sign of serious inflammation, so he prescribed a cholesterol-lowering “statin” drug to reduce her risk of heart disease.

The statin drug lowered Melinda’s cholesterol, but it also reduced her body’s production of coenzyme Q₁₀, a vitaminlike substance needed for normal heart function. Both the statin and the NSAID increased her risk of heart failure. As Melinda’s heart function declined, her physician prescribed one more drug to stimulate the heart.

Sadly, her downward spiral could not be stopped. Melinda died of heart failure at age thirty-nine, even though her symptoms could have been reversed by diet and safe nutritional supplements.

With dozens of over-the-counter and prescription anti-inflammatory drugs on the market, you might think that the cure for your aches and pains is as near as the corner pharmacy. Many of these drugs, such as aspirin and ibuprofen, provide relief to millions of people around the world. But these and other drugs have a dark side that, perhaps in the majority of cases, outweighs their benefits. In this chapter we will look at the hazards of several classes of anti-inflammatory drugs.

**Anti-Inflammatory Drugs and Their Hazards**

Pharmaceutical drugs, used appropriately and for short periods of time, can quickly relieve pain and inflammation. However, they are anything but magic bullets. The longer such drugs are used, and this is the case with chronic inflammatory diseases, the greater the risk of serious side effects.

Drug companies market more than 30 different types of NSAIDs, the most widely used class of drugs. Many other drugs also are used to treat inflammation, and 250 are sold for the treatment of arthritis alone. Each year, pharmacists in the United States fill more than 70 million prescriptions for NSAIDs, and consumers buy about 30 billion over-the-counter...
**Cox-2 Inhibitors**

With the discovery of two forms of cyclooxygenase, and the belief that only Cox-2 was involved in inflammation, several pharmaceutical companies began massive research projects to develop a new generation of Cox-2 inhibitors. In theory, these drugs would stop inflammation by suppressing Cox-2 activity, but avoid gastrointestinal side effects associated with inhibition of Cox-1.

Celebrex and Vioxx were the first “selective” Cox-2 inhibitors. But the new generation of Cox-2 inhibitors (often referred to as “coxibs”) was only 20 percent selective for Cox-2. In other words they were 80 percent, just like traditional NSAIDs. Coxibs were no more effective therapeutically and no safer than earlier NSAIDs.

One study, testing Vioxx against naproxen, found that the Cox-2 inhibitor increased the incidence of heart attack by four times, compared with the older NSAID. A recent analysis of four studies of Cox-2 inhibitors confirmed that this new class of drugs increases the risk of heart attack and stroke, according to an article in the *Journal of the American Medical Association*.

The problems run even deeper. The drug companies assumed that only Cox-2, not Cox-1, was involved in inflammatory reactions. It now appears that both Cox-1 and Cox-2 play fundamental housekeeping roles in cells and normal health, and both also have roles in inflammation. In other words the very theory behind the development of selective coxibs may well have been wrong.

Researchers have recently discovered that Cox-2 has diverse fundamental roles in human biology, aside from its place in eicosanoid production. Like Cox-1, Cox-2 is involved in maintaining the integrity of the stomach wall, as well as in normal kidney and blood platelet function. Cox-2 also appears to be active in brain development, activity, and memory. It also is involved in ovulation and implantation of the egg into the womb. So it should come as no surprise that suppression of Cox-2 leads to undesirable side effects. It is likely that other undesirable side effects will emerge after the second generation of Cox-2 inhibitors reach the marketplace.

**CRP-Lowering Agents**

C-reactive protein (CRP) has long been recognized as an indicator of intense, systemic (bodywide) inflammation. Slowly, experts have come to see CRP as a promoter of inflammation, instead of simply as a marker.
In the late 1990s Paul M. Ridker, M.D., of Harvard Medical School, found that elevated blood levels of CRP increased the risk of heart attack by 4.5 times, a relationship far stronger than that between cholesterol or homocysteine and heart disease. Other research teams have found that elevated CRP levels are associated with Alzheimer’s, arthritis, cancer, diabetes, overweight, asthma, and many other inflammatory diseases. The body makes CRP from interleukin-6, one of the most pro-inflammatory of all cytokines. Although some CRP is made in the liver, an organ best described as the body’s chemical processing factor, large amounts also are made by abdominal fat cells.

Although many studies have found that vitamin E and other nutrients significantly reduce CRP levels, several major pharmaceutical trials have begun positioning “statin” drugs as the therapy of choice for lowering CRP levels. The statin drugs, which include Lipitor (atorvastatin), Mevacor (lovastatin), Pravachol (pravastatin), Zocor (simvastatin), Baycol (cerivastatin), and the more recent Bextra (valdecoxib), have been the most common medical treatments for lowering CRP level.

Despite their popularity and a common perception of safety, statins pose serious risks. They reduce the body’s production of cholesterol by inhibiting an enzyme known as HMG-CoA-reductase. This enzyme is active early in a series of biochemical reactions that eventually leads to the production of cholesterol (which, by the way, is the core molecule in all of the body’s steroid hormones, including estrogen, testosterone, and corticosteroids). The problem is that statins also turn off the body’s production of all the other compounds that depend on HMG-CoA-reductase.

One of these downstream compounds is coenzyme Q₁₀ (CoQ₁₀). CoQ₁₀ is a vitaminlike substance that plays a pivotal role in how the body’s cells produce energy. CoQ₁₀ is so crucial to health that research on it formed the basis of the 1978 Nobel Prize in chemistry. A small number of cardiologists in the United States and Europe, and far more in Japan, have successfully used large amounts (approximately 400 mg daily) of supplemental CoQ₁₀ to treat cardiomyopathy and heart failure, diseases characterized by a catastrophic loss of energy in heart cells.

All of these findings should raise red flags about the use of statins in lowering cholesterol and, now, in lowering CRP levels. One common side effect of statins is muscle weakness, significant because muscle cells (particularly the heart) contain the largest amounts of CoQ₁₀. In August 2001 Bayer A.G., a giant German pharmaceutical company, withdrew its Baycol statin drug from the marketplace. Thirty-one patients had died while
PART II

The Anti-Inflammation Syndrome Diet Plan
If you eat beef, is hamburger your favorite type?  
*Add 1 point*  

Do you order soft drinks when you eat out?  
*Add 1 point*  

Your score on quiz 2:  

**Interpretation and ranking:**

0–2 Low. You are eating a low-inflammation diet, which is the best way to protect yourself from chronic inflammation.  

3–5 Moderate. You are eating a moderate-inflammation diet, which may set the stage for chronic inflammation.  

6–19 High. You are eating a high-inflammation diet, which substantially increases your risk of inflammatory diseases.  

20+ Very high. You are eating a very high inflammation diet, which greatly increases your risk of disease.  

**High or very high on quiz 2 but not quiz 1 (pp. 13–15):** You are at risk for developing inflammatory carcasses in the coming years. This would be a good time to bolster your long-term health.  

**High or very high on both quiz 1 and quiz 2:** You likely have a high level of inflammation. The reason is probably that you are eating too many pro-inflammatory foods. You would do well to go on the Anti-Inflammation Syndrome Diet Plan and take steps to improve your long-term health.  

**High or very high on quiz 1 but not quiz 2:** You have probably adopted a very good diet but may have to further fine-tune your diet and supplement program.  

Now that you understand how the modern diet sets the stage for abnormally strong inflammatory reactions, you can focus on eating anti-inflammatory and neutral foods. The best anti-inflammatory foods are fish, especially cold-water varieties such as salmon, and a diverse selection of vegetables. The old adage “Eat a lot of color” definitely applies here because, to a great extent, bright and deep colors often indicate the presence of natural anti-inflammatory nutrients.  

In this chapter you will read about fifteen anti-inflammation dietary steps to follow while cooking at home or eating out. These steps form the foundation of the Anti-Inflammation Syndrome Diet Plan. Don’t worry
7. Avoid conventional cooking oils such as corn, safflower, sunflower, and soybean oil, as well as vegetable shortening, margarine, and partially hydrogenated oils.
8. Identify and avoid food allergens.
9. Avoid or strictly limit your intake of food products that contain sugars, such as sucrose or high-fructose corn syrup.
10. Avoid or limit your intake of refined grains.
11. Limit your intake of dairy products.
12. Snack on nuts and seeds.
13. When thirsty, drink water.
14. Whenever possible, buy and eat organically raised foods.
15. To lose weight, reduce both carbohydrates and calories.

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The Anti-Inflammation Syndrome Step 1: Eat a Variety of Fresh and Whole Foods

Most of the following steps are more precise versions of this first one: eat a variety of fresh and whole foods. These are foods that are in or close to their original state. They have not been processed or altered beyond refrigeration, kitchen preparation, and cooking. In other words such foods look pretty much the way they did in nature (which is not how processed foods look). A couple of examples should help clarify the meaning of fresh and whole foods.

A freshly broiled piece of fish looks, smells, and tastes like a piece of fish. It is very different from breaded and deep-fried fish, which is coated in refined flour and then cooked in a mix of vegetable and partially hydrogenated vegetable oils.

A piece of baked chicken still looks like a part of a chicken, which breaded and deep-fried chicken nuggets do not.

A carrot looks like a carrot, which carrot juice (devoid of fiber) does not.

An apple looks like an apple, which applesauce and apple juice do not.

A baked potato looks like a potato, which French fries (boiled in hydrogenated or oxidized oils) do not.

In practice, avoid any food that does not resemble what it looked like as it was growing or being raised. (The exceptions are foods that have just been cut up or prepared in a food processor or blender.) Following this principle means that you will have to strictly limit foods sold in boxes,
cans, jars, and bottles—often, even those sold in health and natural-food stores. The reason is that boxing, canning, and bottling usually indicate some sort of processing or alteration from the food’s original state, plus the addition of unwanted ingredients such as sugars, refined grains, most oils, flavor enhancers, texturizers, and more. Canned vegetables may or may not have added sugar; regardless, they are less nutritious than frozen, and frozen vegetables are usually less nutritious than fresh.

So as you stare into your cupboard, you must be wondering what you will eat. It’s simple: fresh (or frozen) fish, lean meats, spices and herbs for seasoning, lots of vegetables, and some fruit. Such foods are straightforward, uncomplicated, and easy to prepare and vary.

The Anti-Inflammation Syndrome Step 2: Eat More Fish, Especially Cold-Water Varieties

Cold-water fish contain the largest amounts of the most biologically active, “preformed” omega-3 fatty acids. Preformed means that the fatty acids exist as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), and the body does not have to make them from alpha-linolenic acid. This shortcut enables your body to put the anti-inflammatory properties of EPA and DHA to work right away.

An ideal amount of dietary omega-3 fatty acids is about 7 grams a week, which you can obtain in two to three servings of fish. Of course, eating fish more often is even better, particularly during the first couple months of the Anti-Inflammation Syndrome Diet Plan. (Fish oil supplements, which will be discussed in chapter 8, also can rapidly boost your intake of EPA and DHA.)

The fish with the highest concentrations of omega-3 fatty acids are mackerel, Pacific herring, anchovy, lake trout, king salmon, and Atlantic salmon. Tuna, halibut, cod, sole, snapper, crab, and shrimp contain smaller quantities of omega-3 fatty acids, but they are still healthy. Wild salmon contains a higher portion of anti-inflammatory omega-3 fatty acids compared with farmed salmon. All types of Alaskan salmon—including king, coho, and sokeye—are always wild. By 2004, labeling laws will require distributors to identify whether the salmon was wild or farmed.

Although fresh fish is always better (and smells less fishy) than frozen, most fish is delivered frozen to supermarkets. You may be broil, bake, poach, grill, or pan fry the fish in olive oil (and you should specify one of these when ordering in restaurants). Never eat breadcrumbed and deep-fried fish. The breading adds empty calories, and the frying saturates the breading.
As an alternative to olive oil if you want a cooking oil with a different taste, cold pressed macadamia nut oil is a good substitute. Macadamia nut oil is rich in anti-inflammatory oleic acid, the same omega-9 fat found in olive oil. Australian Mac Nut oil is an excellent product. (See appendix B.) It has a high smoke point, so you can cook with it at higher temperatures than you could with olive oil.

Several other oils or fats in small amounts can be used as well. A little butter adds a nice flavor to many meals, and its saturated fat should not pose a problem as long as you are consuming large amounts of omega-3 fatty acids. Grapeseed oil and canola oil also contain omega-9 and omega-3 fatty acids, and they withstand high cooking temperatures very well. However, most grapeseed and canola oils are obtained through chemical extraction (in contrast to mechanical pressing), which may leave trace amounts of solvents in the oils. Look more carefully in grocery stores and you will likely find mechanically pressed grapeseed and canola oils—although olive oil is still preferable to them.

Do not heat flaxseed or fish oils, and do not use them to cook foods. High temperatures rapidly oxidize and break them down, leading to the formation of pro-inflammatory free radicals. It is all right, of course, to cook fish because its mass resists those high temperatures unless, of course, you happen to overcook or burn it.

The Anti-Inflammation Syndrome Step 7:
Avoid Conventional Cooking Oils

Conventional cooking oils, such as corn, peanut, safflower, soybean, sunflower, and cottonseed oils, are high in pro-inflammatory omega-6 fatty acids and contain virtually no anti-inflammatory omega-3 or omega-9 fatty acids. These oils are commonly used in an enormous number of processed and packaged foods, including microwave meals, breakfast bars, salad dressings, and in many restaurants. The extensive use of these cooking oils is largely why the modern diet contains twenty to thirty times more pro-inflammatory than anti-inflammatory oils.

The worst oils are partially hydrogenated vegetable oils. All partially hydrogenated oils contain trans fatty acids, which are considerably more dangerous than saturated fats. Vegetable shortenings and hard margarines are among the worst of such products, but you will find partially hydrogenated oils in salad dressings, nondairy creamers, bakery products, and many processed foods.

It is always wise to carefully read the label of a food package. You are
Eating according to the Anti-Inflammation Syndrome Diet Plan will likely lead to some weight loss. This is because the diet discourages the use of convenience and fast foods, which contain large amounts of calories and carbohydrates relative to protein, vitamins, minerals, good fats, and fiber. Another reason is that calories from anti-inflammatory omega-3 and omega-9 fatty acids are not converted to body fat as readily as calories from omega-6 fatty acids and saturated fats.

Still, you may wish to further reduce your weight on the Anti-Inflammation Syndrome Diet Plan. You can accomplish this by modifying the diet plan so it is a little more consistent with the weight-loss recommendations in my previous book *Syndrome X: The Complete Nutritional Program to Prevent and Reverse Insulin Resistance*. Some compelling research suggests that the worst possible diet (in terms of Syndrome X, diabetes, and weight gain) is one high in both refined carbohydrates and saturated fats—that is, the typical American diet. So the reasonable alternative is an anti-inflammatory diet that further restricts carbohydrates and saturated fats.

To put these ideas into practice and to lose weight, you will need to eliminate all or nearly all grain-based foods, including whole grains, since these foods (as well as foods with refined sugars) are the principal source of dietary calories and carbohydrates. This is easier than you might think. I lost twenty pounds and four inches from my waist after giving up pasta.) In addition, you might curtail your intake of legumes, because they also contain substantial amounts of carbohydrates.

Although these recommendations have similarities to the Atkins diet, they are very different. It is important to replace these grain- and legume-based carbohydrates with ample quantities of nonstarchy or low-starch vegetables and fruit. Such foods include spinach, broccoli, cauliflower, lettuces, tomatoes, cucumbers, apples, and berries. Basically, one large salad daily (with an olive oil dressing) and sides of vegetables or fruit with lunch and dinner should provide modest amounts of carbohydrates and respectable quantities of fiber. To lower your intake of saturated fat, eat less beef, pork, and lamb, but increase your consumption of fish, chicken, and turkey.

Physical activity is important as well. Numerous studies have found that going for a walk each day improves insulin function and lowers blood sugar levels, which also contribute to maintaining normal weight. Going for a thirty-minute walk each day is sufficient, though longer walks and more vigorous exercise will yield greater benefits. If you engage in regular exercise, bear in mind that muscle weighs more than fat.
By following most or all of the anti-inflammation dietary steps, you will find that it is relatively easy to order healthy meals in many restaurants. However, you may be wondering about what to cook at home. This chapter offers a number of recipes for breakfast, lunch, and dinner, as well as a sample seven-day menu plan. This menu plan is merely a guideline and is not meant as a strict rule for what you must eat on any given day. Overall, this chapter takes a very positive approach to food selection, emphasizing what you should eat instead of what you should not.

Unlike many diet plans that are extremely rigid, the Anti-Inflammation Syndrome Diet Plan encourages flexibility and creativity in cooking and food choices. Inflexible dietary regimens can, for many people, become difficult to follow, and such plans often beg to be violated. So, in following the recipes in this chapter, please feel comfortable adjusting quantities, particularly of spices, to suit your personal tastes.

It is worthwhile keeping several guidelines in mind when preparing anti-inflammatory meals at home.

1. You will have to plan some of your major meals generally one to two days in advance. Poor meal planning has become very common and, combined with hunger pangs, often leads to picking the fastest meal
Dinner Main Courses

Baked Salmon (Serves 2)

- olive oil
- 2 salmon fillets, about 4 to 6 ounces each
- basil, to taste
- oregano, to taste
- 1 to 3 teaspoons balsamic vinaigrette, to taste

Preheat the oven to 350 degrees.

Coat the bottom of a baking dish with olive oil. Rinse and pat excess water off the salmon, and place them in the baking dish. Apply a thin coat of olive oil on top of the fillets (to add flavor and to prevent burning). Sprinkle basil and oregano to taste on the fillets. Drizzle the balsamic vinaigrette on the fillets. Bake for approximately 10 minutes. The cooking time may vary by a couple of minutes, depending on the oven and thickness of the fillets, so examine after 8 minutes to ensure that they are not burning or undercooked. The baked salmon goes well with Spinach and Leek Sauté (page 89) and Flavorful Brown Rice (page 89).

Pumpkin Seed Crusted Halibut (Serves 2)

- ½ teaspoon coriander
- ¼ cup raw pumpkin seeds, chopped
- ¼ cup olive oil
- 1 pound halibut, cut into two pieces
- 2 pats butter
- 1 lemon
- 1 tablespoon parsley

Preheat the oven to 350 degrees.

Add the coriander to the pumpkin seeds, then chop the seeds in a
Ratatouille Filling recipe (page 95). Please note: If you react to all nightshade plants, this is not a recipe you should try.

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**Tomato-Free Ratatouille** *(Serves 2–3)*

\[ \frac{1}{4} \text{ to } \frac{1}{2} \text{ cup olive oil} \]
2 small or 1 large eggplant, diced
1 large bell pepper, or the equivalent from several colored varieties, diced
2 zucchinis, each about 10 inches long, diced
1 medium red or sweet onion, diced
1 to 2 teaspoons thyme
1 to 2 teaspoons basil
1 bay leaf
4 garlic cloves, finely diced
3 to 4 ripe tomatillos (should have a yellow-green lime color), diced
RealSalt or sea salt, to taste

Pour about \( \frac{1}{4} \) cup of olive oil into a pan. Turn the heat to medium. When the olive oil is warm, add the eggplant, stirring occasionally. The eggplant will soak up the olive oil, but keep the pan covered to retain moisture. Add the bell pepper, zucchinis, and onion. After a few minutes, add the thyme, basil, bay leaf, garlic, and tomatillos. Stir occasionally to keep the vegetables from burning, and keep covered when not stirring. Add a little more olive oil if necessary. Turn the heat down and allow to simmer for about 40 minutes or until all of the vegetables are very soft. Add RealSalt or sea salt. Dispose of the bay leaf before serving.

**Green Bean and Mushroom Stir-Fry** *(Serves 2)*

pat of butter
2 tablespoons olive oil
2 handfuls fresh or frozen green beans, ideally French cut
4 to 5 fresh mushrooms, sliced
garlic powder, to taste
\( \frac{1}{4} \) cup sliced almonds
PART III

The Anti-Inflammation Syndrome
Supplement Plan

Preview from Notesale.co.uk
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gist told her she had some (but not all) of the signs of lupus erythematosus. She was developing stomach pain from the ibuprofen, and medication for the lupuslike symptoms caused double vision. In addition, 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. Hutt, N.D., a naturopathic physician in Tucson, Arizona. After a workup Hutt asked Anita to eat a simple, wholesome diet similar to the Anti-Inflammation Syndrome Diet Plan. Anita began eating more fish, chicken, turkey, and vegetables, while avoiding processed foods, soft drinks, coffee, and dairy products. Hutt 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 increasing. 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**

As you read in chapter 3, the omega-3 family of fatty acids forms the building blocks of many of the body’s natural anti-inflammatory compounds. Fish oil supplements, which are typically produced from salmon oil, are especially rich in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Although both fatty acids are essential for health, EPA plays a more important role in the body’s defenses against inflammation.

The advantage of taking fish oil or salmon oil capsules is simple: your body does not have to go through the many steps involved in converting alpha-linolenic acid (found in leafy green vegetables and flaxseed) to EPA and DHA. By taking capsules, you can leapfrog these steps and the poten-
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 its 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 eat either a conventional diet or one high in olive oil for two months. The men eating extra olive oil had a specific “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 also is 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 also is 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, though their health benefits may be partly related to other nutrients.
cats, and sneezed literally a hundred times a day. He became interested in nutritional medicine, cured himself of all of his nasal and respiratory problems, and has gone on to become one of the most original and eclectic thinkers in “orthomolecular medicine,” which focuses on using nutrition to achieve optimal health.

One patient, Susan, had high blood pressure much of her adult life but opted not to treat it medically. By her late sixties she had undergone a triple coronary-artery bypass. She consulted Dr. Kunin after repeated attacks of angina (heart pain), arrhythmias after exercising, muscle aches, postoperative memory loss, bronchitis, and coughing. Memory loss is common after bypass surgery, and Susan had difficulty recalling her recent medical history.

Based on Susan’s medical history and laboratory tests, Kunin diagnosed her high prothrombin (blood clotting) activity and that it was likely the result of a genetic propensity toward excessive blood clotting. He also felt that Susan’s muscle aches were the result of the statin drug interfering with her body’s production of coenzyme Q10, a vitaminlike substance needed for energy production in muscle cells.

Susan also had an acute sense of smell, which Kunin recognized as a likely sign of chemical sensitivity. The most likely culprit was Susan’s forced-air gas furnace. Such furnaces, as well as gas stoves, release burned hydrocarbons into the air, and sensitive people react to these compounds. Kunin recommended that she replace the filter and update her heating system.

Kunin then developed an antioxidant and anticoagulant regimen for Susan to follow, based in part on the fact that vitamin antioxidants also have blood-thinning properties. Use of bromelain supplements served as a natural way to reduce blood viscosity (caused by excessive fibrin), as did use of small oral amounts of heparin, an anticoagulant drug. Heparin, Kunin explained, has anticoagulant effects when taken orally (not just by injection) but does not interfere with vitamin K metabolism the way Coumadin does.

Because Susan had large numbers of “activated” blood platelet cells, Kunin also recommended that she take supplements of the herb Ginkgo biloba, which inhibits platelet activity. Among the other supplements were B vitamins, vitamin C, vitamin E, alpha-lipoic acid, and the amino acid arginine.

Susan’s health has improved considerably. Her blood pressure has been reduced, and she no longer has arrhythmias or muscle aches.
are all associated with increased levels of CRP. This is significant because each of these conditions increases the risk of coronary artery disease.

Dental disease. People with periodontal disease also have elevated CRP levels. This elevation may be the result of chronic infection or inflammation of the gums. It may also reflect inadequate levels of antioxidants, which would promote healing.

Smoking. Tobacco smoke raises CRP levels, and some researchers have found that they remain elevated in ex-smokers.

Overweight and obesity. Being overweight increases CRP levels. The reason is that adipose cells, particularly those that form around the abdomen (belly), produce large amounts of IL-6 and CRP. The implications are significant: being fat is partly an inflammatory disorder, and body fat promotes inflammation. This may be part of the reason why being overweight increases the risk of diabetes, heart disease, and other disorders. CRP levels are generally elevated in overweight children as well as adults.

Alzheimer’s disease. High CRP levels also have been identified in patients with Alzheimer’s disease, which researchers increasingly view as an inflammatory brain disorder.

Cancer. Many cancer patients have elevated CRP levels, which reflect an undercurrent of inflammation. This systemic inflammation may contribute to the breakdown of tissues and increase the risk of the cancer spreading.

Arthritis. People with “traditional” inflammatory diseases, such as arthritis and asthma, commonly have elevated levels of CRP or other markers of abnormally high inflammation.

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**Vitamin E and Rheumatoid Arthritis**

Consistent with the anti-inflammatory properties of vitamin E are clinical studies showing that it can reduce inflammation and pain in patients with rheumatoid arthritis. The first study, published in *Annals of the Rheumatic Diseases* in 1997, described how a team of British and German researchers treated forty-two patients with either about 1,800 IU (900 IU twice daily) of vitamin E or placebos daily for twelve weeks. The subjects kept a daily diary describing their early-morning stiffness, evening pain, and pain after routine daily activities.

On average, arthritis pain decreased by about half among patients taking vitamin E supplements. Furthermore, more patients taking vitamin E
tenance organization (HMO), insurer, or even the other doctors in his office.

One approach might be to say something like: “Doctor, using vitamins and fatty acids to treat 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 loan you this book, which contains medical references at the back. Please do me a favor and take the time to look into this and work with me.”

If that fails, you might have to change physicians to find one who is nutritionally oriented. This is easier than it used to be, and the names of several organizations making referrals to nutritionally oriented physicians are listed in appendix B. 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 by cash, check, or credit card. This may be more expensive, but it will likely lead to a nutritional program, a doctor who takes a little more time with you, and better care.

Vitamin E and Nasal Allergies

Two studies have pointed to benefits from vitamin E in nasal and respiratory allergies. Andrew Fogarty, M.D., of the University of Nottingham, England, analyzed dietary data and blood levels of immunoglobulin E (IgE) from about twenty-five hundred people. IgE is an antibody produced in excessive amounts by people with asthma, rhinitis, and hay fever. Fogarty reported in *Lancet* that higher vitamin E intake was associated with lower levels of IgE. Each 1-mg increase in vitamin E intake, up to 7 mg (about 11 IU), was related to a 5.2 percent reduction in IgE levels.

This finding is consistent with animal research showing that vitamin E can lower IgE levels and, consequently, may lessen the symptoms of some allergies. One of those studies, using laboratory mice, found that supplemental vitamin E lowered blood levels of IgE as well as cytokines.

Based on all of these studies, you might think that vitamin E can suppress immunity and increase the risk of infections. However, the opposite appears to be true, suggesting that vitamin E plays a role in regulating normal immune responses. Simin Nikbin Meydani, D.V.M., Ph.D., of Tufts University, gave seventy-eight healthy seniors various amounts of vita-
teins that form a large part of our physical structure. While many nutrients are needed for health, these three nutrients stand out for their roles in reversing osteoarthritis and other inflammatory diseases. In the next chapter you will learn about a variety of other nutrients that also have anti-inflammatory properties.
Laboratory tests indicated that Cynthia had contracted hepatitis C, and her physician noted that the virus also had damaged her pancreas, resulting in elevated blood sugar levels and diabetes. Her prognosis was poor, but a specialist suggested that she have an injection of interferon and an antiviral drug, which would result in flulike symptoms for about six months. In addition, Cynthia was told that she would eventually need a liver transplant.

Seeking an alternative to interferon therapy and a liver transplant, Cynthia consulted with Burton M. Berkson, M.D., Ph.D., of Las Cruces, New Mexico. At the time she was fatigued and her liver was enlarged and tender. Tests indicated that her liver enzymes were very high and her fasting blood sugar level was 300 mg/dl. (Normal is 75 to 85 mg/dl.)

Berkson started Cynthia on his “triple antioxidant” approach, which included 600 mg of alpha-lipoic acid, 400 mcg of selenium, and 900 mg of silymarin daily. He also asked her to follow a diet similar to the Anti-Inflammation Syndrome Diet Plan, rich in protein and vegetables and low in refined carbohydrates. After two weeks she had an increase in energy and was able to resume many normal activities. By the sixth week of supplementation Cynthia’s liver enzymes had fallen to near-normal levels and her fasting glucose was 112 mg/dl. She has been following the diet and supplement regimen for more than five years and reports that she still feels great.

**Beta-Carotene**

In addition to flavonoids, fruits and vegetables contain large quantities of carotenoids, a family of fat-soluble antioxidants. Several studies suggest that these nutrients—chiefly beta-carotene, lutein, and lycopene—are associated with relatively low levels of C-reactive protein (CRP). This association does not necessarily mean that carotenoids lower CRP levels, though this effect would be consistent with other research on antioxidants. Carotenoid levels might simply reflect fruit and vegetable consumption and the combined anti-inflammatory action of carotenoids, flavonoids, and vitamins.

In one study of several thousand people, researchers found that high levels of all the major dietary carotenoids were associated with low levels of inflammatory markers, including CRP. Another group of researchers found that both CRP and high white blood cell counts, another marker or inflammation, were associated with low beta-carotene levels. All of the
share a common inflammatory pattern resulting from a pro-inflammatory diet and inadequate intake of vitamins E and C. As another example, people with asthma frequently suffer from depression. The depression does not result from the unfortunate diagnosis of asthma but, instead, may be symptomatic of the same fatty acid imbalance affecting body and mind.

You might wonder why, if most people are eating essentially the same pro-inflammatory diet, one person develops a particular set of symptoms, such as rheumatoid arthritis, whereas another suffers asthmatic attacks, and yet another person has heart disease. The diseases to which you are susceptible reflect your individual biological weaknesses, which are the result of your genetics, overall lifestyle, stresses, age, and diet. To understand this, it helps to see your genes and biochemistry as a series of chainlike links. Everyone has their own set of weak links (as well as strong links), and the number of weak links increases with age, poor diet, stress, and other insults. Your major weak links may be your heart, your joints, or your stomach or some other tissue. Good nutrition reinforces these links and may be more important to health than genetics; this has been borne out by recent research. As you read early in this book, genes themselves depend on adequate levels of nutrients for optimal functioning.

In general, the following sections place more emphasis on conditions affecting larger numbers of people and less emphasis on those affecting fewer people. It would be impossible to cover the full spectrum of inflammatory diseases in this type of book. Still, the Anti-Inflammation Syndrome Diet Plan should have a positive impact on virtually all inflammatory diseases. So if you suffer from a disorder that is not described here, it would be worthwhile trying the diet plan and some of the supplements.

### Age-Related Wear and Tear

**What Is Age-Related Wear and Tear?**

Throughout life, old or damaged cells are broken down and replaced. However, after about age twenty-seven, the rate of cell damage begins to outpace the body’s natural repair processes. With poor nutrition, this shift toward greater cellular breakdown may begin at an earlier age. Old cells are not as efficient as new ones, and the accumulation of old cells is what is recognized as aging.
The Inflammation Syndrome Connection

The first phase of allergic rhinitis involves sneezing and a runny nose after exposure to an allergen. This is followed by an increase in eosinophils, immune cells that promote inflammation, and, importantly, set the stage for a hair-trigger immune response after further exposures to the allergen.

Researchers believe that a shift in the ratio between two types of immune cells, Th1 and Th2 cells, which increases production of IgE and certain cytokines, predisposes people to allergies. But what causes the shift? The evidence is growing that a diet high in pro-inflammatory omega-6 fatty acids is largely to blame. Finnish researchers compared twenty allergic and twenty nonallergic mothers and found that both groups of women consumed the same amounts of omega-6 and anti-inflammatory omega-3 fatty acids in their diets. However, breast milk from the allergic mothers contained less of the omega-3 fatty acids, which would predispose their infants to allergies.

Long-term, inhalant allergies maintain a steady inflammatory state in the body, generating free radicals that fuel inflammation. People with inhalant allergies often have food allergies as well. Allergies are a serious stress on the body, causing unnecessary wear and tear.

Standard Treatment

Avoidance of allergens is the best way not to have allergic reactions, but it is easier accomplished when the allergen is cat dander rather than pollen. Over-the-counter antihistamine products block allergy symptoms, but at a cost: drowsiness and an increased risk of cancer. Some prescription antihistamines (Claritin, Allegra, and Zyrtec) are safer than over-the-counter varieties. Immunotherapy—allergy shots—also can blunt symptoms, as can corticosteroid drugs.

Perhaps the best and safest over-the-counter allergy medication is cromolyn sodium, sold under the brand name NasalCrom. Cromolyn sodium is actually a synthetic flavonoid. It works by desensitizing cells in the nasal cavity that would otherwise react to an allergen and appears to have no systemic side effects, an effect that has similarities to the natural flavonoids in vegetables and fruit. NasalCrom is a nasal spray, and it is most effective when used several times a day, starting two weeks before pollen exposure. It also may help in dealing with allergies to cats and dogs. Other advantages to NasalCrom are that it is nonsedating and its activity appears limited to nasal tissues.
even temporarily disappear. Long-term, it can be disfiguring and turn fingers into stiff, twisted digits. About 20 percent of people with rheumatoid arthritis develop lumpy nodules under the skin. In some cases it becomes completely disabling.

**Causes**

It is possible that some cases of rheumatoid arthritis are triggered by an immune response to a viral infection. Whatever the triggering event, the severity of the disease reflects a highly disturbed immune system that cannot distinguish friendly cells from foes. To many observers it looks as though immune cells are chasing after biochemical ghosts.

Considerable research has shown that people with rheumatoid arthritis are commonly deficient in multiple nutrients. These deficiencies can impair immune function, and the benefits of nutritional supplementation have been confirmed by numerous studies. Several cases of scurvy (extreme vitamin C deficiency) have been reported with rheumatism as the most obvious symptom. Low levels of vitamin C lead to a weakening of blood vessel walls, allowing red blood cells to leak into surrounding tissue, where they trigger an immune response. Vitamin C supplementation resolved the symptoms in these patients.

**How Common Is Rheumatoid Arthritis?**

An estimated 2.5 million Americans (about 1 percent of the U.S. population) have rheumatoid arthritis. It affects twice as many women as men.

**The Inflammation Syndrome Connection**

Levels of several pro-inflammatory cytokines—interleukin-1, interleukin-6, and tumor necrosis factor alpha—are typically elevated in people with rheumatoid arthritis. These cytokines instruct immune cells to unleash a powerful attack. The tenderness, pain, and swelling are by-products of chronic, intense inflammation.

**Standard Treatment**

Most medications—more than 250 different kinds—are designed to relieve pain. But none of them treat the underlying disease process.

**Nutrients That Can Help**

Many people benefit from the anti-inflammatory effect of omega-3 fish oils. However, it may take several months to see an improvement. A Scot-
Standard Treatment

NSAIDs are commonly used to reduce inflammation and pain, but they can lead to excessive bleeding and ulcers. Some injuries must be treated surgically.

Nutrients That Can Help

Søren Mavrogenis, a physiotherapist in Copenhagen and the physical therapist for the Danish Olympic team, uses a combination of fatty acids and antioxidants to treat injuries among Olympians and other elite athletes. The fatty acids include omega-3 fish oils (706 mg daily), gamma-linolenic acid (670 mg daily), and modest amounts of antioxidant vitamins and minerals.

In one of several controlled studies, Søren and Norwegian physicians treated forty recreational athletes, men and women eighteen to sixty years old, with the fatty acid/antioxidant supplement or placebos for one month. All of the subjects had suffered overuse injuries in sports activities, experiencing chronic inflammation for at least three months before entering the study. In addition to the supplements and placebos, the subjects also received physical therapy. Nearly all of the participants had significant reductions in their inflammation and pain.

Exercise is well documented for increasing levels of free radicals, which can damage DNA. This DNA damage may account for the weathered looks of many serious athletes. Clinical trials have found that vitamin E supplements can reduce or prevent such DNA damage. Vitamin C quenches free radicals as well, and also is crucial for forming new collagen and cartilage during the healing process.

What Else Might Help?

Pycnogenol, a complex of natural antioxidants obtained from the bark of French maritime pine trees, has impressive anti-inflammatory properties. It also increases the body’s synthesis of collagen and elastin, another tissue protein. Anthony Martin, D.C., of Montréal, has advised many professional Canadian athletes who have been injured. In one case, a hockey player who had injured his knee was told by his team’s physician that he would probably need surgery and be on the sidelines for eight weeks. Martin recommended that the player take 400 mg daily of Pycnogenol. His knee stopped swelling, and after a week he no longer needed crutches.
colinate for several months. Diachrome, a proprietary combination of chromium picolinate and biotin, a B vitamin, have been shown to further enhance glucose control.

Vitamins E and C improve glucose tolerance and have the added benefit of lowering levels of CRP and interleukin-6. The effect of these vitamins on easing diabetic complications may be greater than their glucose-lowering properties.

Silymarin can have significant glucose-lowering effects in people with diabetes. An Italian study found major improvements in blood sugar levels and many other symptoms of diabetes after patients took silymarin supplements for one year.

By their nature, antioxidants have anti-inflammatory properties. Some antioxidants also influence the production of cytokines, so they reduce inflammation via another means. Based on insulin’s fundamental role in biology, it is likely that the hormone controls the activity of some pro-inflammatory cytokines. It is worthwhile targeting a fasting glucose of between 75 and 85 mg/dl and a fasting insulin under 7 mcIU/ml.

What Else Might Help?

A person with diabetes must recognize that he or she has a potentially terminal disease, but one that usually can be modified and even reversed through diet. A relatively low glycemic diet, such as the Anti-Inflammation Syndrome Diet Plan, can moderate the spikes in glucose and insulin that result from refined carbohydrates and sugars. Protein will stabilize glucose and insulin levels, and the fiber in vegetables will have a similar effect because it blunts the absorption of carbohydrates.

It would be worthwhile as well for people with adult-onset diabetes to undergo testing for allergylike food sensitivities. For example, in one case, a person had no significant rise in glucose after eating ice cream, but had a several hundred point increase in glucose after having Scotch whiskey. A rise or decline of more than 50 points (mg/dl) in one hour is a sign of serious glucose-tolerance problems.

Gastritis, Ulcers, and Stomach Cancer

What Are Gastritis, Ulcers, and Stomach Cancer?

Gastritis refers to an inflammation of the stomach wall, as well as of the uppermost part of the small intestine, the duodenum. An ulcer, such as a...
peptic ulcer, is a lesion on the wall of the stomach. The most serious ulcers form deep craters or bleed. Gastric cancer is a growth of abnormal cells on the stomach wall. Sometimes, but not always, gastritis will evolve into an ulcer and both conditions increase the risk of gastric cancer.

**Causes**

For many years physicians believed that gastritis was the result of excess stomach acid, and drug treatments were designed to reduce the secretion of gastric juices or to make them more alkaline. In 1983 researchers identified a type of bacterium, *Helicobacter pylori*, in the stomach, and in the 1990s it was recognized as the leading cause of gastritis, ulcers, and stomach cancer. Conventional treatment now focuses on antibiotics and drugs that reduce the secretion of gastric juices.

However, there is a wrinkle to this story. With the successful use of antibiotics in eradicating *H. pylori* infections, a new leading cause of gastritis and ulcers has emerged: nonsteroidal anti-inflammatory drugs (NSAIDs) such as aspirin, ibuprofen, and coxibs. All NSAIDs, including the so-called Cox-2 selective drugs, disrupt the activity of cyclooxygenase-1 (Cox-1), an enzyme critical for fatty acid production and for maintaining the health of the stomach wall.

**How Common Are Gastritis, Ulcers, and Stomach Cancer?**

Gastritis affects roughly 3 million Americans, and an estimated 5 million people have gastric ulcers. Although stomach cancer does not garner many headlines, it is the second most common fatal cancer in the world, and in most countries the five-year survival rates are less than 20 percent. Chronic *H. pylori* infections boost the risk of stomach cancer by up to 80 percent.

**The Inflammation Syndrome Connection**

*H. pylori* irritates the stomach wall, but the immune response to this infection may wreak most of the damage. White blood cells are mobilized to the site of the infection, where they release free radicals and pro-inflammatory eicosanoids such as prostaglandin E₂. *H. pylori* is often highly resistant to this immune response, which can inflame the stomach wall and may eventually lead to an ulcer. Free radicals damage the DNA in stomach wall cells, increasing the chance of mutations, some of which could seed cancers.
Hepatitis

What Is Hepatitis?

Hepatitis literally means liver inflammation. It is usually, though not always, caused by a viral infection. Symptoms of acute hepatitis, which generally lasts fewer than six months, tend to appear suddenly and include fever, nausea, vomiting, and a general feeling of being ill. Many cases of acute hepatitis evolve into chronic low-grade liver infections.

Sometimes people with chronic hepatitis may be asymptomatic, and at other times they may experience extreme fatigue and loss of appetite. In both acute and chronic hepatitis liver enzymes become elevated—one sign of liver disease. Noninfectious hepatitis may result from drug or alcohol abuse. Often, the stress of hepatitis reduces levels of glutathione, one of the body’s principal antioxidants, which is made in the liver. The viral and inflammatory stresses, combined with low glutathione levels, compromise liver function and may lead to cirrhosis or liver failure.

Causes

Viral hepatitis is caused by one of several viruses that attack this organ. The different types of hepatitis are referred to by a letter, as in hepatitis A or hepatitis B. Transmission of the different viruses occurs in a variety of ways. For example, hepatitis A is usually transmitted through fecal contamination of food, whereas hepatitis B is typically transmitted through sexual contact or shared needles. Hepatitis C is passed through blood, such as through shared needles or through pre-1991 blood transfusions. There are still other forms of hepatitis. One laboratory indication of hepatitis infection is an elevation in liver enzyme levels.

How Common Is Hepatitis?

Hepatitis C has received the lion’s share of attention in recent years, and an estimated 4 million Americans have chronic hepatitis C infections. Many people have the disease without symptoms, and it may take decades of chronic hepatitis for it to become clinically apparent. Approximately ten thousand Americans die each year as a result of hepatitis C infections.

The Inflammation Syndrome Connection

Inflammation is the body’s normal response to infection. But in chronic infection, the sustained immune activity may cause as much damage as, if
of overweight followed public health recommendations in the 1980s to eat low-fat diets. Low-fat diets usually translate into high-calorie, high-carbohydrate diets that, again, scrimp on protein, vitamins, and minerals.

Being overweight is the number one risk factor for developing adult-onset diabetes, and overweight children and teenagers now account for half of all new diagnoses of diabetes. The prevalence of type 2 diabetes among children has increased by an estimated fifteen to twenty-five times since 1980. Being overweight also increases the risk of hypertension, heart disease, gallstones, colon cancer, and (in men) stroke.

The Inflammation Syndrome Connection
The high-sugar and high-carbohydrate diets that lead to obesity raise glucose levels, and elevated glucose spontaneously generates large numbers of free radicals. These free radicals stimulate the inflammatory response, which can increase the risk of coronary artery disease, cancer, Alzheimer’s, and many other diseases. In addition, abdominal fat cells secrete large quantities of pro-inflammatory interleukin-6 and C-reactive protein. In overweight and obese people, these substances help maintain a state of chronic inflammation.

Increases in body fat are often associated with disturbed hormone levels—elevated cortisol and insulin and decreased thyroid hormones. Sometimes figuring out which came first is like the chicken-or-the-egg story. However, being overweight leads to hormonal shifts that make it easy to gain still more weight. Because of their cell-regulating actions, it is very likely that weight-promoting hormones increase the activity of pro-inflammatory cytokines.

Standard Treatment
Conventional wisdom holds that people should eat fewer calories and exercise more to lose weight. Exercise helps because it creates more muscle cells, which burn calories for energy. But compelling research indicates that calories from protein and good fats are far better than those from carbohydrate-rich foods such as pasta, bread, and pizza. It makes no sense to build a diet around empty calories. Instead, follow a nutrient-dense diet such as the plan described in this book.

Nutrients That Can Help
The many fat-burning, fat-blocking, or carbohydrate-blocking supplements sold may help a small number of people, but they skirt the bottom-
APPENDIX B

Sources of Anti-Inflammatory Products

Nutritional Supplements

Many companies market a variety of anti-inflammatory supplements. Although these companies are not allowed to make a therapeutic claim for nutritional supplements, many of their product names are often very suggestive, and clerks in health food stores and pharmacies can often provide guidance.

Some products are formulated as general anti-inflammatory supplements with many ingredients, whereas others are stand-alone products such as omega-3 fish oil, gamma-linolenic acid (GLA), glucosamine, and vitamin E supplements. The following companies produce and market high-quality products.

ABKIT, Inc.

Abkit manufactures the CamoCare line of skin-care products with chamomile and AlphaBetic, a once-a-day supplement for people with diabetes. Many of these products are available at health food stores, natural foods groceries, and pharmacies. For more information call 800-226-6227 or go to www.abkit.com.
Why Grassfed Is Best!: The Surprising Benefits of Grassfed Meat, Eggs, and Dairy Products by Jo Robinson (Vashon, WA: Vashon Island Press, 2000; $7.50). This small book (128 pages) is worth every penny. It makes a powerful case for eating grassfed meats and other foods, most of which are compatible with the Anti-Inflammation Syndrome Diet Plan. Included is a list of sources for meat from free-range and pasture-fed animals. Order it from Vashon Island Press, 29428 129th Avenue SW, Vashon, WA 98070. For more information call 206-463-4156. You also can order it from www.thestoreforhealthyliving.com. Add $4.50 for shipping and handling.

Going Against the Grain: How Reducing and Avoiding Grains Can Revitalize Your Health by Melissa Diane Smith (Chicago: Contemporary Books, 2002; $14.95). This book explores how the cultivation and consumption of grains led to a deterioration in people’s health. Smith provides dietary plans for having low-grain and zero-grain diets.

Know Your Fats: The Complete Primer for Understanding the Nutrition of Fats, Oils, and Cholesterol by Mary G. Enig, Ph.D. (Silver Spring, MD: Bethesda Press, 2000; $29.95). Though technical, Know Your Fats may be the most comprehensive consumer book on making sense of the many dietary fats. For more information e-mail customer@bethesda press.com or go to bethesdapress.com.

Web Sites

The Official Anti-Inflammation Syndrome Diet Plan Web Site
www.stopinflammation.com

The Nutrition Reporter
Dozens of articles on vitamins and minerals.
www.nutritionreporter.com

Consumerlab.com
Independent reports evaluating whether specific nutritional supplements contain what their labels say. Although Consumerlab.com performs fair and independent evaluations, it tests only a small percentage of the nutritional supplements on the market, and it identifies only those that pass (not those that fail) testing.
www.consumerlab.com


5. What’s Wrong with Anti-Inflammatory Drugs


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