NOVEL WAY TO SUPPRESS EMOTIONAL EATING

Omeka-3 Fatty Acids Increase Brain Volume

Protect Your DNA Against CT Scan Radiation

Hidden Link Between Obesity and Diabetes

Drugs That Deplete Vital Nutrients

PLUS—
Vitamin K Lowers Diabetes Risk
Resveratrol Boosts Blood Flow to Brain
Green Tea Suppresses Lung Cancer
Humans get most of their vitamin K from green vegetables in the form of vitamin K1. The problem is that K1 is tightly bound to plant fiber and only a small fraction absorbs into the bloodstream.

Vitamin K2 is absorbed much more efficiently than K1. Scientific studies show K2 provides overwhelmingly superior benefits for the bones, arteries and other tissues.1-8

The predominant sources of K2 in Western diets are organ meats, dairy and egg yolks — foods that health conscious people seek to minimize in their diets. The result is that most people in Western societies are not obtaining optimal potencies of vitamin K.

The solution is to use a vitamin K supplement that provides ideal potencies of K1 and the two active forms of K2.

Ideal Forms of Vitamin K2

Over the past four years, two forms of vitamin K2 have been extensively researched and the findings reveal vastly improved effects compared to K1.

The MK-4 form of vitamin K2 is the most rapidly absorbed and is now routinely used in Japan to maintain healthy bone density. MK-4, however, only remains active in the blood for a few hours.

The MK-7 form of K2, on the other hand, remains bio-available to the human body over a sustained 24-hour period and to higher levels (7- to 8-fold) during prolonged intake.9

Both MK-4 and MK-7 have demonstrated remarkable health benefits when studied in human populations.

The Most Complete Vitamin K Formula

Vitamin K1 is the form found in plants and vegetables and should be part of most people’s daily supplement regimen. Even more important is inclusion of the MK-4 and MK-7 forms of vitamin K2.

Based on new data substantiating the long-acting effects of MK-7, it is now possible to ingest fewer total micrograms of vitamin K but achieve far higher sustained blood levels of this critical nutrient.

Super K formula provides in just one daily softgel:

Vitamin K1 1000 mcg
Vitamin K2 (MK-4) 1000 mcg
Vitamin K2 (MK-7) 100 mcg

The virtue of this formula is that it provides the precise amount of the long-acting MK-7 form of vitamin K2 that recent human studies have shown provides optimal K2 levels over a 24-hour period. The MK-4 is included to provide the rapid increase in vitamin K blood levels that may account for its beneficial effects in certain studies.

More Expensive Forms of K2 … Same Low Price

Super K with Advanced K2 Complex provides all three forms of vitamin K. The retail price for a bottle containing 90 softgels (three-month supply) is $26. If a member buys four bottles, the price is reduced to just $17.25 per bottle.

The same Super K formula containing the identical potencies of Vitamin K1, K2 (MK-4) and K2 (MK-7) can be found in the Life Extension® Super Booster. If you take the Super Booster, you do not need additional Super K softgels.

Warning to Coumadin® (warfarin) Drug Users

Patients prescribed vitamin K-antagonist anti-coagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental vitamin K. Ask your doctor if you can take a low dose (45 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for the vitamin K you supplement with. Life Extension provides several forms of low-dose vitamin K for physician consideration.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
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Do you routinely eat more than you mean to? Your problem may be more than a matter of self-control. A historic study reveals the brain chemistry behind compulsive eating and drug addiction is identical. The good news is a newly identified saffron extract targets these neurochemical factors, helping to curb appetite and reduce caloric intake.

38 COMBATING THE “DIABESITY” EPIDEMIC
Obesity-driven diabetes—now termed “diabesity” by some experts—is expected to affect 366 million people worldwide by 2030, making it the largest epidemic the world has ever faced. Yet conventional medicine largely fails its victims through late detection and inadequate treatment. Life Extension® examines the overlooked factors behind this global health disaster and offers multimodal prevention strategies.

66 PROTECT YOURSELF FROM DEADLY DIAGNOSTIC RADIATION
Recent headlines on the appalling misuse of CT scans and X-ray imaging have finally drawn attention to their lethal effects. Routine diagnostic radiation exposure may account for nearly 30,000 new cancer cases each year. Here we detail an optimal radioprotective nutritional regimen, including polyphenols, trace minerals, and antioxidant compounds.

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The credit card-sized 911 Medical ID Card™ or ultra-slim 911 Medical ID Medallion™ enables you to store and update your complete medical history and may literally be the difference between life and death.
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Does Your Pharmacy Care if You Live or Die?

Today’s chain pharmacies have become drug-dispensing assembly lines. They fill whatever your doctor prescribes or insurance covers, regardless of what is best for your individual needs.

At Life Extension Pharmacy™ we do things differently. We take advantage of our partnership with the Life Extension Foundation® for intimate knowledge of the peer-reviewed scientific literature about the prescription drugs you take … including drug interactions, side effects, lower-cost alternatives, and, in some cases, safer and more effective ways to use your medications. It’s our mission to preserve your health and save you money.

Our Independent Thinking

As well as offering advice on the safety and effectiveness of your prescriptions, our team of pharmacists also explains how they can work synergistically with nutrient and hormone supplements to keep you healthy.

Consider the anti-coagulant drug Coumadin® (warfarin) as an example. While most doctors advise patients who are taking Coumadin® to avoid vitamin K supplements and vitamin K-containing foods, recent research demonstrates that Coumadin® plus low-dose vitamin K supplements (around 45 mcg a day) can achieve more stable measurement of blood clotting time (the INR test). Even more important is that Coumadin’s horrendous side effects (accelerated atherosclerosis and bone loss) may be preventable in the presence of stable vitamin K levels in the body.

Another problem occurs with drugs prescribed to treat prostate cancer (such as Lupron®) that deplete the body of testosterone. Through our collaboration with the Life Extension Foundation, we can advise patients on the specific steps they should take to protect against the lethal "Androgen Deprivation Syndrome."

Another example is the statin drug Crestor®. This high-priced medication is flying out of pharmacies across the country. But should it be? Recent studies reveal that it’s not right for everyone who is taking it. Visit www.LifeExtensionRx.com/crestor for our in-depth analysis on the latest Crestor® study.

Tailored Services

So keep this in mind… the Life Extension Pharmacy™ puts your welfare first. If a lower-cost drug may work better for you than an expensive brand name, we’re going to recommend it. Combining the Life Extension Foundation’s nutraceutical expertise with our pharmacists’ in-depth knowledge of pharmaceuticals and customized prescription compounding, Life Extension Pharmacy™ is committed to helping you get the very best results from your therapy.

Saving Your Money & Your Health

Life Extension Pharmacy™ offers a range of ways to save you money including low-cost compounded drugs, life-saving prescription drugs at greatly discounted prices, and practical suggestions on how to conserve your health care dollars. To see how much we can save you, look at our prices for the statin simvastatin and the antidiabetic drug glyburide compared with CVS in the table above!

Super Low Prices on Compounded Prescription Drugs

Call 1-877-877-9700 today to fill a new prescription or to transfer an existing one.
Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physical therapist in Caracas to specialize in anti-aging medicine.

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Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Renton, WA, and a board member of the Vitamin C Foundation and the American Preventive Medical Association, among many other groups.
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Ralph W. Moss, PhD, is the author of books such as Antioxidants Against Cancer, Cancer Therapy, Questioning Chemotherapy, and The Cancer Industry, as well as the award-winning PBS documentary, “The Cancer War”. Dr. Moss has independently evaluated the claims of various cancer treatments, and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

Michael D. Ozner, MD, FACC, FAHA is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida, and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of The Great American Heart Hoax and The Miami Mediterranean Diet (2008, Benbella Books). For more information visit www.drozner.com.

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Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Renton, WA. He received his MD from the University of Michigan and has taught nutritional and biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 11 books and publishes Nutrition and Healing, a monthly newsletter with a worldwide circulation of more than 100,000.

SCIENTIFIC ADVISORY BOARD
Life Extension® was the first to introduce coenzyme Q10 to the United States way back in 1983. Since then, we have consistently introduced more potent and better absorbable forms of this critical nutrient.

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ contains an organic compound called PrimaVie® shilajit that research shows doubles levels of CoQ10 in the mitochondria.1

Shilajit has been shown to help restore and sustain cellular energy. The latest studies reveal that when shilajit is combined with CoQ10, cellular energy gains substantially increase.

In a breakthrough preliminary study, the combination of CoQ10 and shilajit produced a 56% increase in cellular energy production in the brain—40% better than CoQ10 alone. In muscle there was a 144% increase, or 27% better than CoQ10 alone.2

Researchers have found that shilajit works to boost CoQ10’s beneficial effects by:

1. Stabilizing CoQ10 in its superior ubiquinol form, thereby prolonging its action at the cellular level.3,4

2. Facilitating more efficient delivery of CoQ10 into the mitochondria, resulting in greater cellular energy output.5-9

Scientific analysis shows that shilajit itself is rich in essential compounds that promote mitochondrial metabolism. Part of shilajit’s beneficial effects derives from its ability to help the mitochondria convert fats and sugars into adenosine triphosphate, or ATP—the body’s main source of energy.5-9

Combining ubiquinol CoQ10 with shilajit generates a powerful synergy that supports more youthful cellular energy production than CoQ10 alone.2,4,5

The retail price for 60 100-mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $62. If a member buys four bottles, the price is reduced to $42 per bottle. Item #01426

The retail price for 100 50-mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $58. If a member buys four bottles, the price is reduced to $39.75 per bottle. Item #01425

To order Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ call 1-800-544-4440 or visit www.LifeExtension.com

References:

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Lethal Danger of CT Scans

BY WILLIAM FALOON

We tried everything… from pleading with arrogant physicians to providing irrefutable documentation to support our position. The response was always the same: we were “out of our minds” for suggesting that medical X-rays increase future cancer risks.

Our opposition could never substantiate that exposing healthy cells to ionizing radiation was safe. They did at one point rely on the Atomic Energy Commission, who claimed there were no dangers to low-level radiation exposure.

The Atomic Energy Commission was created to “manage the development, use, and control of atomic (nuclear) energy for military and civilian applications.” Like so many federal agencies, the priority was not to protect the public’s health. Instead this tax-funded bureaucracy (like the FDA) functioned to guarantee the economic success of the industries it regulated.¹

By ridiculing those who warned about the carcinogenic effects of X-rays, the federal government and medical establishment enabled companies making CT scanners (and other radiation devices) to earn tens of billions of dollars in profit, with Medicare and private health insurance picking up most of the costs.

¹ See “As We See It.”
Radiation Overload

Compared to regular medical X-rays, CT scans yield much higher-resolution images. Unfortunately, CT scans also expose the patient to hundreds and sometimes thousands of times more radiation.\(^2\)\(^4\)

The routine use of CT scans and other dangerous X-ray imaging procedures has skyrocketed over the past three decades. In 1980, there were 3 million CT scans done. By the year 2007, the number increased to about 70 million.\(^5\)\(^6\)

We at Life Extension\(^*\) long ago warned members to avoid CT scans and any kind of X-ray unless absolutely necessary. Up against us was an armada of for-profit companies who promoted CT scans to healthy people to measure coronary artery calcification, virtual colonoscopy in place of the more effective standard colonoscopy (flexible tube procedures), and even whole-body CT scans to identify abnormalities anywhere in one’s anatomy.

The irony is that health-conscious people, who often paid for whole-body CT scans out of their own pockets, unwittingly exposed their whole body to huge levels of DNA gene-mutating radiation!

Absolutely Shocking Data

The uninformed public is in for a shocker.

A study released at the end of last year reveals that CT scans deliver up to four times more radiation than what was previously believed, which was already dangerously high.\(^7\)

At the same time, another study led by the National Cancer Institute showed that CT scans administered in the year 2007 alone may contribute to 29,000 new cancer cases and nearly 15,000 cancer deaths.\(^8\)

Unsafe at Any Dose

Doctors argue that the amount of radiation emitted from regular medical X-rays is so low that there is no cancer risk. This flies in the face of data showing that any amount of radiation inflicts free radical damage to DNA that adversely affects our genes.\(^9\)\(^10\)

We long ago reported statistics indicating that a significant percentage of today’s cancers are caused by medical radiation.\(^8\)\(^11\)\(^13\) Radiation-induced cancers occur in response to mutations in genes that regulate cellular proliferation.

While doctors state that radiation is safe as long as it is kept at a certain level, we argued that even the smallest particle of radiation inflicts DNA damage. For radiation to be safe, all of the DNA damage must be repaired perfectly. Any damage not perfectly repaired creates mutations, any one of which has the potential to lead to further mutations that cause cancer.

In fact, we long ago pointed to research showing that the lowest possible dose of radiation is not only unsafe, but also does far more damage than previously thought and is indeed mutagenic.\(^14\)
In June 2005, the National Academy of Sciences released a report stating that even very low doses of radiation can cause cancer. In its report, the National Academy defined low dose as being as low as “near zero.”

While the researchers indicated that the cancer risk from any given X-ray is very small, their report stated: “Risk would continue at a linear fashion at lower doses without a threshold and that the smallest dose has the potential to cause a small increase in risk to humans.”

As you can see by the chart on this page, the amount of radiation emitted from a typical medical X-ray is quite low. Typical X-rays, however, are becoming a relic of the past. CT (computerized tomography) scans provide a much better picture of your insides, but use much more radiation. A CT scan of your abdomen, for example, exposes you to an amount of radiation equivalent to that of 500 or more chest X-rays.

The more worrisome diagnostic procedure is the whole-body scan, which experts have estimated is the equivalent of 900 chest X-rays. According to the National Academy of Sciences report, a 45-year-old who planned to undergo 30 annual whole-body scans would potentially increase his or her cancer risk many times.

The National Academy of Sciences stated that there is no radiation threshold below which exposure can be viewed as harmless. This finding means that everyone who has had a medical X-ray is at some increased risk for developing leukemia or a solid cancer. Considering how many X-rays people are exposed to in a lifetime, the risk of developing cancer from the cumulative effects of so many X-rays and CT scans is a serious concern.

<table>
<thead>
<tr>
<th>Diagnostic Procedure</th>
<th>Typical Effective Dose (mSv)¹</th>
<th>Number of Chest X-rays (PA film) for Equivalent Effective Dose²</th>
<th>Time Period for Equivalent Effective Dose from Natural Background Radiation³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest X-ray (PA film)</td>
<td>0.02</td>
<td>1</td>
<td>2.4 days</td>
</tr>
<tr>
<td>Skull X-ray</td>
<td>0.07</td>
<td>4</td>
<td>8.5 days</td>
</tr>
<tr>
<td>Lumbar spine</td>
<td>1.3</td>
<td>65</td>
<td>158 days</td>
</tr>
<tr>
<td>IV urogram</td>
<td>2.5</td>
<td>125</td>
<td>304 days</td>
</tr>
<tr>
<td>Upper GI exam</td>
<td>3.0</td>
<td>150</td>
<td>1.0 year</td>
</tr>
<tr>
<td>Barium enema</td>
<td>7.0</td>
<td>350</td>
<td>2.3 years</td>
</tr>
<tr>
<td>CT scan (head)</td>
<td>2.0</td>
<td>100</td>
<td>243 days</td>
</tr>
<tr>
<td>CT scan (abdomen)</td>
<td>10.0</td>
<td>500</td>
<td>3.3 years</td>
</tr>
</tbody>
</table>

1. Effective dose in millisieverts (mSv).
2. Assumes an average “effective dose” from chest X-ray (PA film) of 0.02 mSv.
3. Assumes an annual average “effective dose” from natural background radiation of 3 mSv in the US.

request is another matter. They are more likely to state there is no danger to any dose they administer.

As risky as properly done CT scans are, reports published at the end of 2009 exposed instances of major medical centers being so sloppy in adjusting the settings on their CT scanners that patients were exposed to up to eight times the normal radiation dose.17-19

Children are more vulnerable to the long-term effects of the DNA damage inflicted by X-rays. In one particularly heinous case, a 30-month-old child was exposed to more than 60 minutes of continuous CT scans when the normal time period is only 2-3 minutes. The hospital’s radiology manager called the overdose a “rogue act of insanity” while the chief of the state’s regulatory division said it was “one of the more egregious, extreme cases that I have ever seen.”20

The reality is that for the convenience of the X-ray technicians, CT scanner settings are seldom adjusted to use the least amount of radiation to obtain a clear image.

**Tribute to the Pioneer Who Took On the Establishment**

In 2005, I had the privilege of receiving a telephone call from John Gofman, MD, PhD. For those who don’t know, he was one of the great scientific minds of the 20th century. Dr. Gofman praised our work for getting the word out about the lethal dangers of medical X-rays and encouraged us to keep up the fight.

Dr. Gofman was a physicist turned medical doctor whose early work on radioactive isotopes resulted in his recruitment to work on The Manhattan Project at Los Alamos, New Mexico to develop the first atomic bomb.

In 1947, Dr. Gofman began research that would soon lead him to conclude that cholesterol is a cause of atherosclerosis.21,22 Dr. Gofman and his colleagues were the first to show that specific fractions of cholesterol such as LDL (low-density lipoprotein) are the most dangerous. Dr. Gofman was involved in the publication of possibly the first book in 1951 about how low-fat and low-cholesterol diets prevent heart disease.23

Dr. Gofman’s expertise on the biological effects of radiation caused him to later take a very controversial position. He meticulously documented how diagnostic X-rays were a cause of cancer and vascular disease in the 1960s, long before anyone suspected this link. The Atomic Energy Commission and medical establishment fiercely contested Dr. Gofman’s allegations that medical X-rays caused any harm.

I am always amazed at individuals who are able to contribute so much to our scientific base of knowledge. In Dr. Gofman’s case, he was instrumental in harnessing nuclear energy, warning of the dangers of low-level radiation, and then moved on to a completely different field to discover specific fractions of cholesterol that cause atherosclerosis.

I was saddened to learn that Dr Gofman died of heart failure two years after my conversation with him, possibly caused by the radiation exposure he encountered while working with radioactive isotopes.

**Dr. Gofman Explained How X-rays Cause Atherosclerosis**

John W. Gofman, MD, PhD, was Professor Emeritus of Molecular and Cell Biology at the University of California, Berkeley and one
of the world’s most distinguished medical and nuclear scientists. His research showed that no amount of radiation—no matter how small—is safe.24-27

Dr. Gofman’s data analysis conflicts with other reports from the standpoint that he believed far more cancers are caused by medical radiation. Further, he came to the conclusion that exposure to radiation from medical procedures is a “highly important (probably principal) cause” of cancer and ischemic heart disease in America.13

How would radiation cause heart disease? According to Dr. Gofman, the same way it causes cancer. Radiation damages DNA—in this case, DNA in the arteries. The radiation-induced changes create a cancer-like phenomenon in the arteries known as atheroma. Dr. Gofman believed that the interaction between atheromas and lipids blocks arteries and causes blood clots.

One of radiation’s most striking effects is causing arterial cells to multiply abnormally. The abnormal growth of cells lining the arteries has the effect of narrowing the arteries.

Abnormal growth of smooth muscle tissue inside the artery creates something similar to scar tissue that occludes the arteries and ruins their flexibility. Lipid-laden cells, monocytes, macrophages, cholesterol, fibrin, and calcium are all components of plaques and collect within damaged areas in the inner arterial wall where arteries eventually clog.

As early as 1944, scientists showed that radiation could produce plaques and foam cells.28 Since then, additional studies have demonstrated that radiation can produce arterial lesions, sticky platelets, and increased free radicals.29-34 In fact, radiation can create atherosclerosis in its entirety.35 Studies show that people who have undergone radiation of areas containing major blood vessels often develop atherosclerosis in those blood vessels.36,37

Medical Radiation and Today’s Breast Cancer Epidemic

Breast cancer incidence has sharply increased since the year 1960. This correlates with an exponential increase in the use of medical X-rays.

The most recently released data indicate that as many as 2,000 excess cases of breast cancer will develop as a result of CT scans performed in the year 2007 alone.38

Dr. John Gofman, however, knew this nearly 40 years earlier. In 1970, Gofman and his colleague Arthur Tamplin wrote to The Lancet39 expressing their concern that the amount of radiation needed to double the risk of breast cancer was very low. Young women were especially vulnerable, he said, and the greater the radiation exposure, the greater the risk. The evidence was there that radiation exposure could significantly increase the risk of breast cancer, but few were following up on this critical research.

In a lecture given at a meeting held by the American Association for the Advancement of Science in 1994, Dr. Gofman presented his findings showing that there was increased breast cancer in Japanese women who survived the US atomic bombings of Hiroshima and Nagasaki.40-42 Studies on mice and guinea pigs showed that cancer-resistant animals developed breast cancer if given repeated doses of radiation.43 But the most damning research about breast
cancer and radiation was preliminary data from young women who had undergone repeated fluoroscopies as part of their tuberculosis treatment from 1930-1950. These women were developing breast cancer at more than double the expected rate.44-48

In preparing for the breast cancer talk, Gofman began looking into how many cases of breast cancer in America might be caused by radiation exposure. His first estimate was that 35% of all breast cancer cases wouldn’t exist had the women not been exposed to medical radiation. His revised estimate, published a year later, was 75%.49 Gofman paid particular attention to such exposures during years 1920-1960 because those exposures would contribute to breast cancer rates for at least the next 45 years. Gofman did not believe these exposures were the only cause of the women’s cancers, but he believed they played a major role in making them come about.

According to Gofman, the lag time between radiation exposure and cancer is variable. Data shows that the average lag time between radiation exposure from the American raids on Japan and the appearance of breast cancer in Japanese women was about 12 years.41 However, it can occur sooner or later. Radiation has greater carcinogenic effects on younger people. Data from the Japanese studies show that if a woman was 20 years old or younger when exposed to the radiation, she had a 13-fold elevated risk of breast cancer occurring by the time she was 35 (assuming 1 Sievert of radiation).50 Some studies put the risk for older women at double. Regarding children, it has been stated that 10 rads administered to a fetus is enough to produce all forms of childhood cancer, whereas the same amount in an adult would not have that effect.51-54

Critics were unable to demonstrate that Gofman’s 75% radiation-induced breast cancer figure was wrong. They could challenge it using different assumptions, but as Gofman puts it, “they were unable to show any basis for thinking that their assumptions were more likely to be right than our assumptions.” (Editor’s note: Human radiation research is based necessarily on assumptions because human experiments cannot be done.)

The Other Side of the Story

While the radiation emitted from CT scans will cause hundreds of thousands of cancer cases and an untold number of heart attacks and strokes, this does not mean that they should be banned.

You may remember the term “exploratory surgery” to describe hospital operations that used to be done to diagnose a disease. With the advent of imaging devices like CT scanners, these risky hospital procedures have become a virtual relic of the past.

If a patient suffers an acute stroke, an emergency CT scan can determine whether it is an ischemic (blocked artery) stroke or hemorrhagic (blood vessel bleed) stroke. If an ischemic stroke is quickly diagnosed and treated with a clot-busting drug like TPA (tissue plasminogen activator), brain damage can be mitigated or eliminated. A hemorrhagic stroke, on the other hand, might require immediate surgery to repair the broken blood vessel. CT scans can also help doctors ascertain areas of trauma in severe accidents.

Stroke or accident victims might not have time for magnetic resonance imaging (MRI) or magnetic resonance angiography and therefore require an immediate CT scan. While Life Extension recommends that magnetic resonance imaging or ultrasound diagnostics be used in place of X-rays whenever possible, the following
medical problems may require that a CT scan be performed as opposed to MRI:

- Patient has a cardiac pacemaker;
- Patient has an implantable cardiac defibrillator;
- Patient has a metallic foreign body near or in their eye;
- Patient has an aneurysm clip on one of the delicate blood vessels in the brain;
- Patient has metallic orthopedic hardware such as metal screws or plates to hold bone(s) together.

In general, MRI offers better contrast resolution and better assessment of soft tissue pathology like tumors, ligaments, and tendons. MRI also offers the ability to change the reference plan for imaging without needing to move the patient. CT scan, in comparison, is better than MRI at evaluation of bony lesions (e.g., bone metastasis) and bone fractures.

If a CT scan is absolutely necessary, ask that the intensity be modulated so the least amount of radiation needed to obtain an image is used.

Cancer patients can often benefit from whole body PET (positron emission tomography) scans whereby metastatic lesions can be detected by virtue of the “hot spots” that their hypermetabolic activity generates. The amount of radiation emitted in PET scans (or PET CT scans) is similar to a typical CT scan. While avoiding needless radiation is important for otherwise healthy people, cancer patients can benefit from the data gathered from PET scans by virtue of identifying the existence and location of metastatic disease before symptoms manifest.

**My Personal Experience with Needless Radiation Exposure**

Crooked doctors exposed me to an enormous amount of needless radiation at an early age. Unless the nutrients I take (like high-dose vitamin D) reverse the radiation-induced gene mutations, I will be vulnerable to a host of cancers and heart disease for the rest of my life.

As you have read, medical X-rays not only damage genes that regulate cellular proliferation (thereby increasing cancer risk), but they also damage the inner lining of the arteries (the endothelium) thereby increasing cardiovascular risk.

When I was age 27, I developed some heart palpitations. Had I known a competent cardiologist at the time, my **mitral valve prolapse** would have been diagnosed by a low-cost **ultrasound** test.

Instead, I was ordered to check into the hospital where my health insurance company was financially raped in every way imaginable. The cardiologist insisted that I undergo an **angiogram**, a procedure that involved threading a catheter into my heart to evaluate my arteries and valves. A continuous X-ray is what guided the catheter going into my heart.

The cost in today’s dollars for the needless angiogram I endured is over $20,000. Hospital fees add to this outrageous number.

If you become infuriated when your insurance company refuses to pay for a drug or diagnostic procedure your doctor prescribes, remember that for decades, the conventional medical establishment defrauded health insurance companies by ordering all kinds of unnecessary, expensive tests. Insurance companies have become so defensive today that they often deny patients necessary diagnostics such as **magnetic resonance imaging** (MRI) that do not emit ionizing radiation.

I hope that anyone reading this article has acquired the information and fortitude to say no the
next time their doctor tries to perform an unnecessary X-ray or CT scan.

The Value of Information

When a cardiologist told me that I needed an angiogram, there was no one to turn to for guidance. Conventional medicine ruled that I needed an angiogram, there was just a chemotherapy and doctors were seldom challenged. If I could have had direct, as in that era, and doctors were seldom challenged. If I could have just called an organization like the Life Extension Foundation® back then, I would have been told that the ultrasound diagnostic procedure was all I needed.

As a Life Extension member, you are armed with cutting-edge information that can enable you to make medical choices based on hard science—not on antiquated dogma or financial bias. While some medical X-rays are unavoidable, you should inquire as to whether an ultrasound, MRI (magnetic resonance imaging), or MRA (magnetic resonance angiography) might provide alternative imaging. You might also question whether a particular X-ray is necessary, as doctors often prescribe them merely to protect themselves from liability. This may be good for doctors as it confirms their diagnosis, but bad for you as your DNA can sustain irreversible damage.

Heart scans, CT scans, whole-body scans, PET scans, and virtual colonoscopies all emit tremendous amounts of radiation and should not be used for routine screening. I remain dedicated to educating the public to avoid unnecessary CT scans and medical X-rays. Low-cost ultrasounds can sometimes substitute, whereas higher-cost MRIs can sometimes yield more detailed images. Blood tests can provide a better indicator of coronary artery disease risk than heart CT scans, while simultaneously identifying correctable risk factors such as elevated LDL, triglycerides, glucose, and C-reactive protein.

In this month’s issue, we discuss ways of protecting one’s DNA against the carcinogenic and atherogenic effects of ionizing radiation in case a CT scan or medical X-ray is required.

For longer life,

William Falloon

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These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
CR Mimetic Longevity Formula
A bottle containing 60 vegetarian capsules of CR Mimetic Longevity Formula retails for $39. If a member buys four bottles, the price is reduced to just $27 per bottle. The suggested daily dose of two capsules a day provides:

- Trans-Resveratrol 250 mg
- Trans-Pterostilbene 3 mg
- Quercetin 150 mg
- Grape seed extract 50 mg
- Black tea extract 300 mg
- Fisetin 48 mg

Optimized Resveratrol with Synergistic Grape-Berry Actives
A bottle containing 60 vegetarian capsules of Optimized Resveratrol with Synergistic Grape-Berry Actives retails for $46. If a member buys four bottles, the price is reduced to just $31 per bottle. The suggested dose of one capsule a day provides:

- Trans-Resveratrol 250 mg
- Grape-Berry Actives 85 mg
- Quercetin 60 mg
- Trans-Pterostilbene 0.5 mg
- Fisetin 10 mg

Contains yeast.

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TO ORDER THE NEW
CR Mimetic Longevity Formula or Optimized Resveratrol with Synergistic Grape-Berry Actives,
call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
More studies have been published over the past four years supporting the health benefits of vitamin D than possibly any other compound.

The good news for consumers is that vitamin D is a very low cost supplement.

The objective of taking a vitamin D supplement is to achieve 25-hydroxyvitamin D blood levels of 50 ng/mL (and higher).

Life Extension’s® exclusive analysis of over 13,000 vitamin D blood tests reveals that the minimum intake for most aging people should be around 7,000 IU a day. Some individuals need 10,000 IU of vitamin D daily.

You can choose the right dose of vitamin D3 for you from the large selection of vitamin D3 supplements below. Remember to factor in that you may be getting 1,000-3,000 IU of vitamin D in multi-nutrient formulas you already take.

- **Vitamin D3 1,000 IU • 250 capsules**
  Retail: $12.50
  Four bottle Member Price: $8.44
  Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced this 1,000 IU version. For most people, this 1000 IU potency is insufficient to attain optimal vitamin D blood levels. For smaller individuals who obtain 2,000-3,000 IU in their multi-nutrient formulas (and children), this potency of vitamin D may be suitable. Item# 00251

- **Vitamin D3 1,000 IU with Sea-Iodine* 250 vegetarian capsules**
  Retail: $22
  Four bottle Member Price: $15
  Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 1,000 IU of vitamin D3 and 1,000 mcg of iodine into one capsule makes taking these two nutrients economical and convenient. Item# 01371

- **Vitamin D3 5,000 IU • 60 capsules**
  Retail: $11
  Four bottle Member Price: $7.43
  For those obtaining 1,000-3,000 IU of vitamin D in their multi-nutrient formulas, this 5,000 IU potency is what most need to achieve optimal vitamin D blood levels. Item# 00713
  Please refer to website for allergen information.

- **Vitamin D3 5,000 IU with Sea-Iodine* 60 vegetarian capsules**
  Retail: $14
  Four bottle Member Price: $9.38
  Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 5,000 IU of vitamin D3 and 1,000 mcg of iodine into one capsule makes taking these two nutrients economical and convenient. Item# 01372
  Please refer to website for allergen information.

- **Vitamin D3 7,000 IU • 60 capsules**
  Retail: $14
  Four bottle Member Price: $9.45
  Some individuals (such as those weighing more than 180 pounds) may require higher potencies of vitamin D. When combined with 1,000-3,000 IU obtained from multi-nutrient formulas, this 7,000 IU vitamin D3 capsule should enable these individuals to attain 25-hydroxyvitamin D blood levels above the desired range of 50 ng/mL. Item# 01418
  Please refer to website for allergen information.

- **Vitamin D3 Liquid Emulsion 2,000 IU • 1 ounce**
  Retail: $28
  Four bottle Member Price: $18.75
  For those rare individuals who have difficulty absorbing enough vitamin D3 from powdered capsules, this liquid emulsion of vitamin D can be used. Item# 00864

CAUTION: Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxyvitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with hypercalcemia (high blood calcium levels). People with kidney disease, certain medical conditions (such as hyperparathyroidism or sarcoidosis), and those who use cardiac glycosides (digoxin) or thiazide diuretics should consult a physician before using supplemental vitamin D.

* If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner.

To order any of these high-potency vitamin D3 supplements, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
IN THE NEWS

Greater Vitamin K Intake Associated with Lower Diabetes Risk

A study reported in the journal *Diabetes Care* has found an association between the intake of both phylloquinone (vitamin K1) and menaquinones (vitamin K2) with a lower risk of developing type 2 diabetes.*

Researchers at University Medical Center Utrecht analyzed data from 38,094 Dutch participants in the EPIC study cohort. Over a median follow-up period of 10.3 years, 918 cases of type 2 diabetes were diagnosed.

Adjusted analysis of the data uncovered a 19% lower risk of developing diabetes in men and women whose vitamin K1 intake was among the highest 25% of subjects compared with those whose intake was among the lowest fourth.

A linear relationship was observed between lower vitamin K2 and the development of diabetes. Greater consumption of vitamin K2 was also associated with improved blood lipids and reduced levels of C-reactive protein, a marker of inflammation.

*Editor's note:* The study is one of several recent In The News articles concerning the numerous benefits of vitamin K.

—Dayna Dye

Vitamin D Status Associated with Physical Function in Older Men and Women

A presentation given on April 25, 2010 at the Experimental Biology 2010 meeting described the discovery of Wake Forest University researchers of an association between higher vitamin D levels and improved physical functioning among older individuals.*

Dr. Denise Houston of Wake Forest University's Sticht Center on Aging and her colleagues analyzed data from 2,788 healthy participants in the Health, Aging, and Body Composition study, which was designed to evaluate associations between body composition, long-term health conditions, and mobility in older individuals. Lower extremity function was evaluated at the beginning of the study and at 2 and 4 years.

Although physical function decreased on average among all participants over the follow-up period, those who had high vitamin D levels at the beginning of the study retained better function, with improved performance scores and gait speed across the 3 time points compared to those whose levels were lowest.

*Editor's note:* The study is one of only a few to examine the longitudinal relationship between vitamin D levels and physical function.

—Dayna Dye

*Presentation given on April 25, 2010 at the Experimental Biology 2010 meeting.
Supplementation with Glucosamine and Chondroitin Associated with Lower Mortality Over a 5-Year Period

An article published online in the *American Journal of Clinical Nutrition* revealed the discovery of a lower risk of death from all causes among users of the arthritis supplements chondroitin and glucosamine over an average 5-year follow-up period. *

The study included 77,673 men and women. Dietary supplement use during the 10 years prior to enrollment was documented in questionnaires completed by all participants.

Over an average 5 years of follow-up, 3,577 deaths occurred. While none of the supplements evaluated, which included individual B vitamins, fiber and other supplements, were associated with an increased risk of dying over follow-up, adjusted analysis confirmed an association between the use of glucosamine and chondroitin with reduced risk. The authors remarked that chondroitin and glucosamine may inhibit nuclear factor-kappaB (NF-kB)-dependent pathways, and that abnormal regulation of NF-kB is associated with cancer and inflammatory diseases.

*Editor’s note:* While previous research by the team, summarized in the July 24, 2009 issue of *Life Extension Update*, sought to determine the impact of multivitamins and vitamins C and E on mortality, the current investigation focused on the effect of less common supplements.

—Dayna Dye


Brain Blood Flow Possibly Boosted By Resveratrol

A recent study in the *American Journal of Clinical Nutrition* states that high doses of resveratrol may improve blood flow in the brain and potentially boost brain health. * The researchers, led by David Kennedy from the Brain, Performance, and Nutrition Research Centre at Northumbria University, ran a randomized, double-blind, placebo-controlled, crossover study, which involved 22 healthy adults who either received a placebo, or one of two doses of resveratrol (250 or 500 milligrams). Forty-five minutes after the dose was given, participants were measured for blood flow and cognitive performance for over a half hour.

The results showed that resveratrol produced a dose-dependent increase in cerebral blood flow, but no increase in the placebo group. Kennedy and his team also noticed an increase in levels of deoxyhemoglobin after both doses of resveratrol, which was indicative of increased oxygen extraction and utilization.

“The results of the current study provide the first indication in humans that resveratrol may be able to modulate cerebral blood flow variables,” the researchers wrote.

—Jon Finkel


Vinpocetine Shows Promise for Chronic Inflammation

Findings revealed in an article published online recently in the *Proceedings of the National Academy of Sciences* suggest that vinpocetine, a derivative of vincamine (from the periwinkle plant), could be useful for the treatment of chronic inflammatory diseases such as atherosclerosis, chronic obstructive pulmonary disease (COPD), arthritis, infectious diseases and cancer. * Chen Yan, PhD from the University of Rochester Medical Center and colleagues reported that vinpocetine acts as an anti-inflammatory agent in a mouse model of lung inflammation and in cell cultures.*

“What is extremely exciting and promising about these findings is vinpocetine’s excellent safety profile,” Dr. Yan remarked. “Previously, most drugs tested in this area have failed, not because of a lack of efficacy, but because of safety issues. We’re very encouraged by these results and believe vinpocetine has great potential for the treatment of COPD and other inflammatory diseases.”

*Editor’s note:* Vinpocetine is a dietary supplement that has been used for many years to help prevent cerebrovascular disorders and memory loss.

—Dayna Dye

EGCG Suppresses Lung Cancer Cell Growth

A recent study done by the Hormel Institute at the University of Minnesota, in Austin, indicates that green tea may help stop lung cancer growth.* The study, which focused on epigallocatechin gallate (EGCG), a polyphenol compound in the catechin family that is highly concentrated in green tea, set out to examine reports that EGCG suppresses lung cancer.

The study’s researchers found that EGCG interacted with the Ras-GTPase-activating protein SH3 domain-binding protein 1 (G3BP1). They also showed that EGCG suppressed the independent growth of H1299 and CL13 lung cancer cells, which contain a large amount of G3BP1 protein.

Additional results showed that EGCG effectively attenuated G3BP1 downstream signaling, including extracellular signal-regulated kinase and mitogen-activated protein kinase/extracellular signaling-regulated kinase.

The researchers concluded that green tea, which is one of the most popular beverages in the world, may in fact be a potent cancer fighter. The studies strongly indicated that green tea, via its EGCG content, suppresses lung tumorigenesis through its binding with G3BP1.

Editor’s note: Life Extension has advocated the use of green tea as a powerful antioxidant for years. This study is yet another confirmation that supplementing with green tea extract can be highly beneficial to the body.

—Jon Finkel


Broccoli Compound Targets Breast Cancer Stem Cells

In research conducted at the University of Michigan, a compound known as sulforaphane, found in broccoli and broccoli sprouts, was demonstrated to target cancer stem cells in cell cultures and in mice. Cancer stem cells, which are not destroyed by chemotherapy, are believed to be involved in the ability of breast cancer to recur, grow, and spread.*

Duxin Sun, PhD and colleagues injected varying concentrations of sulforaphane derived from broccoli extract into mice implanted with human breast cancer tumors. Examination of the animals’ tumors uncovered a substantial reduction in cancer stem cells, while normal cells did not appear to be significantly affected. Additionally, cancer cells derived from animals that received sulforaphane that were re-implanted into other mice failed to form tumors.

“Sulforaphane has been studied previously for its effects on cancer, but this study shows that its benefit is in inhibiting the breast cancer stem cells,” Dr. Sun stated.

Editor’s note: The concentrations of sulforaphane tested in the study were higher than those provided by normal consumption of broccoli or its sprouts.

—Dayna Dye

* Clin Cancer Res. 2010 May 1.
Transdermal Menopausal Hormones May Be Most Effective

Until recently, estrogens and androgens were commonly administered orally to patients to improve quality of life for postmenopausal women; however, transdermal hormone therapy is beginning to replace it.* With this cutting-edge delivery system, estrogen and testosterone are dosed into the microvascular circulation directly through the skin; this avoids a first-pass hepatic transformation or deactivation of the dosed estrogen or testosterone.

In this review, done by the Division of Reproductive Endocrinology and Infertility at the Warren Alpert Medical School of Brown University, Women and Infants Hospital, scientists examined recent clinical trials involving transdermal estrogen and testosterone in postmenopausal women.

The scientists concluded that transdermal estrogen and testosterone, when administered to the proper patients, significantly and safely enhances the quality of life. These advantages may lead to increased usage and wider popularity of this delivery system.

—Jon Finkel


Obesity Linked to Increased Availability of Unhealthy Foods

The alarming trend of increased childhood obesity seems to be linked to increased intake of unhealthy foods rather than decreased energy expenditure, according to a report from Neal Barnard, president of the Physicians Committee for Responsible Medicine.*

Dr. Barnard analyzed food availability data maintained from 1909 to 2007. Dr. Barnard found that during that time period, per capita food availability increased as follows:

- Oils increased from 35 to 87 pounds per person per year
- Meat increased from 124 to 200 pounds per person per year
- Cheese increased from 4 to 33 pounds per person per year
- Frozen dairy products increased from 1.5 to 25 pounds per person per year

Furthermore, from 1970 to 2007, per capita availability of sweeteners increased from 119 to 136 pounds per person per year. This rise in availability of caloric sweeteners reflects a decline in beet and cane sugar and an increase in high-fructose corn syrup. Part of this may be related to the sharp increase in the availability of carbonated beverages, which increased by 57 liters (15 gallons) per person per year when comparing 2007 data to 1980 data.

“Many people have been trying to understand what has caused the obesity epidemic,” Dr. Barnard told Life Extension. “Our analysis of USDA figures shows that the big increases over the last century have been in the amount of meat, cheese, oil, and frozen desserts that people are consuming. While people tend to blame a lack of exercise, it appears that meaty, cheesy diets are largely to blame.”

—Marc Ellman, MD

For the 18 million Americans who have diabetes, *A Guide to Complementary Treatments for Diabetes* (Square One Publishers, 2010) may feel like a life raft in a sea of complicated diabetes treatments. And since most standard treatment programs help a patient control diabetes, oftentimes the things done to box in the disease are not effective at preventing the serious, life-altering complications that may come about from it.

If you or a loved one have diabetes, you are no doubt familiar with some of these terrible complications, including neuropathies, cardiovascular issues, circulation problems, retinopathy, and weight gain. The purpose of *A Guide to Complementary Treatments* is to offer natural solutions that may help keep some of these symptoms at bay or at least decrease the severity.

The author of the book, Gene Bruno, MS, MSH, is the Dean of Academics and a professor at the Huntington College of Medicine. In his introduction, he says that “the vast majority of diabetes books that I have read address issues relating to dietary modifications and the use of diabetic medications (like insulin)... *A Guide to Complementary Treatments* is different... This is a book about using dietary supplements and other complementary therapies to help treat diabetes and the most common complications that arise from it. As the name complementary implies, this book is meant to be an adjunct to the patient’s existing diet and drug program, not a replacement for that program.”

With the mission of the book clearly laid out, Bruno goes on to tackle the most persistent problems diabetics face by offering potential natural treatments that may be found in your local pharmacy. From popular antioxidants like green tea to less common herbs like *Coleus forskohlii*, Bruno introduces alternative therapies, tells the reader why they may be effective by citing scientific studies, and even offers dosing information. In addition, he writes about the possible effectiveness of physical treatments like acupuncture and tai chi. And since diet plays such an important role in treating diabetes, there’s even information about how to find your own personal chef.

As you’ve no doubt noticed, no stone is left unturned in this thorough, practical book. As Chris Kilham, author of the best-selling book *Medicine Hunter* states, “I have come to expect the highest scholarship from Gene Bruno, and that is exactly what he delivers here. This is a highly valuable health guide.”
Infl ammatory conditions debilitate millions of adults, resulting in restricted mobility and reduced strength. Infl amed joints can lead to extensive damage to surrounding connective tissues, which causes the hands, feet, and arms to become painful, swollen and stiff.

While conventional methods can produce side eff ects, Arthro-Immune Joint Support from Life Extension® combines two clinically proven plant extracts into one powerful formula to help those suffering from infl ammation.

Andrographis paniculata has received acclaim for its benefi cial eff ect on infl ammation. A Chilean study involved 60 adults who took either 150 mg andrographis extract a day or a placebo. Those taking the extract showed dramatic improvement of several outcomes, including fewer numbers of tender and/or swollen joints. For joints that remained tender and/or swollen, the intensity was lessened.

Curcumin is a compound that is universally recognized for its impressive antioxidant and fi uid-regulating properties. In an as-yet-unpublished double-blind clinical trial, an enhanced absorbing curcumin was shown to have a benefi cial eff ect on infl ammation.

Life Extension’s Arthro-Immune Joint Support contains PARACTIN® Andrographis extract, which has been used in clinical, animal and in vitro studies that have demonstrated its eff i cacy in combating infl ammation. It also contains BCM-95® Bio-Curcumin®, which is considered the gold standard curcumin, with bioavailability far superior to that of most curcumin extracts.

Life Extension’s Arthro-Immune Joint Support provides scientifically validated plant extracts that have been shown to have signifi cant salutary eff ects on tender or swollen joints. Just one capsule a day provides a potent serving of PARACTIN® and BCM-95® Bio-Curcumin®. A bottle of 60 capsules retails for $30. When a member buys four bottles, the price is reduced to only $20.25 per bottle.

CAUTION: Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your health care provider before taking this product.

To order Arthro-Immune Joint Support, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Scientists have identified specific extracts from cruciferous vegetables—such as broccoli, cauliflower, cabbage and Brussels sprouts—that help maintain healthy hormone levels. Maintaining optimal hormone balance is essential to any anti-aging strategy. Triple Action Cruciferous Vegetable Extract combines these plant extracts into the most comprehensive food-based, plant compilation for cell protection yet.

I3C (indole-3-carbinol) and DIM (di-indolyl-methane) favorably modulate estrogen metabolism and induce liver detoxification enzymes to help neutralize potentially harmful estrogen metabolites and xenoestrogens (potentially toxic, estrogen-like environmental chemicals).1,4

Extracts of broccoli, watercress, and rosemary provide glucosinolates, isothiocyanates, carnosic acid, and carnosol—bio-active compounds that have a multitude of favorable effects on estrogen metabolism and cell division.5,8 Apigenin, a powerful plant flavonoid found in plants such as parsley and celery, is also added to the formula to boost cell protection,9 while 25 mg of a natural source of benzyl isothiocyanate (BITC), are included to maintain cell health.10

For those weighing less than 160 pounds, just one capsule a day provides optimal potencies. Those weighing over 160 pounds should consider taking two capsules a day. A 60-capsule bottle of Triple Action Cruciferous Vegetable Extract retails for $24. If a member buys four bottles, the price is reduced to only $16.50 per bottle.

Those who want to obtain the benefits of resveratrol can order Triple Action Cruciferous Vegetable Extract with Resveratrol. Each capsule provides 20 mg of resveratrol in addition to the vegetable extracts and retails for $32 per 60-capsule bottle. When a member buys four bottles, the price is reduced to only $22.20 per bottle.

To order Triple Action Cruciferous Vegetable Extract, call 1-800-544-4440 or visit www.LifeExtension.com

Contains yeast and corn.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Curb Compulsive Eating Naturally
Novel Spice Extract Targets the Neurochemistry of Appetite

Do you find yourself routinely eating more than you mean to? Struggle with weight gain because you can’t exercise “portion control?” Feel bad about it—but can’t stop yourself from snacking? In other words, have you ever gotten the feeling that food is addictive?

According to the latest scientific findings, you’re right—and a novel natural intervention may now help you bring those urges under control.

In a historic study published earlier this year, a team of researchers demonstrated for the first time that the underlying biomolecular mechanisms driving millions to overeat are identical to those that lock people into the death spiral of cocaine and heroin addiction.

This landmark discovery confirms what many clinicians have long suspected: compulsive eating is as much a matter of brain chemistry as behavior.

Of course, no drug exists that can regulate appetite and induce weight loss without significant health risks. Some have proven disastrous. It was only after the lethal FDA-approved “fen-phen” drugs were shown to cause pulmonary hypertension and heart valve disease—that the agency was forced to withdraw it.

The exciting news is a natural appetite regulator has been identified that operates at the neurochemical level to help provoke “satiety”—the feeling of being full. This unique extract is derived from saffron, prized for centuries not only as a spice but also as a mood enhancer in traditional cultures.

Here you will learn of saffron’s capacity to boost serotonin, a neurotransmitter whose role in appetite and satiety is well established. You will discover how a team of French researchers uncovered the ability of saffron to dramatically decrease feelings of hunger between meals. You will also find out how just 88.25 mg twice daily of a standardized saffron extract may help you effectively modulate some of the underlying psychological factors that make you eat more than you want to, with no side effects.
Serotonin’s Role in “Emotional” Eating

Although its precise neurochemical mechanisms of action were confirmed only this year, the fundamentally psychiatric nature of what some experts call emotional eating has received clinical validation in an abundance of studies.9-12 When severe enough, it reaches the level of a compulsion—a clinically diagnosable anxiety-related disorder. Compulsive eating occurs in about 30% of obese women,13 although its prevalence in the general population greatly exceeds that number. It is strongly correlated with poor impulse control, depression,14 and relapse following weight loss.15 In keeping with anecdotal observation, research shows its victims tend to gravitate toward sweet, non-nutritious foods16 like candy and ice cream.

In one of the most compelling findings on emotional eating to date, Dutch researchers reported this year that compulsive eating can result from a common gene variant for the molecule that transports serotonin, one of the body’s primary mood regulators.17 People carrying this gene suffer from lower serotonin activity, predisposing them to depression and anxiety, especially under stress.16-20 The Dutch study revealed that teens carrying this gene indulge in emotional eating at a significantly higher rate.

Antidepressants may offer some relief from emotional eating. Unfortunately, they can be costly, lose effectiveness over time, and come with a host of side effects—from sexual dysfunction to suicidal thoughts21-23—underscoring the need for safe, low-cost options.

Thanks to a team of pioneering French scientists, a next-generation natural alternative has come to light.

Saffron Extract: A Novel Intervention

Saffron has been used in traditional Persian medicine for centuries as a treatment for insomnia and anxiety.24 French researchers Cédric Bourges and his colleagues Jacques Noury and Bernard Gout25,26 set out to corroborate these therapeutic effects and apply them to the treatment of eating disorders. They hypothesized that “through an action against the anxiety component of eating behaviors such as food compulsions, saffron could alleviate the need for food between meals.”26

They first conducted a pilot placebo-controlled study using a proprietary saffron extract in a small group of healthy-to-slightly overweight women aged 46-61.28 Their results were modest: 3.6 pounds lost, almost all of it fat weight, after 4 weeks. More striking to Bourges and his team were the significant declines in reported feelings of hunger between meals, an effect that persisted until dinner...
in 25% of women taking the saffron extract.25 In contrast, 50% of placebo recipients reported an increased desire to eat. By the end of the study, 100% of women in the saffron group reported successful reduction in daily between-meal eating, as opposed to controls, who saw no improvement.

Armed with these encouraging findings, Bourges and his colleagues launched a full-scale trial of 60 slightly overweight women 25-45 years old.26 This time, they focused specifically on women who reported frequent, anxiety-related between-meal and after-dinner snacking. Their goal was to test the saffron’s psychotropic (mood-altering) potential in helping to reduce the anxiety behind compulsive eating.

Once again, weight loss was relatively modest: over one pound at the 2-week mark versus a slight gain in the placebo group. By 8 weeks, the average weight loss had increased, reaching just over two pounds, with 26% of subjects losing up to 11 pounds. Interestingly, women taking saffron saw a significant reduction in thigh circumference.

It was the psychological effect reported in the saffron group that again proved most compelling, especially given this cohort’s susceptibility to compulsive between-meal consumption. The women reported a significant reduction in feelings of hunger before meals. They also experienced a significantly diminished “need” to snack between meals. The favorable alteration in these urges had concrete results. At baseline, women in both groups had reported an average of about 12 snacking episodes per week. After eight weeks, the average was just six episodes per week in the saffron group—a 50% reduction.

These results validated the French team’s hypothesis: something about this particular saffron extract was working to control the compulsion to eat in this vulnerable sample of women. They reported that “subjects in the saffron group felt significantly more alert and energetic than the placebo group”26—feelings that correspond with emergence from sub-clinical depression and anxiety. As noted above, depression and anxiety are the foundation for compulsive eating. The key to this saffron extract’s potency, it turned out, lay in its effects on levels of serotonin.

**The Depression Connection**

Based on the findings of Bourges’s team, it has been proposed that saffron extracts might inhibit serotonin reuptake in synapses. Inhibiting synaptic serotonin reuptake keeps this mood-elevating neurotransmitter in the brain longer, enhancing its effects and combating depression. This proposed mechanism is supported by recent animal studies demonstrating

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**Saffron Extract**

- A historic 2010 study conclusively demonstrated that the neurochemical processes behind compulsive eating and drug addiction are identical, suggesting a neurological intervention for appetite control.
- No safe, effective drug exists to favorably alter the neurochemistry of appetite, and some, like “fen-phen,” have proven deadly.
- A proprietary extract of saffron has been shown to reduce the impulses behind uncontrolled “between-meal” snacking safely and effectively.
- Scientists believe it works primarily by boosting levels of serotonin, reducing the depression, anxiety, and stress central to compulsive eating.
- Saffron extract has been shown to be as effective as the tricyclic antidepressant drug imipramine and the SSRI fluoxetine (Prozac®) in managing depression—with no side effects.
- By targeting the neurochemistry at the root of compulsive eating behavior, saffron extract serves as a safe, natural way to reduce caloric intake and induce weight loss.
Habitual Snacking: A Dangerous “Seesaw” Effect

Snacking isn’t necessarily dangerous . . . but it can be. It depends on the snack food. Every time you ingest a snack rich in sugar, you’re unknowingly subjecting your body to what clinicians call an “oral glucose tolerance test.” You’re placing a stressful demand on your body to produce excessive amounts of insulin to drive down the abrupt spike in blood sugar caused by the snack food you just ingested. This insulin spike then causes a sudden decline in blood sugar levels—and that decline triggers yet another hunger episode. The result is a “seesaw” of mutually reinforcing impulses that may culminate in a dangerous cycle of uncontrolled eating. Many compulsive eaters focus on weight management without recognizing the centrality of this extremely detrimental physiological process to their suffering. Reducing your exposure to these endless fluctuations in blood glucose is the key to taking control of your compulsion to eat. Modulating the neurochemical factors behind habitual snacking can help.

antidepressant properties in extracts of multiple parts of the saffron plant.27

Saffron extracts have also demonstrated efficacy in managing mild to moderate depression and anxiety in humans 24,27-29—the same disorders that drive emotional eating. This affords a novel alternative to antidepressant drugs.

Extracts of saffron have been proven superior to placebo for management of mild to moderate depression in a number of controlled clinical trials, consistently producing better outcomes on the standard Hamilton depression rating scale.28,30 Saffron extracts also outperformed placebo in a related study of premenstrual syndrome.31 (The premenstrual phase is often accompanied by depressed mood and caloric overconsumption.)32

Even more compelling are the comparative data on saffron and prescription antidepressants. In one study, just 30 mg of standardized saffron extract delivering active constituents such as safranal and crocin produced results similar to 100 mg of the tricyclic antidepressant
The same amount of saffron extract produced results identical to the popular selective serotonin reuptake inhibitor (SSRI) fluoxetine (Prozac®) in separate trials. Saffron produced no side effects, while the antidepressants produced a familiar list of adverse effects, including dry mouth and sedation.

Emotional and compulsive eating have ties to anxiety, as well as depression. Animal studies show that safranal possesses anti-anxiety (anxiolytic) properties without affecting coordination or motor activity. One pre-clinical model found that saffron extracts were as effective as diazepam (Valium®) at reducing manifestations of anxiety.

A complementary body of research indicates a positive role for saffron extracts containing safranal as an optimal intervention for stress and anxiety—core factors in the development of eating compulsions.

Summary

A historic 2010 study conclusively demonstrated that the neurochemical processes behind compulsive eating and drug addiction are identical—suggesting a novel neurological intervention for appetite control. While no safe, effective drug exists to favorably alter the neurochemistry of appetite, a proprietary saffron extract has been shown to reduce uncontrolled “between-meal” snacking without side effects.

At the core of saffron’s power is a scientifically validated ability to boost levels of serotonin, reducing the depression, anxiety, and stress central to compulsive eating.

**Natural Anxiety and Stress Control**

Treating anxiety with benzodiazepines like Valium® (diazepam) may be temporarily effective, but it produces significant side effects, among them impaired memory. In contrast, saffron extracts not only reduce the depression and anxiety that can lead to emotional eating—they prevent memory impairment. In fact, saffron extracts have been shown to enhance memory.

Scientists have developed a working understanding of how saffron produces these effects in the brain. Active extracts of saffron increase so-called long-term potentiation, the electrochemical mechanism underlying learning and memory at the cellular level. This effect has proven powerful enough to protect experimental animals’ brains from alcohol-induced memory loss. By an entirely different set of mechanisms, saffron extracts also protect brain cells in culture from inflammatory damage and death induced by cytokines such as TNF-alpha.

Interestingly, advances in our understanding of stress and anxiety reveal that they are accompanied by increased oxidative stress in brain cells. Earlier this year, scientific evidence emerged indicating that oxidative stress in the brain is also a positive marker for compulsive behavior. Accordingly, there’s evidence that saffron’s capacity to limit emotional eating may be related to its antioxidant capacity.
References


Complete Skin Protection
From Inside Out

Scientists are realizing that skin needs to be protected against external factors such as sunlight, and also against internal damage caused by emotional stress. This is because our emotions, particularly stressful ones, release a wave of stress hormones such as cortisol that prematurely age the skin.

Fortunately, emerging research suggests that a natural herb called ashwagandha can protect and enhance psychological health as seen in a recent human trial. In this study, just 125 mg of a patented ashwagandha extract once a day led to a 14.5% reduction in cortisol levels in 98 chronically stressed individuals. This dose also resulted in a 13.2% increase in levels of the anti-aging hormone DHEA, which helps maintain the youthfulness of skin cells. Overall, the ashwagandha-treated subjects experienced up to 62% reduction in anxiety levels compared with virtually no change in the placebo group.

The impressive results from this trial have led to the incorporation of ashwagandha into a new skin-protection formula called Enhanced FernBlock® with Sendara™. As the name suggests, this formula also contains FernBlock®, the revolutionary oral supplement introduced by Life Extension® in July 2008 that acts as an internal sunscreen against damaging solar radiation.

FernBlock® is a natural extract derived from the fern plant Polypodium leucotomos. Extensive clinical studies document its ability to provide remarkable skin protection by inhibiting the absorption of harmful ultraviolet (UV) rays and quenching DNA-corrupting free radicals. FernBlock® also diminishes the consequences of excessive UV radiation by favorably altering a number of changes in skin cells that cause premature skin aging.

Enhanced FernBlock® with Sendara™ is complemented with a powerful antioxidant called Phyllanthus emblica. This natural extract blocks a chemical reaction that generates several types of skin-damaging free radicals, thus shielding the skin against the destruction of collagen and other dermal matrix proteins. An in vitro study using a patented extract of both ashwagandha and Phyllanthus emblica demonstrated an impressive 54% inhibition of collagen-degrading enzymes and an 86% inhibition of those that break down hyaluronic acid—the skin’s natural moisturizer.

The unique combination of natural ingredients in Enhanced FernBlock® with Sendara™ has been scientifically proven to help skin look and feel good from the inside out. This formula is designed to complement topical sunscreens for complete skin protection.

A bottle containing 30 vegetarian capsules of Enhanced FernBlock® with Sendara™ retails for $39. If a member buys four bottles, the cost is only $26.25 per bottle.

Contains corn and rice.

References

Patent Pending Sendara™ is a trademark of NutraGenesis LLC. FernBlock® is a registered trademark of Industrial Farmaceutica Santabria, S.A.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
An increasing number of scientists recognize the critical need to protect the arterial wall against low-density lipoprotein (LDL) oxidation and inflammatory insults.

Research has shown that unique extracts present in black tea called theaflavins can have multiple applications for arterial health.1 Theaflavin Standardized Extract contains a number of beneficial flavonoids found naturally in tea leaves that help support levels of cholesterol that are already within the normal range.1

Theaflavins have been shown in human studies to protect against LDL oxidation and favorably affect endothelial function,2 thus helping to maintain healthy circulation.

Scientists have also found that black tea flavonoids possess strong antioxidant properties, which can help mitigate oxidative damage to cells and tissues from free radicals.3 In addition, theaflavins have been found to be helpful in regulating key inflammatory mediators in the body, thus helping to preserve cellular integrity.4,5

A bottle of 30 350-mg vegetarian capsules of Theaflavin Standardized Extract retails for $18. If a member buys four bottles, the cost is only $12 per bottle.

References

This product contains a black tea extract which is licensed from Applied Food Sciences, Inc. and is protected by US Patent Nos. 6,811,799 and 6,602,527.
As we get older our eyes become vulnerable to a variety of insults that can cause irritation, dry eye, and structural dysfunctions. Applying lubricating eye drops can alleviate eye discomfort.

Life Extension®’s Brite Eyes formula provides the best daily eye drops without irritation.

Brite Eyes contains two proven lubricants (hydroxy-methylcellulose and glycerin) that are FDA-approved for ophthalmic use. Unlike conventional eye drop formulas, these lubricants are preserved with potent antioxidants and anti-glycating agents.

The Brite Eyes formula is buffered in a way to make it soothing to the eye. The suggested use of Brite Eyes III is to apply 1 to 2 drops in each eye every day.

Each box of Brite Eyes III contains two individual vials that provide 5 ml each. The reason for putting Brite Eyes into individual vials is to reduce the risk of bacterial contamination. Having small vials also makes it convenient for consumers to keep Brite Eyes readily accessible at home, the office, in one’s purse or pocket, and other places where access to a soothing eye drop is needed.

The retail price for a box containing two 5-ml vials of Brite Eyes III is $34. If a member buys four boxes, the price is reduced to $24 per box.

To order Brite Eyes III today, call 1-800-544-4440 or visit www.LifeExtension.com
Do you often find yourself snacking between meals? Resolve to stop, but can’t help reaching for that extra cookie? Are you losing the “battle of the bulge” because you have difficulty exercising portion control?

A next-generation, 100% natural nutrient may be the answer.

**An Ancient Solution to a Modern Problem**

Satiereal® is a clinically studied, proprietary extract of saffron. You know saffron as a spice. What you may not know is that it has been prized in traditional cultures since ancient Persia as a way to enhance mood and relieve stress.1,2

Previously available only in Europe, this standardized saffron extract provides support for healthy body weight by targeting some of the emotional factors that make you eat more when you’re trying to eat less.

The suggested daily serving of just two 88.25 mg capsules of new Optimized Saffron with Satiereal® delivers the active constituents safranal and crocin. They have been shown to modulate certain serotonergic receptors in the brain to support mood.3-6 In clinical studies,7,8 women taking Satiereal® experienced . . .

1. 100% reduction in the desire to snack
2. 50% fewer instances of eating between meals
3. Less hunger
4. Moderate weight loss
5. More energy
6. Better mood

**Feel Better About Food Again**

In fact, they reported feeling better about themselves and better in general. The result was a greater sense of control over between-meal snacking, and a change in eating behavior, without that “jittery feeling” or other undesirable effects.8

The same can happen for you.

No more “grazing.”

No more midnight “kitchen raids.”

Strengthen your resolve. Let Optimized Saffron with Satiereal® help you break the cycle of eating more than you want to—and eat what you want, when you want.

A bottle containing 60 vegetarian capsules of Optimized Saffron with Satiereal® retails for $36. If a member buys four bottles, the cost is just $24 per bottle.

**References**

Combating the “Diabesity” Epidemic

The combination of diabetes and obesity—now termed “diabesity” by some experts—is the largest epidemic the world has ever faced.¹ By some estimates, the total number of individuals with obesity-induced diabetes will escalate to 366 million worldwide by 2030,² with an 8-10 year³ reduction in their life expectancy.

The harbingers of diabesity can go undetected for years, as conventional medicine persists in late detection by “waiting” for blood markers to reach critical levels, then adopting failed strategies that can worsen the patient’s outlook for survival.⁴

Aging individuals are told to focus on blood sugar levels without an explanation of the lethal factor linking obesity and diabetes: inflammation.⁵,⁶ Fat cells generate inflammatory cytokines. Excess fatty tissue floods the body with these harmful signaling molecules, triggering a pathological cascade across a range of additional bodily tissues, impairing their response to insulin and leptin, and disabling their ability to properly metabolize sugars, fats, and protein.⁷

This deadly feedback loop may commence long before full-blown diabetes manifests,⁸ suggesting the need for a multimodal prevention strategy implemented far in advance of early signs and symptoms.

In this article, you will learn how curcumin imposes an anti-inflammatory blockade via multiple physiological pathways—including those associated with diabetes onset. You will also discover how it enhances glucose control and insulin sensitivity, quells inflammation at the cellular level, and restores balance across a range of systems normally ravaged by diabetes. Adding to the extraordinary benefits of curcumin, new studies have shown that carnitine, vitamin E, and magnesium complement curcumin in controlling the many destructive elements of high blood sugar. Together, all these nutrients can make a significant difference in the battle against diabesity. >>
Curcumin: Glucose Control and Increasing Insulin Sensitivity

Experiments in type 2 diabetic animals reveal that curcumin suppresses spikes in glucose levels via multiple mechanisms. A curcumin complex was shown to significantly reduce blood glucose and lipid levels in diabetic rats and restore blood pressure and endothelial function to normal. PPAR (peroxisome proliferator-activated receptor) is a group of nuclear receptor proteins that modulate metabolism through helping regulate gene expression and facilitating sugar uptake and utilization from the blood. Activation of PPAR is one way that curcumin exerts its glucose-lowering effects.

Another way curcumin brings blood sugar under control is in the liver, where it decreases activity of enzymes that make new sugar molecules, while increasing activity of enzymes that break down and store sugar. To do this curcumin activates a liver complex called AMP-activated kinase (AMPK) at a rate that may be higher than metformin, while simultaneously reducing expression of glucose-producing genes.

Curcumin further contributes to glucose control in diabetes by increasing the number of insulin receptors on cell membranes and improving their insulin-binding capacity, restoring both to near-normal levels. Increasing sugar uptake from blood, decreasing new glucose formation, and increasing insulin's effectiveness are three entirely independent means by which curcumin lowers blood sugar.

Curcumin Fights Oxidation and AGEs: the Inflammation Blockade

Advanced glycation end-products (AGEs) form when glucose cross-links with functional proteins, rendering them dysfunctional and destroying cell membranes and vital enzyme systems. The resulting inflammation produces oxidant stress and further tissue injury. Curcumin blocks formation of AGEs and prevents many of their oxidant-induced, inflammation-promoting, tissue-damaging effects.

For example, blindness caused by diabetic retinopathy is a direct result of capillary overgrowth from long-term exposure to high glucose levels and resultant inflammation. Curcumin was shown to help suppress some of the AGE-induced inflammatory changes that promote diabetic retinopathy. It also lowered levels of growth factors that promote capillary proliferation.

Cataracts, another vision-threatening consequence of diabetes, result from damage to delicate proteins in the eye's lens, producing cloudiness and eventually opacity. Curcumin delayed progression and maturation of cataracts in diabetic rats, countering the oxidative stress and reversing changes associated with lipid peroxidation.
Curcumin also boosts levels of natural antioxidants that diabetes depletes, including glutathione, superoxide dismutase (SOD), and catalase—restoring them to normal levels.\textsuperscript{30-32} As a result, curcumin helps reduce the amount of oxidized fat molecules in the circulation, which are major contributors to cardiovascular disease.\textsuperscript{33} And curcumin’s reduction of AGEs in connective tissue helps reduce the chemical cross-linking that adds unwanted stiffness to blood vessels, skin, and other tissues in diabetics.\textsuperscript{34}

Brain cells in diabetics are especially vulnerable to oxidative stress and lipid peroxidation because of their lipid-rich cell membranes. Curcumin metabolites prevent brain lipid peroxidation in diabetic rats, potentially protecting brain cells from long-term injury.\textsuperscript{35} Acting by a completely different mechanism, curcumin further protects diabetic brain cells by preventing oxidative damage to mitochondria and boosting levels of the energy compound adenosine triphosphate (ATP) in brain tissue.\textsuperscript{36}

Diabetics undergo acceleration of inflammatory changes in blood vessel walls that produce endothelial dysfunction and ultimately atherosclerosis. Curcumin supplements in animals markedly reduce dangerous markers of inflammation such as interleukin-6 and tumor necrosis factor-alpha (TNF-alpha).\textsuperscript{31} And curcumin reduces production of inflammatory cytokines in fat tissue itself, helping to lower the overall burden of inflammation and insulin resistance produced by obesity.\textsuperscript{19,37}

\begin{itemize}
  \item The combination of diabetes and obesity—now termed “diabesity” by some experts—is the largest epidemic in human history.
  \item The harbingers of diabesity can go undetected for years, as conventional medicine focuses on various biomarkers while ignoring the key factor that links obesity and diabetes: inflammation.
  \item Curcumin has been shown to impose an anti-inflammatory blockade across multiple systems ravaged by “diabesity.”
  \item Curcumin was shown to increase glucose metabolism in the liver while simultaneously reducing expression of glucose-producing genes.
  \item Curcumin intervenes at nearly every stage in the process of diabetic progress, enhancing liver, kidney, and endothelial function, providing optimal cardiac defense, and boosting levels of primary antioxidants while suppressing pro-inflammatory cytokines generated by fatty tissue.
  \item Carnitine helps the body burn fat as energy. Formulations of carnitine such as L-carnitine, acetyl-L-carnitine, and propionyl-L-carnitine have been found to help improve insulin sensitivity and blood lipid profiles in individuals with diabetes and pre-diabetes.
  \item Vitamin E helps reduce oxidative stress and improve insulin action.
  \item Magnesium is frequently deficient in people with diabetes. Magnesium supplementation has been found to improve insulin sensitivity and promote healthy blood pressure levels.
\end{itemize}
Advanced Cardiovascular Defense with Curcumin

The over-oxidized environment in diabetics’ blood and tissues puts a huge strain on vascular health. This hyperoxidation is the root cause of diabetics’ markedly increased risk of stroke, heart attack, and peripheral vascular disease. Curcumin combats vascular destruction in diabetics in several ways.

Curcumin decreased blood sugar and simultaneously reduced vessel-damaging lipid peroxidation to near normal in diabetic rats. It also normalizes the out-of-control lipid profiles so common in diabetics. Animals fed a high-cholesterol diet that were supplemented with curcumin had a decrease in total cholesterol of 21% and of harmful low-density lipoprotein (LDL) by 43%, but an increase in beneficial high-density lipoprotein (HDL) of 50%.

Curcumin exerts direct effects on blood vessels, which are vulnerable to oxidant and inflammatory damage. It can help to restore the vital vascular reactivity needed to control blood pressure and flow. Curcumin supplements in diabetic rats also have beneficial effects on blood vessel tone in heart muscle, and protect small blood vessels in the eye from endothelial dysfunction. In addition, curcumin inhibits platelet aggregation that can contribute to heart attacks and strokes.

In 2008, researchers in India published a landmark human study showing how curcumin improves endothelial function in type 2 diabetics. They tested the supplement head-to-head against the prescription cholesterol-lowering drug atorvastatin (Lipitor) and a placebo. At the end of the study, significant improvement in endothelial function occurred in both the drug and the curcumin supplemented groups to a similar extent, while placebo recipients had no change. At the same time, the supplemented group and the drug-treated group both showed significant reductions in markers of oxidative stress and inflammatory cytokines. This study alone supports routine curcumin supplementation in diabetics, who are at extreme risk for the consequences of endothelial dysfunction.

Curcumin Provides Kidney and Liver Protection

Diabetes wreaks havoc on vital organs, particularly those with high blood flows such as the kidney and liver. End-stage renal disease (ESRD) is a tremendous cause of suffering and death among diabetics; while

One gram of L-carnitine orally three times daily over 12 weeks significantly lowered fasting blood sugar in middle-aged adults with type 2 diabetes.
non-alcoholic steatohepatitis (also called “fatty liver disease”) begins its damaging effects even in early-stage insulin resistance. No drug exists to effectively prevent progression of these diabetic complications, but curcumin’s multi-targeted capabilities offer distinct protection.

Dietary curcumin supplements significantly reduced kidney lesions in diabetic laboratory animals and slowed progression of the illness. Treatment with curcumin significantly reduced both kidney dysfunction and oxidative stress in diabetic rats. A 2009 study revealed one of the ways it works: curcumin’s powerful anti-inflammatory, gene expression-modulating activities were blocking production of growth factors and other proteins that lead to damaged kidney tissue.

Curcumin prevents dietary-induced fatty liver, prevents activation of the liver inflammatory cells that produce the condition, and can also ameliorate fatty liver caused by alcohol intake in diabetic rats. In a laboratory study, diabetic rats displayed abnormal liver function tests. Curcumin supplementation for 45 days reversed these abnormalities to near normal. This suggests that curcumin may be helpful for people with diabetes, who have a higher incidence of liver function test abnormalities than people who do not have diabetes. In 2009, it was shown that curcumin achieves these effects by suppressing destructive lipid-handling genes, simultaneously stimulating PPAR-gamma activity to improve liver cells’ energy utilization.

Curcumin Protects Nerve and Brain Cells

Nerve and brain tissue come under direct attack by high sugar levels in diabetic patients, resulting in severe pain called diabetic neuropathy and in cognitive disturbances ranging from memory loss to severe diabetic encephalopathy and dementia. Curcumin has proven effective in preventing or mitigating both.

Neuropathic pain is recognized as one of the most difficult to treat, and frustrates patients and physicians alike. Indian researchers experimentally induced the condition in diabetic rats, then supplemented them with curcumin. The treatment significantly attenuated excessive painful response to mild stimuli (hyperalgesia). The effects were even more pronounced when supplementation was combined with insulin.

Diabetic encephalopathy is a complex and poorly-understood process of accelerated brain aging and cognitive decline related both to high glucose levels and insulin deficiency in brain tissue. Chronic treatment with curcumin reversed the extreme oxidant damage and inflammation in the brains of diabetic rats, and markedly improved their performance on tasks of memory and cognition.

Carnitine Improves Blood Sugar and Lipids in Diabetes

Carnitine is a small amino acid-derived molecule used by cells to shuttle fats into mitochondria, where they are burned for energy. Diabetic tissue, especially cardiac muscle, can accumulate lipids that impair function. Both aging and obesity reduce carnitine levels, contributing to mitochondrial aging and loss of metabolic control. That makes carnitine a very appealing supplement for its ability to promote mitochondrial health and fat/sugar utilization before problems arise.

Human carnitine studies in diabetes are compelling. Given intravenously to insulin-resistant diabetics, L-carnitine or acetyl-L-carnitine improved insulin sensitivity, glucose uptake and effective utilization from the bloodstream, while improving efficiency of energy utilization. One gram of L-carnitine orally three times daily over 12 weeks significantly lowered fasting blood sugar in middle-aged adults with type 2 diabetes.
Because of its unique impact on fat utilization, carnitine is also highly effective at improving diabetics’ abnormal lipid profiles, alone or in combination with a statin drug like simvastatin (Zocor).65-67 That’s big news for diabetics, who must optimize their lipid profiles in order to avoid devastating cardiovascular consequences.

Acetyl-L-carnitine supplements (2 grams daily) safely reduced arterial hypertension, insulin resistance, and impaired glucose tolerance, while boosting levels of the protective fat-produced cytokine adiponectin in non-diabetic patients at risk for developing diabetes.68 Daily supplementation with 2 grams of L-carnitine reduced levels of dangerous lipoprotein(a) and oxidized LDL in patients with type 2 diabetes.69,70

Carnitine’s energy-boosting effects are especially important in heart tissue. Long-term oral supplementation with acetyl-L-carnitine preserved vital cardiac nerve function in diabetic patients, whereas placebo-treated subjects suffered significant loss of function.71 Propionyl-L-carnitine improved cardiovascular function in diabetics undergoing coronary bypass surgery.72 Diabetics frequently suffer painful peripheral vascular disease, the narrowing and hardening of blood vessels in the extremities that makes walking difficult and painful. Supplementation with 2-3 grams/day of propionyl-L-carnitine improves symptoms and performance, increasing mean walking distance, measures of blood perfusion, and pain scores.73,74 One study even showed that patients supplemented with 1,200 mg propionyl-L-carnitine intravenously each day could also reduce doses of their prescription glucose-lowering medications.75 Erectile dysfunction is a very specific form of peripheral vascular disease common in diabetics, and propionyl-L-carnitine added to drug treatment improved performance in men unresponsive to drug treatment alone.76-78

With additional evidence that 1-2 grams acetyl-L-carnitine supplementation daily can mitigate painful diabetic neuropathy, it’s clear that carnitine belongs in a responsible anti-diabetic supplement regimen.79,80

Vitamin E and Magnesium Reduce Inflammation, Improve Insulin Sensitivity

Consistent vitamin E supplementation (500-600 mg daily) helps improve vascular function and increases magnesium levels inside cells in type 2 diabetic patients while reducing elevated oxidative
stress markers. Vitamin E supplementation with gamma-tocopherol also quenches biomarkers of oxidation and inflammation in patients with metabolic syndrome, potentially preventing progression to full-blown diabetes. 

Vitamins E and C together lowered inflammation and improved insulin action in pre-diabetic patients. Even more dramatically, an antioxidant vitamin combination rich in vitamin E (800 mg vitamin E, 500 mg vitamin C, 10 mg beta-carotene) improved insulin sensitivity, reduced dangerous endothelial adhesion molecules, and increased protective adiponectin levels in obese young adults. This late-breaking news is impressive evidence that we can break the cycle of diabesity.

Oral magnesium supplements improve insulin sensitivity and lower hemoglobin A1c levels in type 2 diabetics and in non-diabetic adults. A large review of previous studies in 2006 established that oral magnesium supplementation (360 mg/day) can reduce fasting glucose levels and raise beneficial HDL in type 2 diabetic patients. And a 2009 study showed that daily oral magnesium supplementation (450 mg) significantly lowered both systolic and diastolic blood pressure in hypertensive type 2 diabetics who were also taking the ACE inhibitor captopril.

Long term magnesium supplementation (300 mg/day) slowed the development of peripheral neuropathy in type 1 diabetics. A clinically important study in 2008 revealed that depressed elderly diabetic patients with low magnesium levels responded to oral magnesium supplements (450 mg/day) as well as they did to the powerful prescription antidepressant imipramine.

A daily combination supplement including 100-150 mg vitamin E and 200 mg magnesium along with vitamin C and zinc significantly increased HDL in a group of type 2 diabetics. And very recently we learned that the combination of vitamin E and magnesium also works together to decrease plasma lipids and blood viscosity (thickness) in diabetic rats, heralding even greater cardiovascular benefits of these essential nutrients.

Antioxidant vitamins and minerals such as vitamin E and magnesium are depleted in diabetes, while both nutrients have been shown to improve insulin action. At the same time, common lipid-lowering drugs used by diabetics further deplete magnesium levels. Experts are therefore deeply interested in these nutrients as beneficial supplements for diabetics and obese pre-diabetics.

The combination of diabetes and obesity—now termed “diabesity” by some experts—is the largest epidemic in human history, estimated to escalate to 380 million victims worldwide by 2025. The harbingers of diabesity can go undetected for years, as conventional medicine focuses on antiquated blood references ranges while ignoring the key factor that links obesity and diabetes: inflammation.

Curcumin has been shown to impose an anti-inflammatory blockade across multiple systems ravaged by “diabesity.” Curcumin increases glucose metabolism in the liver, while simultaneously reducing expression of glucose-producing genes. It intervenes at nearly every stage in the process of diabetic progress, enhancing the endothelial and multi-organ function, providing optimal cardiac defense, and boosting levels of primary antioxidants while suppressing pro-inflammatory cytokines generated by fatty tissue.

Carnitine helps promote healthy blood sugar and blood lipid levels, while vitamin E and magnesium improve insulin sensitivity, reduce oxidative stress, and support healthy blood pressure. Together, these nutrients synergize to provide powerful defense against the epidemic of diabesity.

If you have any questions on the scientific content of this article, please call a Life Extension Health Advisor at 1-866-864-3027.

References


According to the *Proceedings of the National Academy of Sciences*, alpha tocopherol (regular vitamin E) displaces critically important gamma tocopherol in the cells.\(^1\) While alpha tocopherol inhibits free-radical production, gamma tocopherol is required to trap and neutralize existing free radicals.\(^2\)

Four prestigious scientific journals have highlighted gamma tocopherol as one of the most critically important forms of vitamin E for those seeking optimal health benefits.

Most commercial vitamin E supplements contain little, if any, gamma tocopherol. They instead rely on alpha tocopherol as the primary ingredient. However, it is gamma tocopherol (not the alpha form) that quenches peroxynitrite, the free radical that plays a major role in the development of age-related decline.\(^2,3\)

**SESAME LIGNANS: The Natural Vitamin E Booster**

Life Extension\(^*\) has uncovered research suggesting that adding sesame lignans to gamma tocopherol may significantly enhance its beneficial effects. Sesame and its lignans have been shown to boost antioxidant levels and help maintain already-normal blood pressure.*\(^*\)

In a human study that combined gamma tocopherol with sesame lignans, gamma tocopherol/sesame was 25% more effective than gamma tocopherol/tocotrienols in suppressing tissue measurements for free-radical and inflammatory damage.\(^4,5\) Since tocotrienols are considered nature's most potent antioxidants, the fact that low-cost gamma tocopherol with sesame is more effective is a remarkable finding.

Life Extension has fortified the popular Gamma E Tocopherol supplement with standardized sesame lignans. Consumers obtain superior benefits at a much lower cost.

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**WORLD’S MOST COMPREHENSIVE VITAMIN E FORMULA!**

Each softgel of Gamma E Tocopherol with Sesame Lignans provides:

- Gamma tocopherol 215.4-244.12 mg
- Delta tocopherol 89.75-125.65 mg
- Alpha tocopherol 17.95-35.9 mg
- Beta tocopherol 0-7.18 mg
- Sesame seed (*Sesamum indicum*) lignan extract 20 mg

This formula provides potent doses of gamma tocopherol along with sesame lignan extract to augment the antioxidant effects of gamma tocopherol.

The retail price for 60 softgels of Gamma E Tocopherol with Sesame Lignans is $32. If a member buys four bottles, the price is reduced to only $21.75 per bottle.

**To order Gamma E Tocopherol with Sesame Lignans,**
call 1-800-544-4440
or visit www.LifeExtension.com

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**Antioxidant Vitamins & Cancer.** Some scientific evidence suggests that consumption of antioxidant vitamins may reduce the risk of certain forms of cancer. However, the FDA does not endorse this claim because this evidence is limited and not conclusive.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
A recent study in the journal *Science* concluded that in primates a calorie-restricted diet can delay disease onset and age-related mortality. While *Life Extension®* readers understand the benefits of calorie restriction, that doesn’t make it any easier to cut back on one of the major calorie culprits in the American diet: refined sugar.

Sucrase is an enzyme that breaks down sucrose in the digestive tract for absorption into the bloodstream. **Phase 3™** is a new, patented compound that functions as a beneficial modulator of sucrase. By delaying the rapid absorption of sucrose, **Phase 3™** can help support the healthy release of insulin and sugar into the bloodstream in response to sucrose ingestion that so readily converts to body fat.

**Green Tea Phytosome Cellular Energy Enhancer**

The ability of green tea extracts to inhibit the breakdown and absorption of dietary fat has been the subject of research studies across the globe. Mounting scientific research has documented the metabolic effects of green tea polyphenols. A proprietary phytosome complex has shown an ability to increase the absorption of green tea polyphenols into the bloodstream better than conventional tea extracts — resulting in peak plasma levels of the critical green tea polyphenol epigallocatechin-3-gallate.

Participants in a human clinical trial showed an average weight loss of 30 pounds and a 10% reduction in waist circumference in 90 days when 300 mg/day of this new green tea phytosome was taken in conjunction with a reduced-calorie diet. The placebo group that followed the same reduced-calorie diet lost only 9.9 pounds and only 5% of their waist size.

The **Alpha-Amylase Enzyme**

Aging reduces our ability to utilize the carbohydrates (and fats) that constitute what most would consider part of a healthy diet. The result is that as we grow older, our bloodstreams become chronically bloated with glucose and triglycerides in direct contrast to the youthful metabolic profile we have in our younger years. Emerging scientific research suggests that the alpha-amylase enzyme plays an undesirable role in the digestion of dietary carbohydrates and subsequent absorption of calories from starch and sugar.

A natural bean extract (*Phaseolus vulgaris*) moderates alpha-amylase activity. In a human trial in which all overweight participants were placed on a 2,000–2,200-calorie, carbohydrate-rich diet, those taking *Phaseolus vulgaris* lost 6.5 pounds and 1.2 inches in waist size in only 30 days compared with 0.8 pounds and 0.2 inches in the placebo group.

The **Alpha-Glucosidase Enzyme**

Another intestinal enzyme that enables carbohydrate absorption is alpha-glucosidase. A patented seaweed extract (*InSea²™*) has demonstrated the ability to help maintain healthy levels of both alpha-glucosidase and alpha-amylase. When given to laboratory animals, this seaweed extract reduced after-meal (postprandial) glucose elevations by up to 90% compared with non-supplemented animals.

Remember, young healthy individuals rapidly convert ingested fats-sugars into energy. Age-related changes decrease our metabolic capacity to efficiently utilize dietary fats-sugars. It is thus paramount for aging people to reduce their absorption of excess calories. By taking nutrients before each meal that reduce the activity of carbohydrate-fat digesting enzymes, the calorie burden is significantly reduced.

**To order Optimized Irvingia with Phase 3™ Calorie Control Complex,**
call 1-800-544-4440 or visit www.LifeExtension.com
Leptin Sensitivity

Fat cells (adipocytes) secrete a hormone called leptin that tells our brain we have eaten enough. Leptin can also facilitate the breakdown of stored triglycerides in our adipocytes via the process of lipolysis. Heavy individuals have startlingly high blood levels of leptin, indicating that their cells have become resistant to the leptin that is supposed to prevent them from putting on so many fat pounds.

An extract from a West African food called Irvingia gabonensis has been shown to help support leptin sensitivity in overweight people. In a recently published study, Irvingia demonstrated beneficial effects upon leptin blood levels, followed by weight loss and inches off the waistline. In addition to supporting healthy leptin sensitivity, Irvingia has demonstrated the following beneficial effects on key aspects of metabolism:

- Glycerol-3-phosphate dehydrogenase is an enzyme involved in the complex biochemical process that converts ingested starch and sugar calories to stored body fat. Irvingia has been shown in studies involving fat cells to reduce the activity of glycerol-3-phosphate dehydrogenase, which may help reduce the impact of starch and sugar calories on body fat.

- Scientific research on fat cells suggests that Irvingia has alpha-amylase-inhibiting properties (like InSea™ and Phaseolus vulgaris), which can help support a slowing of the rate of carbohydrate absorption from the intestines and a reduction of the caloric impact of starchy and sugary foods.

- Adiponectin is a hormone involved in helping to maintain insulin sensitivity on the membranes of energy-producing cells. Big fat cells produce less adiponectin, and overweight people need to be especially concerned about maintaining healthy levels of adiponectin to support insulin sensitivity and metabolic fitness. Scientific data suggests that Irvingia helps support healthy adiponectin levels.8

Optimized Irvingia with Phase 3™ Calorie Control Complex

In reviewing the remarkable effects demonstrated by these natural compounds, one might think that any one of them might be a solution to their weight problem. The reality is that aging individuals often fall victim to many molecular factors that can sabotage the best weight-loss programs.

Optimized Irvingia formula provides a combination of nutrients that combat age-related fat accumulation via the following eight distinct mechanisms:

1. Delaying digestion and absorption of sucrose.
2. Enhancing resting energy expenditure at the cellular level.
3. Slowing the absorption of dietary fat from the intestines.
4. Moderating alpha-amylase enzyme activity to reduce carbohydrate absorption in the bloodstream.
5. Reducing alpha-glucosidase enzyme activity to further slow the absorption of starches and sugars into the bloodstream.
6. Supporting leptin sensitivity to reduce hunger and stimulate lipolysis.
7. Supporting youthful levels of adiponectin to help maintain healthy insulin sensitivity.
8. Moderating glycerol-3-phosphate dehydrogenase enzyme activity to reduce the amount of ingested starches that are converted to triglycerides and stored as fat.

Summary of Human Studies with Optimized Irvingia Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Study</th>
<th>Treatment vs Placebo</th>
</tr>
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<tbody>
<tr>
<td>Green Tea Phytosome Extract</td>
<td>100 overweight subjects placed on a hypocaloric diet (men: 1,850 calories; women: 1,350 calories) randomized to receive 300 mg/day of green tea phytosome extract or placebo for 90 days</td>
<td>Weight loss 30.1 pounds vs. 9.9 pounds</td>
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<tr>
<td></td>
<td></td>
<td>Waist size reduction 10% vs. 5% (14% vs. 7% in men)</td>
</tr>
<tr>
<td>Phase 2™ White Kidney Bean Extract</td>
<td>60 overweight subjects placed on a 2,000-2,200 calorie, carbohydrate-rich diet and randomized to either 445 mg/day of white kidney bean extract or placebo for 30 days</td>
<td>Weight loss 6.5 pounds vs. 0.8 pounds</td>
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<tr>
<td></td>
<td></td>
<td>Waist size reduction 1.2 inches vs. 0.2 inches</td>
</tr>
<tr>
<td>Integra-Lean® Irvingia Gabonensis Extract</td>
<td>102 overweight subjects randomized to either 150 mg of Irvingia twice daily or placebo for 10 weeks</td>
<td>Weight loss 28 pounds vs. 1.5 pounds</td>
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<tr>
<td></td>
<td></td>
<td>Waist size reduction 6.4 inches vs. 2.1 inches</td>
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</table>

Two capsules of Optimized Irvingia with Phase 3™ Calorie Control Complex provide:

- Phase 3™ L-Arabinose and chromium complex ..............................550 mg
- Green Tea Phytosome (decaffeinated) extract ...........................150 mg
- Phase 2™ Phaseolus vulgaris white kidney bean extract ...........445 mg
- InSea™ seaweed extract ................................................................125 mg
- Irvingia gabonensis extract ..................................................150 mg

Supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

Directions are to take two capsules before the two heaviest meals of the day. A bottle of 120 capsules of Optimized Irvingia with Phase 3™ Calorie Control Complex retails for $64. If a member buys four bottles, the price is reduced to $45 per bottle.

InSea™ is a trademark of Innovactiv, Inc. Integra-Lean® Irvingia is protected by U.S. Patent No. 7,537,790. Other patents pending. Phase 2™ and Phase 3™ are used under license.

Caution: This product is designed to target several critical factors involved in age-related weight gain. Those who ingest more calories than what their body has the metabolic capacity to utilize will not see results. This is because some people are ingesting so many excess calories that no matter how much their metabolic rate is increased, or how much improvement occurs in their post-meal blood sugar and serum triglyceride levels, or how much youthful insulin sensitivity and other body fat-regulating systems are restored, they are overwhelming the metabolic capacity to utilize these calories. This will result in excess calories being stored in adipocytes. One cannot consume limitless calories and expect to shed fat pounds by taking drugs, nutrients, and/or hormones that demonstrate weight-loss effects in clinical studies.

References:
5. Lipids Health Dis. 2009 Mar 2;8.

Contains soybeans, tree nuts, yeast, and corn.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Each day, our bodies are exposed to environmental toxins. Over time, these toxins can overwhelm the body’s natural detoxification systems, causing dangerous alterations in genes that regulate cellular proliferation.*

Fortunately, medical science has documented the ability of certain nutrients to exert powerful health-promoting effects that can significantly bolster the body’s natural defenses against chemical assault.* DNA Protection Formula provides standardized potencies of curcumin, chlorophyllin, wasabi, and broccoli extract.

The formula’s turmeric extract contains bioactive curcumin that guards against food-borne and metabolic toxins, helps to maintain healthy liver function, and provides antioxidant protection against cell injury by inhibiting the formation of free radicals and quenching already formed superoxide and hydroxyl radicals.*

Chlorophyllin contained in the formula binds and forms irreversible complexes with certain toxic chemicals, allowing the body to safely eliminate these compounds before they can enter the bloodstream.

DNA Protection Formula contains the world’s purest, organically grown New Zealand wasabi rhizome, a rich source of long-chain methyl isothiocyanates that have been shown to help maintain healthy liver enzymes.

DNA Protection Formula’s standardized broccoli extract contains concentrated levels of glucosinolate and sulforaphane, two bioactive compounds providing the isothiocyanates that are recommended for good health.*

The suggested dosage is one capsule with each heavy meal. A 60-capsule bottle of DNA Protection Formula retails for $28. If a Life Extension member orders four bottles, the price is reduced to just $18.90 per bottle.

CAUTION: Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Individuals with in-born errors of copper metabolism (e.g., Wilson’s disease) should avoid daily, chronic use of this product. Contains rice.

* These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Achieve Multiple Health Benefits From Highly Absorbable Curcumin

Curcumin and other *turmeric* constituents are impressing scientists around the world with their remarkable health benefits, such as suppressing inflammatory factors, fighting free radicals, and promoting healthy DNA function. The problem is that curcumin is *poorly* absorbed into the bloodstream.

Super Bio-Curcumin® has been shown to *absorb up to seven times better* than conventional curcumin. This patent-pending formula thus represents the most cost-effective way to supplement with this critical nutrient.1,2

The remarkable absorption studies charted to the left reveal that just one 400 mg capsule a day of this turmeric compound can provide curcumin blood levels equivalent to ingesting 2,500–2,800 mg of commercial curcumin supplements.

Not only does this novel turmeric formulation provide far greater *peak* blood levels, but the curcumin also remains in the bloodstream almost *twice as long* compared with conventional supplements.

What's more, this enhanced absorption delivery complex provides other beneficial turmeric compounds in addition to standardized curcumin.

Life Extension®’s Super Bio-Curcumin® contains the patent-pending BCM-95® turmeric compound. A bottle containing 60 Super Bio-Curcumin® with BCM-95® capsules retails for $30. If a member buys four bottles, the price is reduced to just $19.88 per bottle. Each bottle will last most members two months.

References:

To order Super Bio-Curcumin® with BCM-95®, call 1-800-544-4440 or visit www.LifeExtension.com

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How Much Curcumin Are You Absorbing?

**Chart 1.** Super Bio-Curcumin® (BCM-95®) showed 6.9 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with conventional curcumin (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).

**Chart 2.** Super Bio-Curcumin® (BCM-95®) showed 6.3 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with plant-bound curcumin with piperine (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).

**Chart 3.** Bioavailability in rats fed with BCM-95® is 7.8 times higher than conventional curcumin.
Omega-3 Fatty Acids Increase Brain Volume
While Reversing Many Aspects of Neurologic Aging

The cardioprotective power of omega-3 fatty acids has been thoroughly documented in clinical literature. Less well known is their paramount role in optimizing many facets of brain function, from depression, cognition, and memory to mental health.

Recent research has opened up a new horizon in our understanding of omega-3s’ profound ability to halt age-related decline and pathology, shattering the long-held medical belief that brain shrinkage and nerve cell death is progressive and irreversible. Omega-3s have been shown to possess antidepressant and neuroprotective properties. One recent landmark study found that aging humans who consumed more omega-3s had increased gray matter brain volume and that most new tissue development was observed in the part of the brain associated with happiness.1

Similar findings appeared in the prestigious journal Lancet.2 In one of the largest studies of its kind, scientists analyzing the diets of 12,000 pregnant women found that children of those who consumed the least omega-3 were 48% more likely to score in the lowest quartile on IQ tests.

In this article, the latest research on these essential fatty acids’ importance to the growth, development, and function of the human brain is detailed. You will learn about their intrinsic power to preserve cognition and memory and reverse age-related loss of brain function. You will also discover exciting findings on their unique capacity to combat multiple forms of mental illness, neuropsychiatric disorders, and aberrant behavior, from Alzheimer’s disease and aggression to bipolar disorder and depression. > >
OMEGA-3 FATTY ACIDS INCREASE BRAIN VOLUME

These findings have led scientists to suspect a role for omega-3 deterioration in development of typical age-related cognitive decline such as that seen in Alzheimer’s and chronic disease. These are manifested especially in the area of attention, increasing the risk for attention-deficit/hyperactivity disorder (ADHD) and other behavioral disturbances. Later in life, declining levels of DHA and EPA may contribute to development of aggression, anxiety, depression, schizophrenia, dementia, and a variety of other mental health and even criminal conditions.

Scientists are having great success at reversing many of the fundamental age-related decreases in brain function correlated with omega-3 deficiency. ADHD and related conditions can be prevented or mitigated by supplementing infants and nursing mothers with DHA. Young rats supplemented with DHA show increased plasticity, or flexibility of function, in their developing brain cells, with highly invigorated development of synapses, the electrochemical junctions where nerve signals are relayed. In aged rats, omega-3 supplementation reverses age-related...
neuronal changes and maintains learning and memory performance that arise from powerful antioxidant and anti-inflammatory effects.9

A remarkable animal study has just revealed that omega-3 fatty acids halt the age-related loss of brain cell receptors vital to memory production, and show potential for increasing neuronal growth.19

A Natural Crime Fighter?

Recent findings suggest that some criminal and aggressive behaviors are closely correlated with low serum omega-3 levels, which are linked to lower levels of altruism, honesty, and self-discipline.13 These effects may be related to alterations in serotonin turnover, which controls impulsivity and aggression-hostility behaviors.13

There’s solid data indicating that optimal omega-3 intake at all ages is a promising avenue for subduing aggression and hostility.20,21 For example, 1.5 grams of omega-3 supplementation (containing 840 mg EPA and 700 mg of DHA) in autistic children with severe tantrums, aggression, or self-injurious behavior produced significant improvements compared with placebo, without adverse effects.22 And stressed but otherwise healthy volunteers given 1,500 mg/day of DHA reported a significantly improved rate of stress reduction compared to a no-treatment group, suggesting an adaptogenic role for omega-3s (adaptogens help the body respond to imposed stress in a variety of ways).23

In a group of substance abusers, supplementation with 2,225 mg EPA and 500 mg DHA for 3 months produced significant decreases in anger and anxiety scores compared to placebo recipients.16 Amazingly, the two nutrients complemented each other, with EPA increases being most robustly associated with lowered anxiety scores, and DHA increases with lowered anger scores. Similarly, in young adult prison inmates, multi-supplements featuring omega-3s produced significant reductions in antisocial, violent, aggressive, and transgressive (rule-breaking) behavior.24,25

More Potent than Prozac®

Large epidemiological studies repeatedly demonstrate that depressed people have significantly reduced levels of DHA and EPA in red blood cell membranes or serum.26,27 One autopsy study revealed lower amount of omega-3s in the brains of those who’d suffered depression compared to those who did not.28 Low omega-3 status is frequently found in people who have attempted or committed suicide.29-31 In fact, seasonal variations in blood levels of omega-3s have been

Reverse Brain Aging

- Lipids comprise a significant portion of the brain. Of these lipids, omega-3 fatty acids are particularly important.
- Omega-3 fatty acids exert profound anti-aging effects on brain structure and function, from cognition and memory to mental health and Alzheimer’s prevention.
- They have recently been associated with increased volume of the brain’s gray matter, especially in those regions associated with happiness, and they boost intelligence through enhanced function from birth onwards.
- They support brain cell structure, increase the production of vital neurotransmitters, and blunt oxidative and inflammatory damage.
- Ranges of 1,000-3,000 mg of EPA and 1,000-1,500 mg of DHA have been shown to yield significant improvements in symptoms of depression, aggression, and other mental disorders, as well as protection against early cognitive decline and even early Alzheimer’s disease.
shown to closely parallel similar variations in violent suicide deaths. Patients with deficient omega-3 status also had reduced expression of the vital transporter complex responsible for moving serotonin at nerve cell junctions. In fact, the serotonin-related benefits of omega-3 supplementation are powerful enough to stand up to a head-to-head comparison with fluoxetine (Prozac®), a common and highly effective member of the selective serotonin reuptake inhibitor (SSRI) category of modern antidepressants. In that study, 50% of subjects responded well to fluoxetine alone, 56% to EPA supplementation (1,000 mg), and an impressive 81% in people who took both forms of treatment. At doses above 2,000 mg, results are uniformly dramatic. Double-blind, placebo-controlled trials are revealing substantial superiority of omega-3 therapy to placebo, using standard depression assessment scales. Numerous other studies are further validating these dramatic effects on depression in a host of other contexts: depressive symptoms were alleviated in patients with Parkinson's disease, and in pregnant women with major depressive disorder, and in middle-aged women experiencing psychological distress and depressive symptoms during the menopausal transition. A particularly powerful effect was shown in middle-aged women experiencing psychological distress and depressive symptoms during the menopausal transition. In one Israeli study, omega-3 supplementation in children with major depression provided significant improvement across all indices of measurement. A Novel Intervention for Bipolar Disorder

Bipolar disorder, formerly known as manic-depression, continues to be a perplexing condition for psychiatrists. In bipolar disorder, patients may “cycle” between periods of profound depression and periods of elation and excessive activity (mania). But some cycle rapidly, and others more slowly, while some patients who meet criteria for the conditions have little or no manic component at all.

As with depression, cell membrane deficiencies in omega-3s are associated with bipolar disorder, and people with higher seafood intakes appear to be relatively protected against bipolar symptoms. An autopsy study of the brains of people with bipolar disorder revealed significant deficits in DHA content of brain cell membranes, with concomitant elevations of inflammatory products that would have been suppressed by normal levels of omega-3s.

Omega-3 fatty acids are showing encouraging results in treating some patients with bipolar disorder. In one study, patients supplemented with 9,600 mg omega-3 fatty acids daily showed significantly longer periods of remission than did placebo recipients, and the treatment was well-tolerated. A study using MRI scanning revealed profoundly favorable cell membrane alterations in brain tissue induced by very high dose omega-3 supplementation (approximately 9,700 mg daily). In general omega-3s appear
to be more successful at managing the depressive phases of bipolar disorder than the manic phases, a feature they share with many prescription medications. Several small studies demonstrated that supplementation could also reduce the frequency of manic episodes. One dramatic example is a 2009 study of children with bipolar disorder, in which both manic and depressive symptoms were significantly mitigated by combined DHA (1,560 mg daily) and EPA (360 mg daily) supplementation for 6 weeks, according to clinician ratings as well as parent ratings.

Most studies showing the greatest effectiveness in bipolar disorder involve combinations of DHA and EPA. And as we saw with depression, higher daily doses, on the order of 1,000-1,500 mg of DHA and up to 2,000-3,000 mg of EPA, are optimal for bipolar management.

Cognitive Decline and Alzheimer’s Disease

Omega-3 intake is strongly associated with many different measures of cognition and memory in numerous epidemiological studies, and there’s compelling evidence for potent neuroprotection over long time periods. Insufficient omega-3 intake is strongly correlated with diminished adaptability of brain synapses and impaired learning and memory. People with lower omega-3 levels may be more likely to suffer from a host of cognitive impairments including dyslexia, ADHD, and cognitive decline.

Laboratory and animal studies shed light on these observations, suggesting that omega-3 treatment and supplementation may enhance brain function through increased production of the membrane-rich neurites required for new synapse formation. Other protective and cognition-enhancing effects include improved neuronal cell membrane characteristics resulting in enhanced neurotransmission, increased synaptic release of vital neurotransmitters such as serotonin, and neuroprotection from inflammation and oxidant-related damage including those induced by antipsychotic medications. DHA is also protective against several risk factors for dementia including head trauma, diabetes, and cardiovascular disease.

In healthy adults, increased omega-3 intake is positively associated with greater brain volume in regions associated with emotional arousal and regulation of behavior. People who get more omega-3s have bigger, more functional brains. A 2009 study found that omega-3-supplemented adults made fewer risk-averse decisions, but did not show increased impulsiveness.
OMEGA-3 FATTY ACIDS INCREASE BRAIN VOLUME

In other words, the omega-3 group appeared better able to take appropriate risks in problem-solving, without dangerous impulsivity—skills that are especially relevant in people with depression, who often withdraw and become fearful of even everyday risk taking.

Alzheimer’s disease remains one of the most intransigent of age-related neuropathologies. Oxidative damage and inflammation underlie the progressive loss of memory and disorientation that typify the disease, resulting in the term “inflammaging” to describe the complex events that lead to clinically important symptoms. Omega-3s have been shown to favorably alter some of the characteristic changes associated with the disease.

DHA (1,700 mg daily combined with 600 mg EPA) in Alzheimer’s patients significantly reduced levels of inflammatory cytokines circulating in their blood, suggesting that some of the brain tissue inflammation might be mitigated. Omega-3 supplementation, again with 1,700 mg DHA and 600 mg EPA, in Alzheimer’s patients with mild-to-moderate disease improved appetite and produced significant beneficial increases in body weight after 6 and 12 months of treatment, while placebo patients showed no change in weight. These findings have led to calls by experts for increased use of omega-3s as a preventive strategy—calls made all the more urgent by the observation that supplementation is most effective in slowing or reversing mild Alzheimer’s disease and early age-related cognitive decline.

The molecular basis for this early intervention strategy lies in the cellular pathology at the core of Alzheimer’s: omega-3 treatment of cultured brain cells suppresses many of the early signs of damage triggered by the inflammatory Alzheimer’s protein known as beta-amyloid. And animal studies suggest that oral supplementation with DHA may enhance the formation of new synapses and their vital dendritic spines, all of which can improve cognitive function. In fact, learning and memory in animal models of Alzheimer’s are improved by DHA supplementation, and in humans fewer learning errors were made by people with age-related cognitive decline after six months on DHA (900 mg daily).

**Summary**

An estimated 8% of brain matter is composed of omega-3s. Omega-3 fatty acids exert profound anti-aging effects on brain structure and function, from cognition and memory to mental health and Alzheimer’s prevention. They have recently been associated with increased volume of the brain’s gray matter, especially in those regions associated with happiness, and they also boost intelligence through...
enhanced function from birth onwards. They support brain cell structure, increase the production of vital neurotransmitters and blunt oxidative and inflammatory damage. Ranges of 1,000-3,000 mg of EPA and 1,000-1,500 mg of DHA have been shown to yield significant improvements in symptoms of depression, aggression, and other mental disorders, as well as protection against early cognitive decline and even early Alzheimer’s disease.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

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Life Extension Mix™
Tablets, Capsules, or Powder…Your Choice!

Consumers take dietary supplements to obtain concentrated doses of some of the beneficial nutrients found in fruits and vegetables. Commercial multivitamins, however, do not provide all the vital plant components that scientists have found are needed to maintain good health.

Life Extension Mix™ is formulated based on findings showing that consuming lots of fruits and vegetables dramatically lowers the risk of health problems. Life Extension Mix™ provides concentrations of the fruit and vegetable extracts that researchers have found protect against a wide variety of cellular insults.

Life Extension Mix™ is available in tablet, capsule, and powder forms, with or without copper, and with or without extra niacin. To view the comprehensive Life Extension Mix™ formula log on to www.LifeExtension.com/MixBreakdown

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**To order your supply of LIFE EXTENSION MIX™,**
call 1-800-544-4440 or visit www.LifeExtension.com

Contains fish (tilapia), soybeans, tree nuts (cocoa beans), yeast, corn, and sesame.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
An abundance of scientific research substantiates the wide-ranging health benefits, including promoting a healthy heart, of omega-3 fatty acids in fish oil and monounsaturated fatty acids-polyphenols in olive fruit.1-9

SUPER OMEGA-3 from Life Extension® uses a patented EPA/DHA extraction process that results in a pure, stable and easy-to-tolerate fish oil extract.

While most fish oil is distilled to decrease contaminants such as mercury and PCBs, the Pure™ fish oil used in Super Omega-3 is produced with a patented method that purifies the oil with a highly advanced distillation process to reduce pollutants to virtually undetectable levels. The result is an improved fish oil that exceeds the standards set by international rating agencies.

Sesame Lignans Enhance Fish Oil’s In Vivo Effects

The unstable nature of fatty acids like fish oil limits their biological efficacy in the body. Scientific studies show that when sesame lignans are supplemented with fish oil, the beneficial effects are augmented.10

Sesame lignans help guard against lipid peroxidation, thereby extending the stability of DHA in the body. These lignans also direct fatty acids toward pathways which can help with inflammatory reactions. Super Omega-3 provides standardized sesame lignans to enhance the overall benefits of the improved EPA/DHA fish oil blend.

Higher Potency Standardized Olive Fruit

To emulate a Mediterranean diet, Super Omega-3 provides a standardized olive fruit extract to deliver the polyphenol hydroxytyrosol, a powerful antioxidant that protects normal LDL from oxidation and counters dangerous free radicals.11-14 Research shows that a combination of olive oil and fish oil supplements helps with inflammation better than a placebo or fish oil alone.15 Therefore, Super Omega-3 provides the equivalent polyphenol content of 6 ounces of Extra Virgin Olive Oil.

Super Omega-3 provides a high concentration of olive fruit extract standardized for hydroxytyrosol, tyrosol and oleuropein polyphenols. Research shows the value of oleuropein in favorably altering gene expression, delaying senescence in specialized skin cells, and helping maintain normal platelet activation.

Life Extension’s Super Omega-3 is a fish oil concentrate that contains a full-spectrum blend of synergistic nutrients, providing a product of the utmost quality to produce optimal effects.

Super Omega-3 is certified to contain no detectable levels of mercury, arsenic, lead, cadmium, and other toxic metals by the International Fish Oil Standards (IFOS™). This product meets or exceeds IFOS™ standards for PCBs, dioxins, and other contaminants, and thus has received its highest 5-star rating.

If you have any specific questions about this supplement, please call 1-800-336-6388.

References:

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Two softgels should be taken twice daily with meals. A bottle of 120 softgels of SUPER OMEGA-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $32. If a member buys four bottles, the price is reduced to $21 per bottle. If 10 bottles are purchased, the price per bottle is reduced to only $18.68. Item# 01482

For those with a sensitive stomach, Super Omega-3 is now also available with enteric coating and retails for $34. If a member buys four bottles, the price is reduced to $23.25 per bottle. If 10 bottles are purchased, the price per bottle is reduced to only $21. Item# 01484

To order the most advanced fish oil supplement, Super Omega-3 EPA/DHA with Sesame Lignans and MORE Olive Fruit Extract with or without enteric coating call 1-800-544-4440 or visit www.LifeExtension.com

Supportive but not conclusive evidence shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Contains fish (anchovy, sardine, mackerel), soybeans, and sesame.
PROTECT YOUR DNA from CT Scans and X-rays
Research Supports Nutrient Shields Against Ionizing Radiation

In hospitals and doctors’ offices around the country, millions of innocent patients are unknowingly exposed to excessive radiation. The main culprit is the computed tomography (CT) scan which exposes patients to the equivalent amount of radiation received by atomic bomb survivors in the low-dose range.¹

Published scientific studies document that these excessive amounts of radiation will result in catastrophic numbers of new cancers due to DNA mutation.¹⁻³ Epidemiologists estimate that as many as 29,000 new cancers could be related to CT scans performed in the US in 2007 alone.² There are now approximately 70 million CT scans performed every year, up from a mere 3 million in 1980.⁴⁻⁵

As if this were not bad enough, shocking revelations in the New York Times and scientific publications last year exposed frightening inattention to the risks of X-ray equipment, specifically computed tomography (CT) scanners.⁶⁻⁸ In one case, more than 200 older adults received up to 8 times the normal radiation dose during brain scans.⁶ In another, a 2-year-old boy was left with visible skin changes and a significant probability of cataracts within a few years, following lengthy over-exposure.⁶

While CT scans provide important diagnostic information that can save lives, their growing frequency is putting an enormous population at risk for a range of lethal cancers. Most likely everyone reading this article will have one or more CT scans in the coming years. Fortunately, new research shows that a number of readily available antioxidant nutrients and herbs can offer levels of protection against the dangers of ionizing radiation found in X-rays and CT scans.

What follows is an analysis of recent studies showing how certain remarkable nutrients can ward off many dangers associated with medical-based diagnostic radiation exposure. > >
Antioxidant Protect Against Radiation

Ionizing radiation (principally X-rays and gamma rays), when it interacts with living tissue, releases massive amounts of reactive oxygen and nitrogen species.9 The pathological result is free radical damage to vulnerable DNA strands.10 When DNA genes that regulate cellular proliferation are damaged, the result can be cancer formation.

By interrupting oxidant processes, one can reduce the risk of radiation-induced cancers.11,12 Overlooked by most physicians and radiologists is the role of nutritional supplements in providing impressive protection from ionizing radiation.11,13

If your physician orders a CT scan, X-ray, or other diagnostic procedure involving radiation, optimize your dosing of antioxidant supplements as soon as you are scheduled. There are several classes of nutrients that have been studied for their radioprotective capabilities. In this article we will examine vitamins, trace minerals, polyphenols, and various plant extracts as a way to shield yourself from the dangers of medical radiation diagnostics.

Polyphenols

Polyphenols are versatile molecules found in plant products. Research has shown that they provide a multitude of key protective benefits, including modifying gene expression that protects tissues from ionizing radiation. Collectively, polyphenols offer important protection from some of radiation’s impact on the body.14,15

Resveratrol, quercetin, and green tea polyphenols rank among the best-studied and most potent radio-protectants in this class. Resveratrol is both radioprotective in healthy tissue and also has antitumor activity.16-18 Resveratrol protects mouse chromosomes from radiation-induced damage.19 Its antioxidant properties prevent radiation toxicity to the liver and small intestines, two tissues most immediately sensitive to radiation’s ill effects.20

Quercetin and its related compounds protect lipids and proteins from otherwise-lethal doses of gamma radiation, again largely through their antioxidant properties.21 Quercetin and other polyphenols not only provide chromosomal radioprotection, but also shield mitochondrial DNA from radiation-induced oxidant damage.22 Quercetin also ameliorates biochemical changes in human white blood cells following radiation exposure.23

The polyphenol epigallocatechin gallate (EGCG) derived from green tea also protects animals from whole-body radiation, blocking lipid oxidation and prolonging life span.24 Green tea extracts can protect rapidly-reproducing cells in the intestine and hair follicles from the damaging effects of radiation therapy, a form of radiation exposure far more intense than typical CT doses.25,26

Soy Components

Soybeans contain a wealth of health-promoting substances, several of which have remarkable radioprotective effects. Genistein, an isoflavone, can protect mice from ionizing radiation injury after a single
dose. One mechanism is its protection against radiation-induced lipid peroxidation which disrupts cell membranes and structures. Genistein also stimulates production of red and white blood cells following whole-body radiation, again after as little as a single dose. That's vital, because rapidly-reproducing blood stem cells in bone marrow are among the most vulnerable to radiation's killing effects. Because of its powerful induction of cytokines that stimulate new blood cell formation, genistein is under intensive study as a way to protect military and civilian personnel against a potential nuclear threat.

Soybeans also contain a radioprotective enzyme inhibitor known as the Bowman-Birk Inhibitor (BBI). BBI activates genes involved in DNA repair, making it among the most valuable compounds for late (or even post-exposure) treatment of radiation toxicity. In typical multitargeted fashion, BBI also stabilizes enzymes that would otherwise produce radiation-induced arrest of skin cell growth. Remarkably, BBI enhances survival of healthy cells, but not diseased cells, following radiation exposure. BBI survives processing in commercial soybean products (e.g., soy milk, soybean concentrate, and soy protein isolates), making it a highly accessible radioprotectant.

**Herb, Spice, and Other Plant Extracts**

Compelling scientific evidence suggests that plant extracts have valuable gene expression-modifying effects that are relevant in protecting our bodies from radiation exposure.

Curcumin, from turmeric and other south Asian spices, has powerful radioprotective effects as a result of its antioxidant-modifying and gene expression-modifying characteristics. Curcumin supplements reduce DNA damage and tumor formation in rats; they reduce both DNA damage and lipid peroxidation in cultured human white blood cells. Curcumin has “dual action.” Its antioxidant effects protect normal tissue from radiation. But it also upregulates genes responsible for cell death in cancers, enhancing tumor destruction by radiation. The result is increased survival in animals exposed to high-dose radiation.

Together, garlic and ginger offer surprising radioprotection. Garlic's high sulfur content supports natural antioxidant systems like glutathione. Garlic extracts protect red blood cells from radiation damage by a glutathione-related mechanism. In mice, garlic extracts prevented radiation damage to chromosomes in vulnerable bone marrow cells. By a different mechanism (think multitargeting), garlic extracts downregulate X-ray-mediated increases in the inflammatory NF-kappaB system. Ginger extracts boost

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**CT Scans and X-rays**

- Radiation exposure from CT scans is vastly higher and more dangerous than most people realize.
- As many as 29,000 cancers are caused each year as a result of CT and other radiology scans.
- Radiation kills by producing oxygen free radicals that damage DNA and other structures.
- A wide variety of common antioxidant nutrients can offer substantial protection against the risks of radiation-induced cancer and other health threats.
- Never undergo a radiology study without understanding if it's truly necessary—if it is, then follow suggestions in this article for optimizing your radioprotection.
glutathione activity and reduce lipid peroxidation by a separate and complementary mechanism. The extracts directly scavenge a host of free oxygen and nitrogen radicals immediately following their formation by radiation.

Ginkgo biloba reduces “clastogenic” factors—DNA damage artifacts in the blood of people and animals exposed to radiation. Astonishingly, this effect is so powerful that it proved useful in treating workers at the Chernobyl nuclear plant long after their exposure. More recently, ginkgo extracts proved to protect animals’ organs from direct radiation-induced damage, and humans from cell damage following radioactive iodine treatment.

Ginseng is another plant important in traditional medicine that has remarkable radioprotective effects. A variety of ginseng extracts protect against radiation-induced DNA damage. It protects hair follicles and other rapidly-reproducing (but healthy) tissues from damage by radiation. Its antioxidant effects have resulted in protection of a variety of radiation-sensitive tissues, including cells in the bone marrow, spleen, and testicles. Ginseng’s immunomodulatory effects make it especially useful in defending the body against the ravages of radiation injury.

A North American ginseng extract was recently found to protect human white blood cells from DNA damage even up to 90 minutes following radiation exposure. That makes it of great interest to defense and national security researchers.

Silymarin, a milk thistle extract, is well known to protect liver cells from chemical toxins. Not surprisingly, then, silymarin has been found to protect liver tissue from radiation damage as well. It reduces DNA damage and extends survival in animals exposed to dangerous levels of radiation. Silymarin’s free radical scavenging and direct antioxidant effects are credited with producing these results.

N-Acetyl Cysteine (NAC)

N-acetyl cysteine (NAC) is a sulfur-containing compound that powerfully supports natural intracellular antioxidant systems, particularly glutathione. That makes it an effective radioprotective agent. NAC attenuates liver damage from radiation in mice, reducing oxidant damage and resultant DNA damage—both before and even after radiation exposure. By a separate mechanism (multitargeting again), NAC stimulates release of cytokines known to protect bone marrow against radiation injury. And NAC protects bone marrow cells from radiation as well, largely by preventing DNA damage. A multi-supplement mixture including vitamins C and E plus NAC significantly increased 30-day survival of mice exposed to a potentially lethal dose of X-rays. Remarkably, the effect was the same whether the supplement was given before or after the exposure.

S-adenosylmethionine (SAMe)

S-adenosylmethionine (SAMe) is a powerful methyl group donor that’s essential for keeping up cellular levels of the vital antioxidant glutathione. Enzymes vital for DNA repair (and hence cancer protection) can’t function properly in the absence of methyl donors such as SAMe. In early 2010 we learned that ionizing radiation actually suppresses SAMe levels in animal models. Increasing the animals’ SAMe levels, on the other hand, minimized DNA damage from ionizing radiation.

S-adenosylmethionine (SAMe) is a powerful methyl group donor that’s essential for keeping up cellular levels of the vital antioxidant glutathione. Enzymes vital for DNA repair (and hence cancer protection) can’t function properly in the absence of methyl donors such as SAMe. In early 2010 we learned that ionizing radiation actually suppresses SAMe levels in animal models.

Vitamins and Trace Minerals

The “ACE” vitamins (A, C, and E) offer proven antioxidant protection as a result of their molecular structures. High intakes of these vitamins and other antioxidants protect airline pilots from radiation-induced chromosomal damage, an occupational hazard in those who work at high altitudes. In fact, ACE
supplements have been proposed as “space foods” to protect astronauts from high radiation levels.84

Beta-carotene, the precursor of vitamin A was first used clinically in the wake of the Chernobyl nuclear accident in treatment of children from the region. Supplementation reduced the amount of radiation-induced oxidized lipids.85 More controlled animal studies showed that vitamin A could reverse radiation-induced gene expression abnormalities that could lead to cancer.86-88 Other studies show that vitamin A ameliorates other radiation effects and enhances death of cancerous cells.89 Still other studies reveal that vitamin A can actually prevent radiation-induced death of healthy cells.90

Vitamin C, together with natural antioxidant systems such as glutathione, helps protect DNA and chromosomes from oxidative damage.91-93 Vitamin C also inhibits radiation-induced death of human blood cells.94 Remarkably, vitamin C can counteract radiation-induced “long-lived radicals” (LLRs) that destabilize chromosomes and induce cancerous mutations.95 The ability to counter both classical radicals and LLRs may be vital in preventing genetic damage from radiation.95

Like vitamin C, vitamin E stabilizes free radicals once they form, reducing their toxicity, an effect vital in radioprotection.7 Importantly, vitamin E enhances the growth-inhibiting effect of radiation on cancer tissue while simultaneously protecting normal cells.96 Animal studies show that vitamin E significantly protects mice from dying after exposure to otherwise lethal levels of gamma rays.97 Intriguingly, this effect is the result of modulation of cytokines; it is accompanied by valuable increases in new blood cell formation suppressed by radiation.97,98

A remarkable study among X-ray technicians reveals just how powerful antioxidant vitamins can be. Radiology techs are nominally protected by elaborate shielding, but they’re still exposed to unnaturally high levels of radiation over the course of a lifetime. As a result they tend to have higher levels of tissue oxidation. But when a group of techs was supplemented with vitamins C (500 mg) and E (150 mg) daily for 15 weeks, their markers of tissue oxidation plummeted, and their levels of natural antioxidants (such as glutathione in red blood cells) rose significantly.99

Trace Minerals

Our endogenous antioxidant systems such as superoxide dismutase, catalase, and glutathione peroxidase all depend on trace minerals as cofactors for their function. That makes those minerals, especially...
Other Potent Radioprotective Nutrients

As we’ve noted, most nutrients with powerful antioxidant activity can be expected to help protect us against radiation exposure from CT scans. In addition to those we’ve discussed, there’s good evidence for radioprotection by spirulina extracts, which protect bone marrow cells from DNA damage. Melatonin also protects dividing cells and circulating blood cells from chromosomal injury by radiation. The Indian gooseberry (Emblica officinalis) increases survival time and reduces mortality of mice exposed to whole-body radiation. Effects include protection against lipid peroxidation and protection of rapidly-dividing cells in the intestine. Carnosic acid and other rosemary extracts protect against DNA damage through their antioxidant activity, both before and after radiation exposure.

Summary and Suggestions

Radiation from “routine” diagnostic studies, especially CT scans, poses a substantial and largely unrecognized threat to our health. But radiation damage primarily stems from free radical formation. That means we can protect ourselves powerfully with antioxidant nutrients. Naturally, you should already be using a comprehensive antioxidant regimen for health maintenance. But should you find yourself (or a loved one) in line for a CT scan, X-ray, or other high-radiation procedures, consider the following suggestions as soon as you learn you’ll undergo the test:

- Choose an excellent, high-potency supplement containing polyphenols such as resveratrol and quercetin.
- Include a green tea supplement high in EGCG at the top of the recommended dose range.
- Take a soy supplement rich in genistein. To ensure that you are getting adequate amounts of protective BBI protein, add several cups of soy-milk to your daily intake prior to the test.
- Consider at least curcumin, ginseng, and ginkgo extracts prior to the test, at the upper end of the recommended doses.
- Adding a daily dose of NAC (total 1,800 mg) is likely to be very helpful.
- Consider utilizing SAMe (1,200 mg) to optimize DNA protection.
Optimize your doses of antioxidant vitamins A, C, and E. Use the upper end of Life Extension’s recommended doses. Remember that prolonged high-dose vitamin A can be dangerous, so be sure to check with your physician.

Begin a good oral zinc supplement if you aren’t already using one.

ALWAYS be sure to maximize your hydration prior to a radiation study, especially when taking sulfur-containing supplements such as NAC.

Minimize your exposure to other oxidant-inducing stresses such as tobacco smoke and alcohol. Immediately refrain from either as soon as you learn you’ll undergo the study.

No one wants to take unnecessary risks with their health—ask your doctor if a planned test is truly the only way to get desired diagnostic information. But these steps can offer significant protection in the event that such a study is truly unavoidable.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

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A huge percentage of men over age 50 suffer from prostate-induced discomforts.

Ultra Natural Prostate Formula contains the most scientifically substantiated nutrients to help protect the prostate gland and maintain its healthy function.

Included in the formula is a standardized European pumpkin seed oil extract rich in delta-7 sterols and fatty acids to support a healthy prostate. A supercritical CO₂ extraction technology supplies optimal amounts of these key phytonutrients to complement the fatty acid composition of saw palmetto. It is sourced from a unique variety of pumpkin cultivated specifically to yield higher ratios of these compounds than pumpkins grown for commercial use.

The nine additional active ingredients in Ultra Natural Prostate Formula are:

• Saw palmetto extract. A number of normal biological events in aging men affect the prostate gland. Saw palmetto has been shown to interfere with DHT activity in the prostate, inhibit alpha-adrenergic receptor activity (to support normal urinary flow), and help control inflammatory actions in the prostate gland. A novel DeepExtract™ extraction technology ensures the most desirable and complete profile of saw palmetto available.

• HMRLignan™ Norway spruce and ActiFlax™ flax lignan extracts. Standardized lignans from Norway spruce and flax seeds convert to enterolactone that is then absorbed into the bloodstream where it provides significant biological effects. Enterolactone has demonstrated anti-estrogen and anti-DHT effects that are of particular importance for the aging prostate gland.

• 5-LOXIN® boswellia extract. Published studies show that normal aging and poor diet cause levels of a dangerous enzyme (5-lipoxygenase) to increase, which can affect prostate cells. 5-LOXIN® is a patented extract from the boswellia plant that has been shown to suppress 5-lipoxygenase in addition to other pro-inflammatory factors.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
• **Nettle root extract** (*Urtica dioica*). Testosterone converts to estrogen at higher rates as men age. Prostate cells are sensitive to estrogen’s growth stimulatory effects. Nettle root helps support prostate cells against excess estrogen levels.¹¹

• **Pygeum**. Normal aging results in levels of certain prostaglandins increasing in the prostate gland. *Pygeum africanum* extract helps suppress these prostaglandins, keeping the prostate gland placid and promoting prostate comfort.¹²

• **Beta-sitosterol**. The most biologically active constituent of pygeum is beta-sitosterol. Beta-sitosterol from other plant sources is also included in this prostate support formula.¹³

• **Cernitin®**. This European pollen extract has been shown to relax smooth muscle tone of the urethra, counteract DHT, and help regulate inflammatory reactions.¹⁴⁻¹⁷

• **Boron**. In addition to helping protect bones, this mineral has been shown to slow elevation of prostate-specific antigen (PSA)—a benefit seeming to occur as a result of boron’s positive effect on the presence of protein-degrading enzymes in the prostate gland.¹⁸,¹⁹

• **Lycopene**. This carotenoid, associated with the tomato’s red color, helps maintain healthy DNA gene function in prostate cells.²⁰⁻²⁴

The daily dose of two softgels of **Ultra Natural Prostate Formula** provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>USPlus® Saw Palmetto (<strong>C0 DeepExtract™</strong>)</td>
<td>320 mg</td>
</tr>
<tr>
<td>Cernitin®</td>
<td>252 mg</td>
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<tr>
<td>5-LOXIN®</td>
<td>70 mg</td>
</tr>
<tr>
<td>Pumpkin seed oil (<strong>Cucurbita pepo</strong> extract) (standardized to 85% total fatty acids)</td>
<td>200 mg</td>
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<tr>
<td>Stinging nettle root extract (<strong>Urtica dioica</strong>)</td>
<td>240 mg</td>
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<tr>
<td>Pygeum extract</td>
<td>100 mg</td>
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<tr>
<td>Lycopene</td>
<td>10 mg</td>
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<tr>
<td>Phytoesterol complex (<strong>standardized to 26.6% beta-sitosterol</strong>)</td>
<td>678 mg</td>
</tr>
<tr>
<td>HMRLignan™ Proprietary blend of Norway Spruce and ActiFlax™ Flax Lignan extracts</td>
<td>20.15 mg</td>
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<td>Boron</td>
<td>3 mg</td>
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**Ultra Natural Prostate Formula** provides scientifically validated standardized plant extracts that have been shown to promote healthy prostate function. No other prostate protection formula provides such a broad array of nutrients to support the multiple factors involved in maintaining a healthy prostate gland.

Contains soybeans.

The retail price for one bottle **Ultra Natural Prostate Formula** is $38. If a member buys four bottles, the price is reduced to $26.25 per bottle.

**References**


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To order **Ultra Natural Prostate Formula**, call 1-800-544-4440 or visit www.LifeExtension.com
By absorbing blue-light, carotenoids protect delicate photo-receptor cells in the retina’s macula from light damage. The density of your macular pigment (composed of lutein, zeaxanthin, and meso-zeaxanthin) is essential to proper vision. Unfortunately, this density declines naturally over time. Some aging people also lose their ability to convert lutein into meso-zeaxanthin inside their macula.

Eating lots of lutein- and zeaxanthin-containing vegetables can help maintain the structural integrity of their macula. However, since meso-zeaxanthin is not part of the typical diet, it cannot be replaced except in supplement form.

Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin gives you therapeutic doses of all three carotenoids to help protect your precious eyesight plus a special ingredient that’s scientifically proven to help fight tired eyes.

Fight Tired Eyes With Astaxanthin

If you’re one of the more than 72 million people in America who use a computer daily at work, you’re probably familiar with eye fatigue. Staring at a fixed-distance object such as a computer screen for a long period of time can cause the muscles that focus your eyes (called the ciliary body) to tire or go into spasm. This can result in physical symptoms such as head discomfort, sensitivity to glare, tiredness, soreness, dryness, and blurry vision.

Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin contains a potent dose of astaxanthin, a carotenoid found in a red algae called Haematococcus pluvialis. Studies show that taking astaxanthin with other carotenoids protects against free-radical induced DNA damage, repairs UVA-irradiated cells, and inhibits inflammatory cell infiltration. Astaxanthin also helps support vascular health within the eye and improves visual acuity. Its fat-soluble nature offers protection to sensitive cells inside the eye.

With its special combination of ingredients that targets eyestrain and protects visual acuity, Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin is truly an exciting breakthrough in eye care.

The retail price for a bottle containing 60 softgels of Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin is $42. If a member buys four bottles, the price is reduced to just $28.50 per bottle.

To order Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin, call 1-800-544-4440 or visit www.LifeExtension.com

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7. OptiLut® is a registered trademark of NutriScience Innovations, LLC.
8. Lutein Plus® and MZ® are registered trademarks of Quantum Nutritional. Licensed under U.S. Patents 5,523,494; 6,218,436; 6,329,432; and 6,504,067.
9. Contains soybeans.
Sometimes one’s experiences in a chosen career field can alter the trajectory of that career, sending it down a profoundly different path. Something of the sort happened to Dr. Enrique Ginzburg, Professor of Surgery in the Division of Trauma and Surgical Critical Care at the University of Miami’s Miller School of Medicine. Ginzburg says he became deeply interested in the subject of life extension as a direct result of the stresses of his job.

“I deal with death and dying every day,” explains Ginzburg. “We see shootings, accidents, and other severe traumatic injuries. In the intensive care wards we sometimes have 30 patients who are in critical care. It’s a high-pressure, high-acuity work environment.”

Ginzburg says he became intrigued with age management early in his medical career, when the topic first came to world attention through several groundbreaking books in the 1970s and 80s. “It was the first time the medical field introduced to lay people the possibility that we could increase our life span through caloric restriction, low-fat diets, and supplements like free radical scavengers and antioxidants.”
Ginzburg became an early adopter of those ideas. His surgical career progressed meanwhile until finally in his mid-40s, as a direct result of having death and dying as constants in his life, Ginzburg started thinking more seriously about the topic of prolonging life. “I saw an advertisement for an anti-aging conference and attended a lecture given by Daniel Rothenberg, a doctor at the University of California at San Diego, on new uses for human growth hormone.” What impressed him most was that Rothenberg was in academia; Ginzburg was also a professor.

### Expanding Research Across Boundaries

From that first conference, Ginzburg has increased his involvement in regenerative research. “We’re looking at stem cell research, regrowth of cardiac tissue, and cell regeneration using telomerase augmenters.” Telomerase is an enzyme that allows for the replacement of bits of DNA known as telomeres, which are otherwise lost when a cell divides. Ginzburg believes telomerase therapies may be used not only to combat cancer, but also to get around human aging and significantly extend life span.

Moving from trauma surgery to life extension isn’t as big a leap as one might think, especially for Ginzburg, who sees all medicine as branches of the same tree. “The biologic organism is completely interconnected in all aspects of life. What we want to do is help people not just in the acute phase when they require surgery, but also to prevent surgery by optimizing health. And whatever you do crosses over all disciplines of medicine.”

In fact, Ginzburg surmises that recent studies of human growth hormone in post-operative wound healing will one day bear fruit in his own surgical ward: “I can see measuring peoples’ IGF-3 level prior to surgery, and if it’s low, augment it for several weeks to boost the body’s ability to heal, continuing with it post-op.” IGF-3 is one of the newer insulin-like growth factors (or IGFs), peptides released from various cells that have the ability to stimulate cell growth and multiplication.

### Resistance to New Ideas

Like many new ideas, life extension techniques like hormone augmentation have not been met with universal acclaim. Ginzburg points to his own experiences. “When I first showed interest in developing this idea, there was a lot of resistance from the university as well as other physicians,” he recalls. “Some were encouraging, but I met with a considerable amount of obstruction.” But that was several years ago. Times have changed—if slowly. “Today, to my delight, researchers and experts in the field agree about hormone augmentation.”

Use of human growth hormone still meets with some resistance, but Ginzburg believes the tide of acceptance is turning as more successful research comes out. “This is especially true in patients where there is nothing more to offer,” he adds.

He has taken a similar approach to the use of testosterone for intensive care patients on ventilators. “When I’d walk through the ICU, I’d see patients that were emaciated and not thriving. They were chronically ill and they weren’t getting better,” Ginzburg says. “So I talked to the families and told them that supplementing with testosterone was not something used very often, but it might possibly work. We still need to do a large, prospective, randomized trial to prove its effects, but the results have been promising. Supplementing with testosterone gave patients, especially elderly males, some muscle mass to help them breathe better.”

Ginzburg also believes there is an enormous reservoir of valuable alternative medical practices and medicinal products, but most of these still require a significant
amount of research to establish their effectiveness. Ginzburg says he has seen supplementation totally change lives in cases of deficiency. “Once demonstrated that they do work, these can be inserted into daily health regimens,” he states. “For example, CoQ10 has been shown to work as an antioxidant, killing melanoma cells in lab tests and even fighting periodontal disease.”

Coenzyme Q10 is a compound found naturally in cell mitochondria. CoQ10 is involved in the making of the molecule ATP, which serves as the cell’s major energy source and drives a number of biological processes including muscle contraction and the production of protein. “CoQ10 is a perfect example of a product with minimal toxicity that I believe people should be taking as a prophylactic,” Ginzburg says. “And there are a great many others, such as vitamin B6, which has shown promise in reversing atherosclerotic disease.”

In addition, there are the studies on telomerase. “The second generation of telomerase-augmenting products has been shown to increase the size of telomeres. Those results are about to be published. There are also other growth hormones like testosterone that have significant benefits. I think safety concerns are being alleviated, although we still do need long-term studies.”

Then there are more studies in his home field of surgery. “We are looking at new methods of pain control, and have been working on setting up a randomized trial of low-energy laser treatment for pain management and healing. We know from preliminary work that this does in fact help alleviate chronic pain and inflammation.”

**Future Health Challenges**

On the other hand, acceptance of new medical approaches may be putting the cart before the horse. Research of necessity goes hand in hand with the creation of a viable health care system for the 21st century: as always, the main question is one of money. “Physicians, academic centers, and hospitals both inner city and private, are severely strained trying to provide adequate care,” says Ginzburg. “Doctors are forced to see a lot of patients in order to meet their monthly means, and hospitals have cut back on personnel. Nursing provides the most care, but nurses are disappearing.”

Fast food companies also need to step up to the plate and provide foods that are healthy. “More vegetables and less saturated fats can reduce sickness,” says Ginzburg. “A revolution in the employment sector is sorely needed as well. Employers should set aside 30 minutes every day for physical exercise, possibly even at the work place.”

The aging of our population is perhaps the greatest challenge of all, according to Ginzburg, who says the government doesn’t provide money for adequate care in assisted living centers. “There needs to be an increase in funding for preventative medicine like exercise and nutrition, to help fight chronic diseases. There is no escaping the fact that the world’s population is getting older. I believe medical science has an obligation to do what it can to maintain quality of health in these longer lives.”

In the realm of longevity, Dr. Enrique Ginzburg definitely practices what he preaches. He maintains a healthy lifestyle incorporating regular exercise, healthy foods, and supplementation. “I try to ride a bicycle for aerobic exercise 15 minutes a day, followed by 20 minutes of weight training,” he says. “It’s important for me to do this at least five days a week. Exercise is a great stress fighter, and it helps me to keep in shape, mentally as well as physically.”

“More vegetables and less saturated fats can reduce sickness,” says Ginzburg.

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**Here is Dr. Ginzburg’s daily supplement regimen.**

- Omega-3s
- Policosanol
- Colostrum
- Vitamin B6
- CoQ10
- Vitamin D
- Multivitamin
- Resveratrol

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If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.
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- **Green Grasses and Sprouts** to provide a full array of chlorophyll-rich, nutrient-dense natural “green” foods that help detoxify and maintain youthful DNA integrity. In addition, clinical trials with chlorella supplements demonstrate that daily use of this green food may support healthy immunity and wound healing.²³

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- Spirulina (organic) 1000 mg
- Acerola (organic) 750 mg
- Wheat Grass (organic) 430 mg
- Maitake Mushroom Extract (organic) 400 mg
- Wheat Sprout (organic) 300 mg
- Barley Malt (organic) 300 mg
- Probiotic Blend (Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus rhamnosus, Bifidobacterium breve, Bifidobacterium longum) 300 mg
- Shiitake Mushroom (organic) 300 mg
- Cordyceps Mushroom Extract (organic) 300 mg
- Dulse (organic) 250 mg
- Beet Juice (organic) 250 mg
- Barley Grass (organic) 200 mg
- Brown Rice Bran (organic) 200 mg
- Cilantro (organic) 200 mg
- Suma (organic) 150 mg
- Flower Pollen Extract (organic) 120 mg

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REFERENCES:
Q: My sister has begun taking a new blood pressure medication. I am wondering if there are any additional side effects she should be aware of other than what was printed in the warnings from the pharmacy?

A: Yes. Many medications can deplete critical nutrients from the body. It is important to be aware of these potential deficiencies and be proactive to supplement when taking pharmaceuticals before other conditions set in. Let’s take a closer look:

As health care practitioners, we are taught to be on the alert for major side effects from the drugs we prescribe. Little or no attention has been focused on nutrients that are depleted by these medicines. Many drugs are “new-to-nature molecules,” meaning that they are not found in nature, and they never existed in the history of the world until a pharmaceutical company created them. Along with the beneficial effects these medicines provide come side effects, and in some instances, the depletion of nutrients.
We shall highlight some classes of compounds and some specific examples within these classes of drugs that have been documented to have caused nutrient depletion(s) in published scientific studies. According to Roger J. Williams, the discoverer of pantothenic acid, biotin, and the co-discoverer of folic acid, the effect of losses is based on a person’s “unique biochemical individuality.” In addition, the length of time a person takes these prescription medicines also helps determine the overall significance of the nutrient depletion.

For example, when a woman takes estrogen, it depletes the body of B vitamins, regardless of the form of estrogen (birth control pills, bioidentical hormones that contain estrogen, or synthetic estrogens). A woman taking a birth control pill such as Ortho-Novum® depletes her body of the following nutrients: folic acid, magnesium, tyrosine, vitamin B2, vitamin B3, vitamin B6, vitamin B12, vitamin C, and zinc.1

Vitamin B6 plays a role in approximately 130 reactions in the body. Vitamin B6 deficiency can lower serotonin and melatonin levels, elevate homocysteine levels, increase anxiety, decrease libido, and impair glucose tolerance. It’s important to take B vitamins together as a group instead of as individual vitamins. For example, you cannot make vitamin B6 if you don’t have enough vitamin B2. Also, you need vitamin B6 to make niacin (vitamin B3).

Magnesium is a co-factor for adenosine triphosphate (ATP), and is critical in energy production. “Serum magnesium can be normal in the presence of intracellular magnesium depletion, and the occurrence of a low serum level usually indicates significant magnesium deficiency.”3 A red blood cell (RBC) magnesium test would be a better test to determine magnesium deficiency, compared to serum magnesium.

A class of compounds called statins is famous for depleting the body of coenzyme Q10 (CoQ10), which can cause muscle aches and other troublesome side effects. CoQ10 is required for the conversion of carbohydrates to ATP, the body’s energy currency, in the cellular powerhouses called mitochondria. Fueling our bodies is essential to keep our cellular machinery in optimal working order. We want to put “good” fuel in the body, and that not only means nutrition from what we eat, but also nutrients that may be depleted from medicines that we are taking, such as CoQ10.

Steroid drugs such as prednisone4 and triamcinolone5 have been shown to deplete the body of calcium, magnesium, folic acid, potassium, selenium, vitamin C, and vitamin D.

When a woman takes estrogen, it depletes the body of B vitamins, regardless of the form of estrogen.
Even the commonest of drugs, e.g., aspirin, depletes folic acid, iron, potassium, sodium, and vitamin C.6 Acetaminophen depletes glutathione.7

Surprisingly, antibiotics deplete a wide variety of nutrients, and not so surprisingly, they deplete normal gut flora. For example, trimethoprim8 and quinolone antibiotics such as Cipro®9 deplete the body of nearly the same gut flora and the same nutrients: Bifidobacterium bifidum, Lactobacillus acidophilus, biotin, folic acid, inositol, vitamin B1, vitamin B2, vitamin B3, vitamin B6, vitamin B12, and vitamin K.

Blood pressure-lowering medications routinely deplete nutrients. Here are some examples of classes and agents that induce nutrient losses:

- Loop diuretics like Lasix®10 deplete the body of calcium, magnesium, potassium, sodium, vitamin B1, vitamin B6, vitamin C, and zinc. Loop diuretics increase magnesium excretion and inhibit passive magnesium absorption.11
- Thiazide diuretics like hydrochlorothiazide12 deplete the body of CoQ10, magnesium, potassium, phosphorus, sodium, and zinc.
- Beta blockers such as propranolol13 deplete the body of CoQ10 and melatonin.
- ACE inhibitors such as lisinopril14 deplete the body of zinc and sodium.

There are legions of prescriptive medicines that deplete nutrients from the body. The unintended consequences from these nutrient losses can affect your energy, mood, libido, immune function, and in short, your life! This is a clarion call to increase awareness for drug-induced nutrient losses from medicines used on a regular basis.

To learn more about drug-induced nutrient depletion, the reference book Drug-Induced Nutrient Depletion Handbook (Lexi-Comp Inc., 2001) by Pelton and LaValle is an excellent resource.

If you have any questions on the scientific content of this article, please contact a Life Extension® Health Advisor at 1-866-864-3027.

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References


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About the Author:
Harlan C. Bieley, MD is a physician who practices anti-aging and functional medicine in Palm Beach County, Florida. Dr. Bieley uses a multi-modal approach to treating patients that incorporates medicine, nutrition, technology, and lifestyle interventions so that his patients can “Function Higher—Physically, Mentally, Sexually”®, for a better quality of life. Dr. Bieley is Board Certified and is an Advanced Fellow in Anti-Aging and Regenerative Medicine through the American Academy of Anti-Aging Medicine.* For further information call (561) 842-7422, or view: www.HealthyAgingMedicalCenter.com.

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The FDA and the US Department of Justice (DOJ) caused the Mg-deficient-water problem by Un-Constitutionally destroying the American mineral water industry in the 1930’s, in the mistaken belief that pure water was good, and that mineral water was just impure water. No other country has ever destroyed their mineral water industry.

For decades, the evidence has been overwhelming that Americans are very deficient in Mg, as evidenced by the 23% shortfall from the RDI, yet the FDA and DOJ have covered up their blunder, getting a Federal lawsuit dismissed before the evidence could be shown, and keeping silent about the millions of deaths indicated by over 50 epidemiological studies from nine countries. Recent studies clearly confirm that water-borne Mg is far, far better in preventing cardiovascular pathologies than food-borne Mg.

Epidemiological studies indicate that millions of Americans have died due to the FDA’s and DOJ’s destruction of the American mineral water industry. See:

www.mgwater.com/anderson.shtml
www.mgwater.com/finland.shtml
www.mgwater.com/lancet.shtml
www.mgwater.com/singh.shtml

Now, it is up to the FDA and DOJ to end this travesty, requiring the Mg content of bottled or canned beverages to be put in labels’ nutrition panels, and requiring that all bottled or canned beverages contain at least 25 mg of Mg per liter. FDA and DOJ have ignored petitions and a lawsuit, continuing to kill Millions of Americans just to cover-up their blunder.

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References
2. Ostomy Wound Manage. 2006 Apr;52(4):82-6, 88, 90, passim.
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**24-HOUR URINARY PROFILES**

- **UNITARY COMPRESS PANEL (LCM400)** $472.50
  - This 24-hour urinary steroid hormone profile contains a combination of 30 hormones and metabolites. This panel may be used to evaluate bi-identical hormone replacement therapy.

- **UNITARY COMPREHENSIVE PANEL (LCM4001)** $360
  - This 24-hour urinary steroid hormone profile contains a combination of 17 hormones and metabolites. This panel may be used to evaluate bi-identical hormone replacement therapy.

- **UNITARY ADRENAL PROFILE (LCM4002)** $315
  - This 24-hour urine test measures a combination of 12 steroid hormones and metabolites synthesized by the adrenal cortex and may prove useful in the evaluation of endocrine disorders, stress, adrenal insufficiency, and more.

- **UNITARY ESTROGEN PROFILE (LCM4001)** $281.25
  - This 24-hour urinary steroid hormone profile contains a combination of 8 hormones and metabolites. This panel may be used to evaluate bi-identical hormone replacement therapy.

* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional $35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.
** This test is packaged as a kit, requiring a finger stick performed at home.
### Most Popular Single Tests

#### HORMONES
- **CORTISOL (LC004051)**
  - This test is to measure adrenal function.
  - $39

- **ADRENOCORTICOTROPIC HORMONE (ACTH)** (LC004440)
  - A pituitary function test useful in evaluating adrenocortical function.
  - $91.50

- **DHEA-SULFATE (LC04697)**
  - This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.
  - $61

- **DIHYDROTESTOSTERONE (DHT)** (LC500142)
  - Measures serum concentrations of DHT.
  - $98

- **ESTRADIOL (LC010363)**
  - Primarily for women. Determines the proper amount in the body.
  - $47

- **INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 (IGFBP3)** (LC140152)
  - Elevated levels in hypertensive individuals have been associated with a nine-fold increase of carotid arteriosclerosis.
  - $75

- **INSULIN FASTING** (LC04333)
  - Can predict those at risk of diabetes, obesity, and heart and other diseases.
  - $42

- **PREGNENOLONE** (LC140707)
  - Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing’s syndrome.
  - $116

- **PROGESTERONE (LC004317)**
  - Primarily for women. Determines the proper amount in the body.
  - $55

- **SEX HORMONE BINDING GLOBULIN (SHBG)** (LC082016)
  - This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.
  - $33

- **SOMATOMEDIN C (IGF-1)** (LC010363)
  - Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality.
  - $75

- **TOTAL AND FREE TESTOSTERONE** (LC140103)
  - Determines whether testosterone replacement should be considered as a therapy for depression, abdominal obesity, low energy, poor mental performance, or loss of libido.
  - $99

- **URINARY 2/16 ESTROGEN METABOLITE RATIO** (LCU73000)
  - This ratio is relevant as a risk factor for estrogen-sensitive diseases including breast and cervical cancers, osteoporosis, and recurrent respiratory papillomatosis.
  - $128

#### CARDIO RISK
- **Lp-PLA2 (PLAC TEST)** (LC141275)
  - This test is used in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.
  - $125

- **C-REACTIVE PROTEIN (HIGH-SENSITIVITY)** (LC120766)
  - Measures inflammation factors in arteries. Recent studies indicate that C-reactive protein may be the most accurate risk factor for predicting heart attack and stroke.
  - $42

- **APOLIPOPROTEIN ASSESSMENT - (APO A1 + APO D + RATIO)** (LC216010)
  - This ratio correlates with risk of coronary artery disease and is useful in the presence of borderline elevations of cholesterol.
  - $55

- **FIBRINOGEN** (LC001610)
  - High levels of this blood-clotting factor increase the risk of heart attack and stroke.
  - $31

- **HOMOCYSTEINE** (LC706994)
  - Can indicate if you are likely to have a heart attack or stroke. Even if you take folic acid, you may still have dangerously high levels of this artery-clotting metabolic debris that can be lowered with high doses of folic acid and vitamin B6.
  - $64

- **VAP™ TEST (LCB04500)** (UPDATED)
  - The VAP cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.
  - $31

#### MALE HEALTH
- **PSA (PROSTATE-SPECIFIC ANTIGEN)** (LC010322)
  - Can provide an early warning sign for prostate disorders and possible cancer.
  - $90

- **FREE-PSA (INCLUDES TOTAL PSA)** (LC480780)
  - Recommended to determine if an elevated PSA is indicative of prostate cancer.
  - $61

#### GENERAL HEALTH
- **CELIAC DISEASE ANTIBODY SCREEN** (LC334971)
  - This test measures deamidated gliadin IgA, tissue transglutaminase IgA, and serum IgA.
  - $99

- **VITAMIN D (250H)** (LC081950)
  - This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.
  - $47

- **VITAMIN C** (LC901479)
  - Levels of vitamin C are used to measure nutritional status.
  - $47

- **FOOD SAFE ALLERGY TEST** (LCM73001)
  - This test measures delayed (IgE) food allergies for 45 common foods.
  - $174

**For non-member prices call 1-800-208-3444**
**Products**

**AMINO ACIDS**
- Acetyl-L-Carnitine
- Acetyl-L-Carnitine-Arginate
- Branched Chain Amino Acids
- DL-Phenylalanine Capsules
- GABA Powder
- Glycine Capsules
- Glycine Powder
- Arginine Capsules
- L-Arginine Free Base Powder
- Arginine/L-Orotate Capsules
- L-Carnitine Capsules
- L-Cysteine Capsules
- L-Glutathione, L-Cysteine & C
- L-Glutamine Capsules
- L-Glutamine Powder
- L-Lysine Capsules
- L-Lysine Powder
- L-Tyrosine Tablets
- Mega L-Glutathione Capsules
- N-Acetyl Cysteine Capsules
- Optimized Carnitine with GlycoCarn®
- PharmaGABA
- Super Carnosine Capsules
- Taurine Capsules
- Tryptophan (Optimized) Tryptopure® Plus
- Acetyl-L-Carnitine

**BRAIN HEALTH**
- Acetyl-L-Carnitine
- Acetyl-L-Carnitine-Arginate
- CDP Choline Capsules
- Cognitex with NeuroProtection Complex
- Cognitex with Pregnenolone & NeuroProtection Complex
- DMAE
- DMAE-Ginkgo
- Ginkgo Biloba Certified Extract™
- Huperzine A
- Lechitin with B5 and BHA
- Lecithin Granules
- Methylcobalamin Lozenges
- Optimized Ashwagandha Extract
- Phosphatidylcholine Capsules
- Rhodiola Extract
- Super Ginkgo Extract
- Vinpocetine

**DIGESTIVE**
- Agave Digestive-Immune Support
- Bromelain Powder
- Carnosoothe w/PicroProtect Digest RC™
- Enhanced Super Digestive Enzymes (also available with Probiotics)
- Florastor
- Intact Digest
- Life Flora™
- Natural Esophaguard
- N-Zymes™
- Pancreatin
- Primal Defense
- Regimint™
- Saccharomyces Boulardii-ramos

**ERYD AND SARDY PRODUCTS**
- Blast™
- Dual-C
- Inner Power™
- Memory Upgrade

**EYE CARE**
- Bilberry Extract
- Blackcurrant Freeze Dried Extract
- Brite Eyes III
- Overcast Polarized Sunglasses
- Solarshield Sunglasses
- Super Zeaxanthin with Lutein & Meso-Zeaxanthin (Plus Astaxanthin also available)
- Vision Optimizer

**FIBER**
- Apple Pectin Powder
- Fiber Food
- Hi-Lignan® Nutri-Flax®
- SlimStyles® FGX
- WellBetx FGX® Soluble Fiber Blend

**HEART CARE**
- Dr. Proctor’s Advanced Hair Formula
- Dr. Proctor’s Shampoo
- Healthy Hair Spray
- Life Extension Shampoo and Conditioner
- Super-Absorbable Tocotrienols

**HEART HEALTH**
- Advanced Lipid Control
- Cho-Less
- D-Ribose Capsules
- D-Ribose Powder
- Enhanced CoQ10 with Brewer’s Yeast
- Fibrinogen Resist
- Forskolin
- Homocysteine Resist
- Low Dose Aspirin (Enteric Coated)
- Natural BP Management
- Peak ATP™ with GlycoCarn®
- Policosanol
- Red Yeast Rice
- Super Absorbable CoQ10™ with d-Limonene
- Super Omega-3 EPA/DHA with Sesame Lignane & Olive Fruit Extract
- Super Ubiquinol CoQ10
- Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support
- Sytrinol™
- Theflavin Standardized Extract
- TMG Powder
- TMG Tablets
- Vascular Protect

**HERBAL/PHYTO PRODUCTS**
- Artichoke Leaf Extract
- Astaxanthin
- Berry Complete
- Blackcurrant Juice Concentrate
- Blueberry Extract
- Butterbur Extract w/Standardized Rosmarinic Acid
- Calcium D-Glucarate
- Cilantro Herbal Extract
- Citrus Bioflavonoids
- Enhanced Berry Complete with RZD™ Acai Grapeseed Extract with Resveratrol & Ferulic Acid
- Huperzine A with Natural Vitamin E
- Kolic® Garlic Formula 105
- Kolic® Reserve
- Lycopene
- Mega Green Tea Extract
- Mega Green Tea Extract (Decaffeinated)
- Mega Lycopene
- Methylsilymarin with Isosilybin B
- Nutrin
- Optimized Ashwagandha Extract
- Pomegranate Extract
- Pomegranate (Full-Spectrum) Pomegranate™
- Pomegranate Juice Concentrate
- ProGreen®
- Pure Gα™
- Pycnogenol
- Optimized Quercetin
- Resveratrol with Synergistic Grape-Berry Actives

**HORMONES**
- 7-Keto® DHEA
- DHEA
- DHEA Complete
- GH Pituitary Support Day Formula
- GH Pituitary Support Night Formula
- Melatonin
- Melatonin Timed Release
- Natural Estrogen with Pomegranate Extract
- Pregnenolone
- ProFem Cream
- Pure IGF
- Super Miraforte with Standardized Lignans

**IMMUNE ENHANCEMENT**
- Agave Digestive-Immune Support
- AHCC™ (Active Hexose Correlated Compound)
- Buffered Vitamin C Powder
- Echinacea
- Enhanced Life Extension Whey Protein 20g Hyperimmune Egg
- Immune Protect with PARACTIN®
- Lactoferin
- Malate SX Fraction
- Norwegian Shark Liver Oil
- Primal Defense™
- ProBoost™ Thymic Protein A
- Pure Gar®
- Sambu® Guard
- Theralac Capsules
- Thymic Immune Factors
- Ultimate Flora Advanced Immunity
- Vitamin C with Dihydroquercetin
- Zinc Lozenges with Vitamin C

**INFLAMMATORY REACTIONS**
- Artho-Immune Joint Support
- ArthroMax™ with Theflavins
- Barlean’s Kids DHA
- Boswellia
- Boswellia™ Topical Cream
- Bromelain (Specially-coated)
- Coromega Kids Brain and Body (DHA)
- DHA 240
- Emulsified Norwegian Cod Liver Oil
- Emulsified Super Twin EPA/DHA
- Fast Acting Joint Formula
- 5-LOXIN®
- Mega EPA/DHA
- Mega GLA with Sesame Lignans
- MSM
- Natural Relief 1222™ Cream
- PhosphOmega™ Krill Oil
- Perilla Oil
- Serrafflaxyme
- SODzyme™ with GlisODin® and Wolfberry
- Super Omega-3 EPA/DHA with Sesame Lignanes & Olive Fruit Extract
- Tart Cherry
- Udo’s Choice Oil
- Zyflamend Easy

**LIVER HEALTH**
- Branch Chain Amino Acids
- HepatoPro
- Mega Silymarin with Isosilybin B
- N-Acetyl Cysteine
- SAML
- Silymarin
MINERALS
Bisili
Bone Restore
Bone Strength Formula w/KoAct™
Bone-Up™
Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
Iodoral
Iron Protein Plus
Magnesium
Magnesium Citrate
Mineral Formula for Men
Mineral Formula for Women
Only Trace Minerals
OptiZinc
Sea-Iodine™
Se-Methylselenocysteine
Vanadyl Sulfate
Zinc/Vitamin C Lozenges

MICHELLEGAN
Blood Pressure Monitor Arm Cuff Medium
Cell Sensor Gauss Meter™
Great Gelatin Capsules
The Pill Cutter and Grinder

MITOCHONDRIAL SUPPORT
Acetyl-L-Carnitine
Acetyl-L-Carnitine-Argetine
Mitochondrial Energy Optimizer
Optimized Carnitine with GlycoCarn®
Super Absorbable CoQ10™ with d-Limonene
Super Alpha Lipoic Acid with Biotin
Super R-Lipoic Acid
Super Ubiquinol CoQ10™ with d-Limonene

MOOD RELIEF
L-Theanine
5-HTP
Natural Stress Relief
Optimized Tryptophan™ Plus SAAGM
St. John’s Wort Extract
Tryptophan™ L-Tryptophan

MOUTH CARE
Advanced Oral Hygiene
Dr. Tung’s Tongue Cleaner
Life Extension Mouthwash w/Pomegranate
Life Extension Toothpaste
Mist Oral III™ with CoQ10

MULTIVITAMIN
Children’s Formula Life Extension Mix
Comprehensive Nutrient Pack
Life Extension Booster
Life Extension Mix™ Capsules
Life Extension Mix™ Powder
Life Extension Mix™ Tablets
Life Extension Mix™ w/o Copper Capsules
Life Extension Mix™ w/o Copper Tablets
Life Extension Mix™ w/Extra Niacin
Life Extension Mix™ w/Extra Niacin w/o Copper
Life Extension Mix™ w/Stevia Powder
Life Extension Mix™ w/Stevia w/o Copper Powder
Life Extension Once-Per-Day
Life Extension Two-Per-Day
Super Booster Softgels w/Advanced K2 Complex
Vital Greens Mix

PET CARE
Life Extension Cat Mix
Life Extension Dog Mix

PROSTATE & URINARY HEALTH
BetterWOMAN™
Optimized Cran-Max® with UTIRose™
5-LOXIN® (Water-Soluble) Pumpkin Seed Extract
Super Saw Palmetto with Beta-Sitosterol
Super Saw Palmetto/Nettle Root Formula w/Beta-Sitosterol
Ultra Natural Prostate Formula

SKIN CARE
Anti-Aging Mask
Anti-Glycation Serum
Antioxidant Facial Mist
Antioxidant Rejuvenating Foot Cream
Antioxidant Rejuvenating Foot Scrub
Antioxidant Rejuvenating Hand Cream
Antioxidant Rejuvenating Hand Scrub
Anti-Redness & Blemish Lotion
Cellulite Supress™ Formula
Corrective Clearing Mask
Derma Whey
Dual-Action MicroDerm Abrasion
Face Rejuvenating Antioxidant Cream
Enhanced FernBlock® with Sendara™
Fine Line-Less
Hair Supress Formula
Healing Mask
Hyaluronic Facial Moisturizer
Hydroderm®
Lavilin Underarm Deodorant
Life Extension Sun Protection Spray
Lifting & Tightening Complex
Melatonin Cream
Mild Facial Cleanser
NaPCA w/Aloe Vera
Neck Rejuvenating Antioxidant Cream
New Face Solution
Peel Off Cleansing Mask
Pigment Correcting Cream (Ultra) Rejuvenex®
Rejuvenex® Body Lotion
Rejuvenex® Factor
Rejuvenating Serum
Skin Lightening Serum
Skin Stem Cell Serum
Total Sun Protection Cream
Triple Action Under Eye Rejuvenator
Ultra Rejuvenex®
Ultra Rejuvenex® w/ Progesterone
Ultra Rejuvenex® w/o Progesterone
Ultra Lip Plumper
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin K Healing Cream

SOY
Natural Estrogen w/Pomegranate
Soy Power Powder
Soy Protein Concentrate
Super Absorbable Soy Isoflavones
Ultra Soy Extract

SPECIAL PURPOSE FORMULA
Anti-Alcohol Antioxidants w/HepatoProtection Complex
Benfotamine w/Thiamine
Breast Health Formula
Butterbur Extract w/Standardized Rosmarinic Acid
Chlorophyll w/Zinc
Curcumin w/Sesame Lignans
CR Microned Longevity Formula
Derma-Vita™
Enhanced Cinsulin® w/Glucose Management Proprietary Blend
EDTA (European Leg Solution) Diosmin95
Fem Dophilus
Femmenessence MacaPause®
GlucFit™
Ideal Bowel Support 299V
Lustri™
Maitake SX-Fraction™
Menopause Solutions
Mirga-eze™
Natural Female Support
Organic Total Body Cleanse
Penta-Sol™
Potassium Iodide
Prelox® Natural Sex for Men®
Pyridoxamine
Rosmarinic Acid Extract

SPORTS PERFORMANCE
Enhanced Life Extension Protein
DMG (N, n-dimethylglycine)
Insolise
L-Glutamine Capsules
L-Glutamine Powder
Micronized Creatine Capsules
Micronized Creatine Powder
Octacosanol

VITAMINS
Ascorbic Acid Powder
Ascorbyl Palmitate Capsules
B1
B2
B12
Beta-Carotene
Biotin Capsules
Biotin Powder
Buffered Vitamin C Powder
Complete B Complex
Elien® B12
Folic Acid + B12
Gamma E Tocopherol w/Sesame Lignans
Gamma E Tocopherol/Tocotrienols
Inositol Capsules
Inositol Powder
Liquid Emulsified Vitamin A
Mega Lycopen Extract
Methylcobalamin
MK-7
No-Flush Niacin
Optimized Folate
PABA Capsules
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K w/Advanced K2 Complex
Tocotrienols w/Sesame Lignans
Vitamin B3 (Niacin) Capsules
Vitamin B6
Vitamin B12 Tablets
Vitamin C
Vitamin D
Vitamin D3
Vitamin D3 w/Sea-Iodine™
Vitamin E
Vitamin K1

WEIGHT MANAGEMENT
Alli® Refill Pack
Belly Slim & Tone
7-Keto DHEA
DHEA Complete
Fucodoxanthin Slim™
HCA
Integra-Lean™ Irvingia
Optimized Irvingia® w/Phase 3 ™ Calorie Control Complex
Optimized Saffron w/Satieral™
Life Mix
Natural Appetite Control
SlimStyles® PGX Natural Weight Loss
Stevia Liquid Extract
Super CLA Blend w/Guarana and Sesame Lignans
Super CLA Blend w/Sesame Lignans
Udo’s Choice Wholesome Fast Food Blend
WellBetX PGX® Soluble Fiber Blend

PRODUCTS
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<th>No.</th>
<th>Product Description</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
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<td>0049</td>
<td>ACETYL-L-CARNITINE - 500 mg, 100 caps</td>
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<td>ARGinine/ORNITHINE POWDER - 150 grams of powder</td>
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<td>15.98</td>
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<td>ARTHROMAX® w/THETAFLAVIN® - 120 veg. caps</td>
<td>44.00</td>
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<td>ARTHRO-IMMUNE JOINT SUPPORT - 60 veg. caps</td>
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<td>00919</td>
<td>ARTICHOKE LEAF EXTRACT - 500 mg, 180 veg. caps</td>
<td>28.00</td>
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<td>59.00</td>
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<td>ASCORBIC ACID POWDER - 16 oz of powder vitamin C</td>
<td>38.00</td>
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<td>ASCORBYL PALMITATE CAPSULES - 500 mg, 100 caps</td>
<td>22.50</td>
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<td>00888</td>
<td>(OPTIMIZED) ASHWAHANADHA EXTRACT - 60 veg. caps</td>
<td>10.00</td>
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<tr>
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<td>6.00</td>
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<tr>
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<td>ASTAXANTHIN - 2 mg, 30 softgels</td>
<td>10.25</td>
<td>7.69</td>
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* These products are not 25% off retail price.

**SUB-TOTAL OF COLUMN 1**

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<thead>
<tr>
<th>No.</th>
<th>Product Description</th>
<th>Retail</th>
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<td>BELLY SLIM &amp; TONE - 6 fl oz</td>
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<tr>
<td>00920</td>
<td>BENFOTIAMINE W/ THIAMINE - 100 mg, 120 caps</td>
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<tr>
<td>00925</td>
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<tr>
<td>01206</td>
<td>BERRY COMPLETE - 30 veg. caps</td>
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<td>01406</td>
<td>(نينشاند) BERRY COMPLETE w/RZD® ACAI - 60 veg. caps</td>
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<tr>
<td>00664</td>
<td>BETA-CAROTENE - 25,000 IU, 100 softgels</td>
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<tr>
<td>00653</td>
<td>BETTERWOMAN - 40 caps</td>
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<tr>
<td>00497</td>
<td>BILBERRY EXTRACT - 100 mg, 100 caps</td>
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<tr>
<td>01006</td>
<td>BIOSIL® - 5 mg, 30 veg. caps</td>
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<td>01007</td>
<td>BIOSIL® - 30 ml</td>
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<td>00102</td>
<td>Biotin capsules - 600 mg, 100 caps</td>
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<tr>
<td>00145</td>
<td>Biotin powder - 30 grams of powder</td>
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<tr>
<td>00811</td>
<td>Bone Restore - 150 caps</td>
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<tr>
<td>01211</td>
<td>Bone strength formula w/KOACT™ - 120 caps</td>
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<tr>
<td>00313</td>
<td>Bone-Up™ - 240 caps (hydroxyapatite complex)</td>
<td>24.95</td>
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<tr>
<td>01079</td>
<td>Booster - 60 softgels</td>
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<tr>
<td>01380</td>
<td>(SUPER) Booster w/AWANCED K2 COMPLEX - 60 softgels</td>
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<td>00621</td>
<td>Boron Caps - 5 mg, 100 caps</td>
<td>3.95</td>
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<tr>
<td>00202</td>
<td>Boswellia - 100 caps</td>
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<td>00258</td>
<td>Boswellia topical cream - 4 oz jar</td>
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<tr>
<td>00253</td>
<td>Branched Chain Amino Acids - 90 caps</td>
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<tr>
<td>00999</td>
<td>Breast Health Formula - 60 veg. caps</td>
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<tr>
<td>00893</td>
<td>BRITE EYES III - 2 vials, 5 ml each</td>
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**SUB-TOTAL OF COLUMN 2**
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<th>Qty</th>
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<td>(OPTIMIZED) L-CARNITINE w/GLYCOCARN® - 60 veg. caps</td>
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<td>L-CARNITINE CAPSULES - 500 mg, 30 caps</td>
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<td>CARNOSSOOTH w/PicroProtekt™ - 60 veg. caps</td>
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<td>22.46</td>
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<td>(SUPER) CARNOUSINE CAPS - 500 mg, 90 caps</td>
<td>66.00</td>
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<td>01011</td>
<td>CELLULTINE SUPPRESS™ FORMULA - 6 fl. oz</td>
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<td>00390</td>
<td>CDP CHOLINE CAPS - 250 mg, 60 caps</td>
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<td>00998</td>
<td>CELL SENSOR-EMF DETECTION/MEASUREMENT METER</td>
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<td>01370</td>
<td>CHILDRENS FORMULA MIX - 100 chewable tablets</td>
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<td>00550</td>
<td>CHOLALEA - 500 mg, 200 tablets</td>
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<td>17.63</td>
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<td>01048</td>
<td>CHLOROPHYLLIN w/ZINC - 100 mg, 100 caps</td>
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<td>01339</td>
<td>CHOL-LESS - 90 capsules</td>
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<td>00541</td>
<td>CHOLINE CHLORIDE - 16 oz liquid</td>
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<td>00364</td>
<td>CHONDROITIN SULFATE CONCENTRATE - 400 mg, 60 tablets</td>
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<td>00169</td>
<td>CHROMIUM - 200 mcg polynicotinate, 365 caps</td>
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<td>01071</td>
<td>CHROMIUM ULTRA - 100 veg. caps</td>
<td>24.00</td>
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<td>00551</td>
<td>CILANTRO HERBAL EXTRACT - 1 oz</td>
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<td>01267</td>
<td>(ENHANCED) CINNUSLIN® w/GLUCOSE MGMT PROP BLEND - 90 veg. caps</td>
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<td>00069</td>
<td>CITRUS BIOFLAVONOID - 100 caps</td>
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<td>CDP CHOLINE CAPS - 6-4oz bottles</td>
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<td>CDP CHOLINE CAPS - 6-4oz caps</td>
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<td>CELL SENSOR-EMF DETECTION/MEASUREMENT METER</td>
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<td>29.95</td>
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<tr>
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<td>CHILDRENS FORMULA MIX - 100 chewable tablets</td>
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<td>13.50</td>
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<td>CHILDRENS FORMULA MIX - 4 bottles of 100 chewable tablets</td>
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<td>48.00</td>
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<td></td>
<td>CHOLALEA - 500 mg, 200 tablets</td>
<td>23.50</td>
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<td>17.63</td>
</tr>
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<td></td>
<td>CHLOROPHYLLIN w/ZINC - 4 bottles of 100 caps</td>
<td>80.00</td>
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<td>60.00</td>
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<tr>
<td></td>
<td>CHOL-LESS - 90 capsules</td>
<td>32.50</td>
<td></td>
<td>24.38</td>
</tr>
<tr>
<td></td>
<td>CHOLINE CHLORIDE - 16 oz liquid</td>
<td>14.95</td>
<td></td>
<td>11.21</td>
</tr>
<tr>
<td></td>
<td>CHONDROITIN SULFATE CONCENTRATE - 400 mg, 60 tablets</td>
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<td></td>
<td>14.96</td>
</tr>
<tr>
<td></td>
<td>CHONDROITIN SULFATE CONCENTRATE - 4 bottles of 60 tablets</td>
<td>72.00</td>
<td></td>
<td>54.00</td>
</tr>
<tr>
<td></td>
<td>CHROMIUM - 200 mcg polynicotinate, 365 caps</td>
<td>28.00</td>
<td></td>
<td>21.00</td>
</tr>
<tr>
<td></td>
<td>CHROMIUM ULTRA - 100 veg. caps</td>
<td>24.00</td>
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<td>18.00</td>
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<td></td>
<td>CILANTRO HERBAL EXTRACT - 4 bottles of 1oz</td>
<td>44.00</td>
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<td>33.00</td>
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<tr>
<td></td>
<td>(ENHANCED) CINNUSLIN® w/GLUCOSE MGMT PROP BLEND - 90 veg. caps</td>
<td>32.00</td>
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<td>24.00</td>
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<tr>
<td></td>
<td>CITRUS BIOFLAVONOID - 4 bottles of 100 caps</td>
<td>59.28</td>
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<td>44.46</td>
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**SUB-TOTAL OF COLUMN 3**

**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**SUB-TOTAL OF COLUMN 4**

**BUYERS CLUB ORDER FORM**

**AUGUST 2010**
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>80113</td>
<td>COSMESIS UNDER EYE REFINING SERUM - 1/2 oz</td>
<td>$629.95</td>
<td>$52.46</td>
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<tr>
<td></td>
<td>COSMESIS UNDER EYE REFINING SERUM - 2 bottles of 1/2 oz</td>
<td>123.12</td>
<td>92.34</td>
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<tr>
<td>80104</td>
<td>COSMESIS UNDER EYE rescue CREAM - 1/2 oz</td>
<td>69.95</td>
<td>52.46</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>COSMESIS UNDER EYE rescue CREAM - 2 bottles of 1/2 oz</td>
<td>123.12</td>
<td>92.34</td>
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<tr>
<td>80112</td>
<td>COSMESIS VITAMIN C SERUM - 1 oz</td>
<td>79.95</td>
<td>59.96</td>
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<tr>
<td></td>
<td>COSMESIS VITAMIN C SERUM - 2 bottles of 1 oz</td>
<td>140.72</td>
<td>105.54</td>
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<tr>
<td>80136</td>
<td>COSMESIS VITAMIN D LOTION - 4 oz</td>
<td>29.95</td>
<td>22.46</td>
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<tr>
<td></td>
<td>COSMESIS VITAMIN D LOTION - 2 bottles of 4 oz</td>
<td>56.00</td>
<td>42.00</td>
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<tr>
<td>80102</td>
<td>COSMESIS VITAMIN K HEALING CREAM - 1 oz</td>
<td>74.95</td>
<td>56.21</td>
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<tr>
<td></td>
<td>COSMESIS VITAMIN K HEALING CREAM - 2 bottles of 1 oz</td>
<td>131.92</td>
<td>98.94</td>
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<tr>
<td>00862</td>
<td>CRAN-MAX* - 500 mg, 60 veg. caps</td>
<td>17.50</td>
<td>13.13</td>
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<td></td>
<td>CRAN-MAX* - 4 bottles of 60 veg. caps</td>
<td>60.00</td>
<td>45.00</td>
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<tr>
<td>01424</td>
<td>(OPTIMIZED) CRAN-MAX* with UTROI™ - 60 veg. caps</td>
<td>18.00</td>
<td>13.50</td>
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<tr>
<td></td>
<td>(OPTIMIZED) CRAN-MAX* with UTROI™ - 4 bottles of 60 veg. caps</td>
<td>64.00</td>
<td>48.00</td>
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<tr>
<td>00659</td>
<td>CREATINE CAPS MICRONIZED - 120 caps</td>
<td>10.95</td>
<td>8.21</td>
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<td>CREATINE CAPS MICRONIZED - 4 bottles of 120 caps</td>
<td>37.00</td>
<td>27.75</td>
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<td>00610</td>
<td>CREATINE POWDER MICRONIZED - 500 grams of powder</td>
<td>29.00</td>
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<td>CREATINE POWDER MICRONIZED - 4 bottles of powder</td>
<td>106.52</td>
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<td>01096</td>
<td>CREATINE-GLYCOLIC CITRUSorian™ - 1 kg vanilla</td>
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<td>CREATINE-GLYCOLIC CITRUSorian™ - 4 bottles of powder</td>
<td>168.00</td>
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<tr>
<td>01429</td>
<td>CR MIXTED LONGEVITY FORMULA - 60 veg. caps</td>
<td>39.00</td>
<td>29.25</td>
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<td>CR MIXTED LONGEVITY FORMULA - 4 bottles of 60 veg. caps</td>
<td>144.00</td>
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<tr>
<td>00912</td>
<td>(SUPER) CURCUMIN W/BIOPERINE™ - 800 mg, 60 caps</td>
<td>20.75</td>
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<tr>
<td></td>
<td>(SUPER) CURCUMIN W/BIOPERINE™ - 4 bottles of 60 caps</td>
<td>74.72</td>
<td>56.04</td>
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<td>00407</td>
<td>(SUPER BID) CURCUMIN™ - 400 mg, 60 veg. caps</td>
<td>30.00</td>
<td>22.50</td>
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<tr>
<td></td>
<td>(SUPER BID) CURCUMIN™ - 4 bottles of 60 veg. caps</td>
<td>106.00</td>
<td>79.50</td>
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<td>00064</td>
<td>(L) CYSTEINE CAPSULES - 500 mg, 60 caps</td>
<td>18.95</td>
<td>14.21</td>
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<tr>
<td></td>
<td>(L) CYSTEINE CAPSULES - 4 bottles of 60 caps</td>
<td>65.24</td>
<td>48.93</td>
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**D**

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<th>Qty</th>
<th>Total</th>
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<td>01063</td>
<td>DERMA-VITMS™ - 90 caps</td>
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<td>DERMA WHEY - 400 mg, 60 caps</td>
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<td>DERMA WHEY - 4 bottles of 60 caps</td>
<td>236.00</td>
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<tr>
<td>00356</td>
<td>(BARLEAN'S KID'S) DHA (Fruit Punch Flavor) - 8 fl. oz</td>
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<td>(BARLEAN'S KID'S) DHA (Fruit Punch Flavor) - 4 bottles of 8 fl. oz</td>
<td>80.00</td>
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<tr>
<td>00999</td>
<td>DHA 240 - 240 mg, 60 softgels</td>
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<td>DHA 240 - 4 bottles of 60 softgels</td>
<td>68.00</td>
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<td>00658</td>
<td>7-KETO® DHEA METABOLITE - 25 mg, 100 caps</td>
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<td></td>
<td>7-KETO® DHEA METABOLITE - 4 bottles of 100 caps</td>
<td>96.00</td>
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<td>7-KETO® DHEA METABOLITE - 4 bottles of 60 veg. caps</td>
<td>144.00</td>
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<tr>
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<td>DHEA - 25 mg dissolve in mouth 100 tablets pharmaceutical-grade</td>
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<td>DHEA - 4 bottles of 100 tablets pharmaceutical-grade</td>
<td>47.00</td>
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<td>DHEA COMPLETE - 60 veg. caps</td>
<td>48.00</td>
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<td>DHEA COMPLETE - 4 bottles of 60 veg. caps</td>
<td>172.80</td>
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<tr>
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<td>DHEA - 4 bottles of 100 caps</td>
<td>50.00</td>
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<td>00454</td>
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<td>DHEA - 4 bottles of 100 caps</td>
<td>40.00</td>
<td>30.00</td>
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<td>00862</td>
<td>DHEA - 50 mg, 60 caps</td>
<td>16.00</td>
<td>12.00</td>
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<td>DHEA - 4 bottles of 60 caps</td>
<td>56.00</td>
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<td>00883</td>
<td>DHEA - 100 mg, 60 caps</td>
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<td>DHEA - 4 bottles of 60 caps</td>
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**SUB-TOTAL OF COLUMN 5**
## Buyers Club Order Form

To order online visit: www.lifeextension.com

### SUB-TOTAL OF COLUMN 7

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<tr>
<th>No.</th>
<th>Retail</th>
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<th>Total</th>
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<td>01273</td>
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<td>00034</td>
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** Due to license restrictions, this product is not for sale to wholesalers outside the United States of America and Canada.

* Can only be sold in the United States and cannot be sold into the health food retail store channel.

† Member pricing not valid on this item.
**Buyers Club Order Form**

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**SUB-TOTAL OF COLUMN 9**

**SUB-TOTAL OF COLUMN 10**

AUGUST 2010

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
### LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

**August 2010**

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**SUB-TOTAL OF COLUMN 11**

|       | $673.64 | $800.00 | $1,473.64 |

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**SUB-TOTAL OF COLUMN 12**

|       | $2,102.54 | $1,673.64 | $3,776.18 |

**To order online visit: www.lifeextension.com**

### Buyers Club Order Form

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**SUB-TOTAL OF COLUMN 11**

|       | $673.64 | $800.00 | $1,473.64 |

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**SUB-TOTAL OF COLUMN 12**

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**SUB-TOTAL OF COLUMN 13**

**SUB-TOTAL OF COLUMN 14**

* Product cannot be sold outside the USA.
**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

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**Note**: These products are not 25% off retail price.
## Buyers Club Order Form

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Address

City ST ZIP

Email Phone

☐ Check enclosed *(payable to Life Extension Foundation*)

☐ Charge my cc: 

Card # Exp.

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**ORDER TOTALS**

Sub-Total A (Sub-total of Columns 1 through 19)

- Postage And Handling (Any size order, continental U.S.) $5.50
- C.O.D.s (Add $7 for C.O.D. orders)

**GRAND TOTAL** (Must be in U.S. dollars)

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**BILL TO ADDRESS**

- NAME
- E-MAIL
- ADDRESS
- CITY/STATE/ZIP-POSTAL CODE
- COUNTRY
- PHONE
- FAX
- VISA/MASTERCARD/AMEX/DISCOVER 
- EXP. DATE
- SIGNATURE

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**SHIP TO ADDRESS**

- NAME
- E-MAIL
- ADDRESS
- CITY/STATE/ZIP-POSTAL CODE
- COUNTRY
- PHONE
- FAX
- SIGNATURE

---

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- CHECK HERE FOR UPS RED LABEL (OVERNIGHT)

---

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E-MAIL

ADDRESS

CITY/STATE/ZIP-POSTAL CODE

COUNTRY

PHONE

FAX

VISA/MASTERCARD/AMEX/DISCOVER #

EXP. DATE

SIGNATURE

☐ COD

☒ UPS RED LABEL

☒ UPS BLUE LABEL

To order online visit: www.lifeextension.com

Buyers Club Order Form

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A Partnership in Men’s Health

New Chapter® Zyflamend® and LifeExtension® Natural Prostate

Understanding Prostate Health

Men may not talk openly about prostate health but it’s something they need to pay attention to, especially if they’re over 40. Beyond that age, physiologic factors such as hormone imbalance, inflammation, and oxidative stress can begin to affect the size of the prostate, as well as the integrity of its cellular DNA. Fortunately, scientific evidence suggests herbal therapeutics and supplemental nutrients—especially those that support hormone balance, promote a healthy inflammation response, and modulate oxidative stress—are incredibly valuable for supporting and maintaining prostate health.*

The Inflammation Connection

Emerging scientific evidence suggests the inflammatory response can affect the growth of prostate cells. Inflammation, particularly the kind generated by activation of an inflammatory enzyme called 5-lipoxygenase (5 LX), is thought to affect cellular DNA, disrupting the mechanisms responsible for maintaining normal cell growth and replication.* Consequently, modulating 5 LX is a key strategy for maintaining prostate health.*

ZYFLAMEND® is the #1 selling herbal for a healthy inflammation response. Containing hundreds of bioactive constituents, including ten of the most researched botanicals, it provides a multitude of healthy advantages in addition to its positive inflammation properties. Recent research studies suggest daily Zyflamend supplementation may be an effective strategy to modulate inflammation and promote healthy prostate function, normal cell growth, healthy aging, and healthy joint and heart function.*

Zyflamend is the subject of ongoing research at preeminent research centers in the United States and represents a scientific breakthrough in the maintenance of a healthy inflammation response.*

ULTRA NATURAL PROSTATE FORMULA® contains the most scientifically substantiated nutrients to help protect the prostate gland and maintain its healthy function. Now included in the formula is a standardized European pumpkin seed oil extract rich in delta-7 sterols and fatty acids to support a healthy prostate. A supercritical CO2 extraction technology supplies optimal amounts of these key phytoneutrients to complement the fatty acid composition of saw palmetto. It is sourced from a unique variety of pumpkin cultivated specifically to yield higher ratios of these compounds than pumpkins grown for commercial use.

Ultra Natural Prostate Formula provides scientifically validated standardized plant extracts that have been shown to promote healthy prostate function. No other prostate protection formula provides such a broad array of nutrients to support the multiple factors involved in maintaining a healthy prostate gland.

To order Zyflamend or Ultra Natural Prostate, call 1-800-544-4440 or visit www.LifeExtension.com

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*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
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Diminished levels of neurotransmitters and other brain compounds profoundly affect cognition and memory in aging adults. Cognitex was developed in 1982 to increase brain levels of acetylcholine — a neurotransmitter that enables neurons to communicate. Over the years, Cognitex has been improved with the addition of nutrients used in Europe to protect and enhance neurological function.

Cognitex with Pregnenolone & NeuroProtection Complex provides the following scientifically validated nutrients to provide broad-spectrum neurological support:

- **Uridine-5'-monophosphate (UMP)** is a phosphatide building block of RNA-DNA that is critical to optimal brain function and the health of neuronal cell membranes. Naturally found in the milk of nursing mothers, UMP is essential not only for the growth and development of infant brains, but also for healthy cognitive function in aging adults.

- **Sharp-PS® GOLD**, a rich phosphatidylserine compound bound to DHA, promotes already-normal neuronal cell membrane function and structure.

- **Alpha-glyceryl phosphoryl choline (A-GPC)** boosts acetylcholine, a critical neurotransmitter that declines with age.

- **Vinpocetine** enhances circulation and oxygenation to brain cells, improves neural electrical conductivity, and protects against neuron-destroying excitotoxicity.

- **Phospholipid-grape seed extract** bound together results in a compound that is better absorbed into the bloodstream where it improves blood vessel tone and elasticity, thus enhancing blood circulation and oxygen flow to the brain.

- **Wild blueberry extract** protects against free-radical damage in the brain and helps maintain fluid balances already within the normal range.

- **Sensoril® Ashwagandha Extract** helps alleviate mental fatigue by inhibiting an enzyme (acetylcholinesterase) that degrades acetylcholine in the aging brain.

- **Proprietary NeuroProtection Complex Blend** contains standardized extracts of hops, ginger, and rosemary — proven to help with inflammation.

- **Pregnenolone** is a hormone that may be especially beneficial to the brain.

The retail price for 90 softgels of Cognitex (with or without pregnenolone) is $74 (Item #00922) and $72 (Item #00921), respectively. If a member orders four bottles of either version, the price per bottle is reduced to just $49.95 and $48, respectively.

**Caution:** Cognitex is also available without pregnenolone for those with existing steroid hormone-sensitive cancer.

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A landmark study reveals that the brain chemistry behind compulsive eating and drug addiction is identical. A newly discovered saffron extract has been shown to modulate these neurochemical factors and curb appetite safely.

Obesity-driven diabetes or “diabesity” is fast becoming the greatest epidemic in human history. Yet conventional medicine’s inadequate response is failing its victims. *Life Extension®* examines the overlooked causes and offers a multimodal preventive strategy.

People who consume more omega-3 fatty acids have larger, more functional brains. Discover how the proper dose of omega-3s wards off mental illness, age-related neurological disorders, and even reverses aspects of brain aging.

Rampant misuse of CT scans and X-ray imaging has finally drawn attention to their lethal effects. Here we detail an optimal radioprotective nutritional regimen, including polyphenols, trace minerals, and antioxidant compounds in case you need an X-ray or CT scan.