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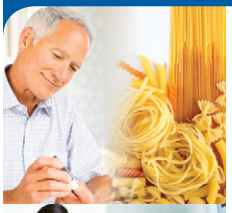
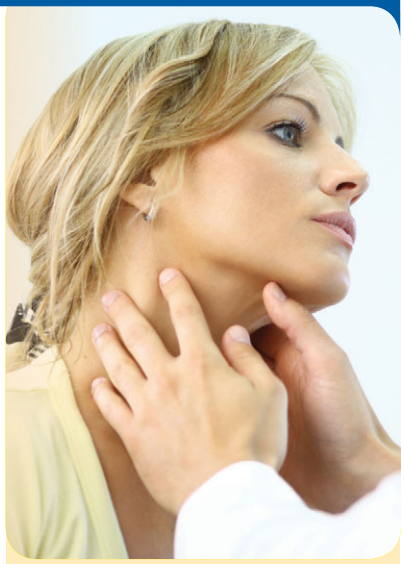
LifeExtension® Magazine

VOLUME TWENTY ONE / NUMBER TWELVE • December 2015

REPORTS





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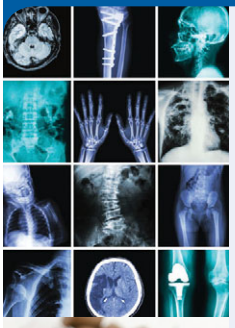

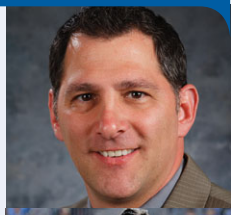

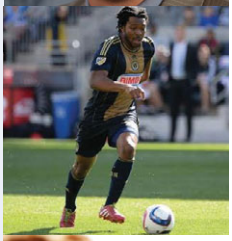

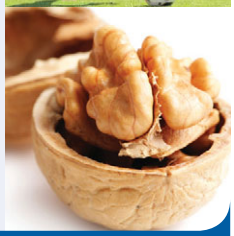

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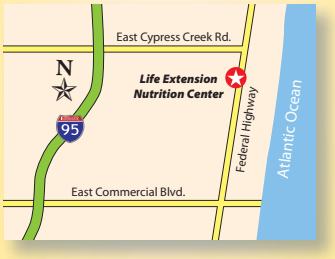

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Warning to Coumadin® (warfarin) Drug Users: Patients prescribed vitamin K-antagonist anticoagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental 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 your vitamin K supplement. Life Extension® provides several forms of low-dose vitamin K for physician consideration.

LifeExtension® Magazine

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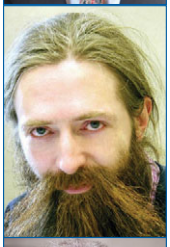

Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of Rejuvenation Research, the world's highest-impact peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association and sits on the editorial and scientific advisory boards of numerous journals and organizations.

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Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP
Dr. Dipnarine Maharaj is the Medical Director of the South Florida Bone Marrow Stem Cell Transplant Institute and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.

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.

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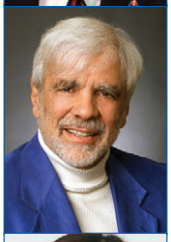

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored or co-authored 14 books, selling over 1.5 million copies.

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Progressive **loss of skeletal density** is a consequence of normal aging. Fortunately, an array of **nutrients** has been identified that can markedly impede and sometimes reverse this degenerative process.

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Note: Those taking the anticoagulant drug Coumadin® (warfarin) should use BONE RESTORE without vitamin K2.

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Consumer Reports Discovers Dangers Of CT Scans And X-Rays

BY WILLIAM FALOON

The **March 2015** issue of ***Consumer Reports*** published an in-depth article about the **cancer-causing** effects of medical **X-rays** and **CT scans**. The title of this ***Consumer Reports*** article is:

"***The Surprising Dangers Of CT Scans And X-rays***."[1]

We applaud ***Consumer Reports*** for publishing this expose. It will save human lives. We're taken aback, however, as to why the word "***surprising***" was used in the title.

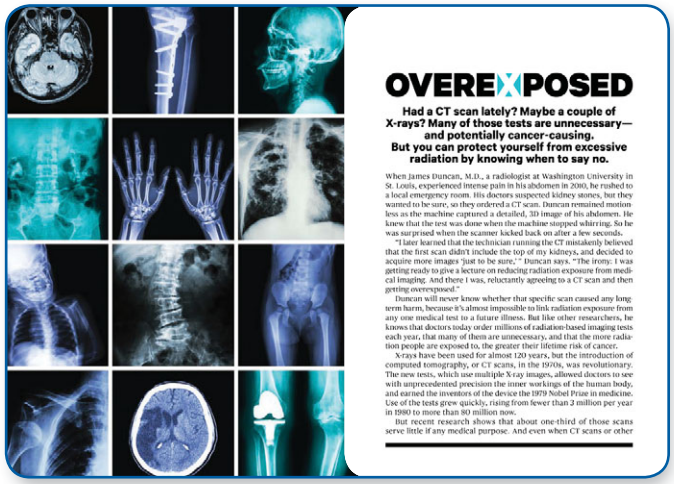
There's nothing ***surprising*** about the striking number of **cancer deaths** caused by medical imaging procedures like **CT scans**. These imaging devices emit high amounts of **ionizing radiation** that damage DNA and create mutations that can lead to cancer.

The **National Cancer Institute** estimates that at least **15,000** cancer deaths will occur as a result of **CT scans** performed in **2007**.[2,3]

This same report estimates **29,000** new cancer cases occurred in **2007** alone from **CT scan** exposure. Since exposure to radiation-emitting imaging procedures has risen approximately **6-fold**[4] since **1980**, the number of excess **cancers** being caused is potentially astronomical.

What may have prompted ***Consumer Reports*** to publish their article was a recent study that looked at people who had CT scans as children and then followed them for almost 10 years. This study found a **24%** increased **cancer risk** from just one **CT scan**, with each additional **CT** scan boosting cancer risk an additional **16%**. Cancer risk was greater with a younger age of exposure.[5] While overall cancer rates in this group were low, the statistical significance was robust, meaning these frightening increases in cancer rates are unlikely to have occurred by chance.

Our earlier warnings about the dangers of radiation from medical diagnostic procedures like CT scans were ridiculed and largely ignored. We hope that the ***Consumer Reports'*** investigative analysis will encourage more patients to stand up to their doctors and question the necessity of exposing their body to cancer-causing radiation. As you'll read in this article, many X-rays and CT scans performed today should not be done.



OVEREXPOSED

Had a CT scan lately? Maybe a couple of X-rays? Many of those tests are unnecessary—and potentially cancer-causing. But you can protect yourself from excessive radiation by knowing when to say no.

When James Duncan, M.D., a radiologist at Washington University in St. Louis, experienced intense pain in his abdomen in 2010, he rushed to a local emergency room. His doctors suspected kidney stones, but they wanted to be sure, so they ordered a CT scan. Duncan remained motionless as the machine captured a detailed, 3D image of his abdomen. He knew that the test was done when the machine stopped whirring. So he was surprised when the scanner kicked back on after a few seconds.

"I later learned that the technician running the CT mistakenly believed that the first scan didn't include the top of my kidneys, and decided to acquire more images 'just to be sure,'" Duncan says. "The irony: I was getting ready to give a lecture on reducing radiation exposure from medical imaging. And there I was, reluctantly agreeing to a CT scan and then getting overexposed."

Duncan will never know whether that specific scan caused any long-term harm, because it's almost impossible to link radiation exposure from any one medical test to a future illness. But like other researchers, he knows that doctors today order millions of radiation-based imaging tests each year, that many of them are unnecessary, and that the more radiation people are exposed to, the greater their lifetime risk of cancer.

X-rays have been used for almost 120 years, but the introduction of computed tomography, or CT scans, in the 1970s, was revolutionary. The new tests, which use multiple X-ray images, allowed doctors to see with unprecedented precision the inner workings of the human body, and earned the inventors of the device the 1979 Nobel Prize in medicine. Use of the tests grew quickly, rising from fewer than 3 million per year in 1980 to more than 80 million now.

But recent research shows that about one-third of those scans serve little if any medical purpose. And even when CT scans or other

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There is not a topic I have more hotly debated with physicians than the danger posed by ionizing radiation emitted from CT scans and X-ray imaging devices.

On a personal level, every doctor I have ever argued this point with has stated that CT scans and X-rays are **100%** safe. I rarely violate rules of debate by stating that someone is categorically wrong, but I have never stepped back from declaring that exposing one's healthy cells to **ionizing radiation** from medical diagnostic imaging (like CT scans) increases cancer risk.

Life Extension® long ago published the frightening numbers of Americans who are contracting cancer as a result of prior CT scans or X-ray exposure. Medical authorities are now somewhat aware of this data, yet few who prescribe CT scans or X-ray imaging are paying attention to it.

One-Third Of Radiation Scans Are Unnecessary

Each year, there are **72 million** CT scans performed in the United States.[6] This is up from **3 million** in 1980 when CT scans began to be aggressively marketed to doctors.[7] CT scans provide superior imaging compared to conventional X-rays, but at the cost of vastly higher doses of **ionizing radiation**.[7]

A recent report found that as many as one-third of CT scans and other diagnostics that expose patients to high levels of radiation are being done too frequently.[7] We at ***Life Extension***® believe that more than a third of radiation-emitting imaging procedures could be eliminated.

One obstacle we battle when it comes to this debate is physician prescribing practices that are very difficult to change. Doctors were taught in school that radiation from medical diagnostic imaging was very safe and posed no long-term risk to their patients. Throughout their residency and into practice, the idea that **ionizing radiation** from medical diagnostic imaging is safe, and does not increase long-term cancer risk, is *consistently* reinforced to physicians, often by radiologists. In addition, physicians are often in the practice of *defensive medicine*, and order unnecessary imaging tests born out of the fear of litigation.

Especially worrisome is the fact that some physicians have a *financial investment* in the very medical diagnostic imaging centers to which patients are referred.

Consumer Reports magazine now urges patients to ask if their doctor has a **financial interest** in a diagnostic imaging center. It should not come as a surprise that when physicians invest in a CT scanner or other radiology equipment, they then have a **financial incentive** to refer more of their patients for CT scans and other imaging tests.

Consumer Reports urges all patients to question their doctor when a CT scan or X-ray is ordered, as some problems can be managed without powerful doses of radiation.[8]

Widespread Ignorance Of The Dangers

Consumer Reports conducted a survey and found that only **4%** of patients prescribed a **CT scan** had the knowledge to say "no" to their doctor.[1] This prompted one enlightened doctor to state that patients need to take the lead in questioning whether a CT scan or X-ray is necessary.

A **2012** study was done of medical personnel who worked with patients undergoing abdominal CT scans (which often emit the most radiation). This study found that less than **50%** understood that these scans could cause cancer.[9]

Another study revealed only **9%** of emergency room physicians said they knew that CT scans increased cancer risk.[10]

This widespread ignorance amongst professionals on the front lines of medical care is alarming.

Until doctors get up to speed on the risks posted by radiation-emitting imaging devices, patients need to assert control and not capitulate to the exaggerated fears doctors instill to persuade patients to undergo unnecessary CT scans, X-rays, or other diagnostic imaging procedures involving ionizing radiation.

Defending Against Lawsuits

A study presented at the **2011** meeting of the **American Academy of Orthopedic Surgeons** provided clear evidence of why CT scans and other medical diagnostic imaging tests are being so overutilized.

It turns out that **35%** of imaging tests are being done by doctors out of fear of lawsuits.[1,11-13] In other words, if sued by a patient (and zealous personal injury attorney) for malpractice, doctors need hard evidence showing the patient was aggressively diagnosed, as well as treated.

How To Reduce Radiation Exposure From Medical Diagnostic Tests

A partial solution to the widespread overexposure to ionizing radiation is to turn down the amount of radiation emitted from each scan. This can be done because most modern CT scanners can be ***intensity modulated***. This means the dose of radiation needed to obtain a crisp picture of your insides can be greatly reduced based on your body mass and other factors.[14]

What hurried X-ray technicians have done too frequently is set the dose of radiation at the highest level for all patients, thereby eliminating the time needed to adjust the radiation dose to conform to each individual. This ensures great consistent images at the cost of many times the radiation dose required for most people. As a patient, you should insist that if a CT scan is needed, your body mass be evaluated and the lowest possible dose of radiation be used to obtain the needed images.[15,16]

A particularly disturbing trend pointed out by ***Consumer Reports*** is that children are too often being given adult-sized doses of radiation, which is many times what they need.[1] The higher dose directly increases the child's cancer risk, yet rushed radiology technicians don't want to bother turning down the **radiation intensity**. The pressure to put patients on a fast-moving assembly line, with little regard for individualized care, is epidemic throughout today's hurried and increasingly depersonalized world of mainstream medical practice.

Modern Imaging Saves Lives!

It is important to point out that CT scans save more lives than the cancers they cause.[14] The problem is they are being overused and wrongly used in too many cases.

For many diagnostics, **ultrasound** devices can provide a clear internal image while emitting no ionizing radiation.[17-19] **MRI** (magnetic resonance imaging) often provides a clearer picture than a CT scan for soft tissue,[20] but since MRIs cost much more, insurance companies increasingly are refusing to pay for them.[21]

Those who display outward symptoms of a **stroke** should insist on an immediate CT scan of their brain so that comprehensive stroke-reversal therapies can be promptly administered to reduce the risk of paralysis or death. CT scans can be done instantly compared to the much longer time it takes for magnetic resonance techniques. (Some hospital ER rooms are equipped to do quick MRI scans for stroke patients.)

When compared to the perils and pain of exploratory surgery, a CT scan is a breakthrough that should be utilized when appropriate.

For cancer patients, the use of multiple whole-body **PET/CT scans** with enhanced reading techniques provides enormous insight into whether treatments are working or need adjustment. For treatment of difficult and aggressive cancers, the long-term risk from exposure to the radiation from PET/CT scanners is less than the immediate risk posed by the aggressive cancer.[22,23]

My Pain Of Saying No To Dentists

Dentists are adamant about doing annual X-rays and represent the strongest proponents of prophylactic X-rays. Not one dentist I have encountered has ever acknowledged there is any risk posed by these annual X-rays.

I have refused dental X-rays for most of my life despite dire warnings by my dentists that there could be underlying tooth decay. When I developed some pain in my mouth two years ago, I consented to dental X-rays. No abnormality was revealed.

I then went to a medical specialist who said he could prescribe a CT scan of my entire jaw that might detect what was causing my considerable pain. This doctor also cautioned that some people develop a condition called **idiopathic oral facial pain** in which no underlying cause is detected by a CT scan. (Idiopathic means a disease of unknown origin.)

I declined the CT scan of my jaw and suffered fluctuating pain for almost a year and a half until the pain became so acute that I went back to the dentist for another dental X-ray, which this time revealed a single decayed tooth that was readily treated.

Had I opted for the CT scan, this decaying tooth would have likely been detected much earlier. Of course, very vulnerable parts of my head and neck would have also been exposed to high levels of radiation from the CT scan (much greater than typical dental X-rays).

So I paid a painful price for declining the CT scan of my jaw. I always like to relate real-world events so that readers understand the challenges of determining when to say "no" to a radiation-emitting imaging device. It's not always an easy decision.

Are Dental X-Rays Safe?

My dentist makes me sign a waiver of liability because I refuse to have annual **X-rays** done. Other dentists refuse to treat me unless I capitulate to X-rays whenever they want to do them. There, of course, is considerable clinical value in dentists being able to view under your enamel.

My concern about dental X-rays was partially vindicated when a **2012** study published in the journal ***Cancer*** showed that people exposed to annual dental X-rays were twice as likely to develop a brain tumor called a meningioma.[38] This type of tumor is usually benign and can be treated with radiation or surgery if needed, but who wants to go through this?

Startling Numbers Of Excess Cancers

In **2009**, the journal ***Archives of Internal Medicine*** published findings showing the potential for adverse effects of ionizing radiation from medical imaging procedures like CT scans.

This study led by the **National Cancer Institute** used a model of **radiation** risk over time based on CT scans administered in the year **2007**.

The results suggested that CT scans alone may contribute to **29,000** new cancer cases over time, and nearly **15,000** cancer deaths over time assuming **50%** mortality.[3]

Experts Historically Underestimated Radiation Risks

When radiation was first discovered, doctors were wildly enthusiastic about being able to peer inside the body of a living human.

Sadly, radiation killed its early pioneers, who had no idea of its dangers.

Even as knowledge of radiation's lethal properties became apparent, experts consistently underestimated the risks.

One tragic example was an individual named Clarence Dally who intentionally exposed himself multiple times to ionizing radiation from **Thomas Edison's** "fluoroscope" invention. Within a few months, Dally began suffering debilitating fatigue, body aches, and multiple burn-like lesions on his hands. These lesions turned out to be **cancer** that rapidly spread throughout his body. Dally lost both his arms to these malignant lesions, and died a painful death in **1904**. Thomas Edison was said to be haunted for the rest of his life by Dally's cancer and death, and refused to have anything more to do with ionizing radiation.[24]

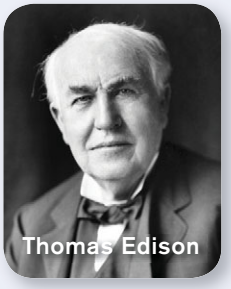

Thomas Edison

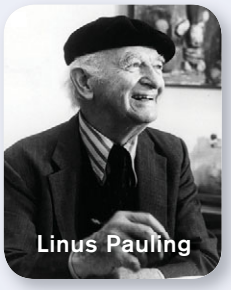
PHOTO BY LOUIS BACHRACH, BACHRACH STUDIOS, RESTORED BY MICHEL VUIJLSTEKE–UNITED STATES LIBRARY OF CONGRESS

In the **1950**s, our federal government routinely conducted above-ground testing of **nuclear bombs** in the Nevada desert and claimed the radioactive fallout that spread throughout much of the United States was "harmless." In **2002**, the federal government admitted that the radiation emitted from these nuclear weapons tests caused **15,000** American cancer deaths.[25] Critics claim this number grossly understates the actual number of cancer deaths.[26-28]

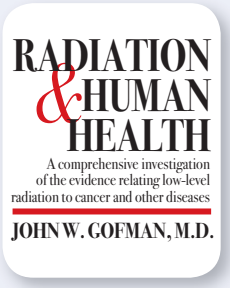

Operation Teapot Nuclear Test

PHOTO COURTESY OF NATIONAL NUCLEAR SECURITY ADMINISTRATION / NEVADA SITE OFFICE

In the **May 2002** edition of ***Life Extension***® magazine, I wrote a tribute to **Linus Pauling** for his intellect and courage to challenge the federal government's claim that radioactive fallout was "safe."[29] Dr. Pauling endured endless persecution from government authorities for daring to interfere with the above-ground testing of nuclear bombs. Our government viewed Linus Pauling as a "communist," when this Nobel Prize-winning scientist was only seeking to protect Americans from the cancers he suspected would be caused by the radioactive fallout.


Linus Pauling

Dr. Pauling's tireless efforts eventually resulted in a ban against above-ground nuclear testing by both the United States and Russia, leading him to win his second Nobel Prize.[30]



Linus Pauling is the only person to ever win two undivided Nobel Prizes. *New Scientist* magazine ranks Dr. Pauling as one of the 20 greatest scientists to ever live, an honor shared with such figures as Albert Einstein, Charles Darwin, and Isaac Newton.[31]

Yet here we are in **2015**, and most of the medical establishment remains oblivious to the documented dangers of radiation-emitting imaging devices. This is despite irrefutable data provided by the late physician-scientist **John Gofman**, **MD**, **PhD**, who worked at the Los Alamos lab inventing nuclear weapons, went on to discover the existence of LDL cholesterol, and then campaigned relentlessly to limit unnecessary exposure to medical sources of ionizing radiation.[32-37]

John Gofman called me long ago and expressed gratitude that **Life Extension** regularly warned of the dangers posed by radiation-emitting medical imaging devices. He regretted so few doctors paid attention to the many books he authored documenting higher cancer rates in those exposed to medical radiation.

Modern dental X-rays emit less radiation than older devices, and thus may not pose as great a risk for meningioma. However, the authors concluded their **2012** study by warning:

"…there is little evidence to support the use of dental X-rays 'in search of occult pathoses in the asymptomatic patient' or 'routine dental radiographs at preset intervals for all patients. Although dental X-rays are an important tool in well-selected patients, efforts to moderate exposure to ionizing radiation to the head is likely to be of benefit to patients and health care providers alike.'"[38]

Said differently, these authors are suggesting that one minimize the number of dental X-rays they are exposed to, which contradicts what is being done in most dentist practices today.

Reducing And Repairing DNA Damage Inflicted By Radiation

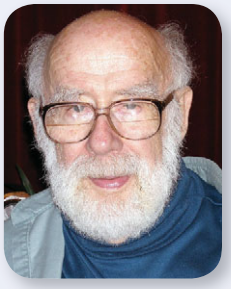
When I reviewed the number of previous articles we have published about the dangers of ionizing radiation from medical imaging tests and CT scans, I was startled by how much hard data we had uncovered.

Some of our articles describe the potential protection one might obtain by having high doses of specific antioxidants in their body at the time a radiation-emitting imaging procedure is performed.[39] Other articles describe the potential for nutrients like **blueberry extract** to enhance **DNA repair** so that damage inflicted by medical radiation does not lead to future cancer.[40]

Some of you might remember an article I wrote last year about a strain of bacteria that was made resistant to **1,000 times** the amount of radiation that would kill a human. The mechanism that enabled these bacteria to survive this onslaught of radiation-induced free radical attack was markedly enhanced **DNA repair**.[41,42]

The data about the radiation-protecting effects of the nutrients that many of you take daily continues to grow. This means that even if you have needed a CT scan or diagnostic X-ray procedure in the past, if you had these nutrients in your body, you may have gained some degree of protection. Regular intake of **blueberry** and other plant extracts may have facilitated enough **DNA repair** to offset

Tribute To Hero Who Uncovered Dangers Of CT-Scans And X-rays



BY ILYAV (TALK) - I (ILYAV (TALK))

John Gofman, MD, PhD

John Gofman, **MD**, **PhD**, was a medical doctor, nuclear chemist, **Manhattan Project** scientist, co-discoverer of isotopes of uranium and protactinium, the first to separate plutonium in usable quantities, and an early member of the **Life Extension Foundation**.

Dr. Gofman fought to end policies that allow plutonium and other radioactivity from the nuclear power/weapons fuel chain to be dispersed into the environment. He repeatedly stood up to government pressure to suppress the truth about radiation health dangers.

Dr. Gofman's accomplishments extend to his groundbreaking research in cardiac medicine, which includes the identification and distinguishing of **HDL** cholesterol and **LDL** cholesterol. The ***Journal of Clinical Lipidology*** named him the "**Father of Clinical Lipidology**," honoring him for discoveries he made decades ago, which are now part of conventional cardiology.[43]

His tireless work to reduce unnecessary radiation exposure from medical procedures is finally taking hold with ***Consumer Reports*** disseminating data that emanated from work that Dr. Gofman initiated many decades ago.

Dr. Gofman firmly believed there is no safe threshold of ionizing radiation one should needlessly be exposed to. He used a linear no-threshold model of radiation risk and argued that far more cases of cancer and other diseases are caused by unnecessary exposure to medical radiation than what the "authorities" admit.[44,45]

Not everyone agrees with Dr. Gofman's "***linear model of radiation risk***" and a debate continues as to whether there is a low level of X-ray exposure that can be accepted as "safe."

Next time you review your blood test results and see **LDL** and **HDL**, remember it was **Dr. Gofman's** pioneering research in the **1950s** that led to these lipids being included in standard **blood test** panels to evaluate vascular disease risk.

To read more about this brilliant physician-scientist, just type **John Gofman** into **Google**.

the known carcinogenic effects of the radiation. No one knows for certain.

In this month's issue, we describe some nutrients you want to have in your body ***prior*** to being exposed to a radiation-emitting imaging procedure.

I want to again thank ***Consumer Reports*** for disseminating information that is almost identical to what we've been preaching for decades. While the mainstream media ignores most of what we publish, the ***Consumer Reports*** article generated press coverage that I believe will spare some humans from medical radiation-induced cancers.

For longer life,

William Faloon

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Radiation Dose Comparison

Different types of medical diagnostic imaging tests pose varying degrees of risk from ionizing radiation exposure. A brief list of different medical diagnostic imaging tests that utilize ionizing radiation are provided to better identify scans that generate relatively high exposure in comparison to natural background radiation exposure.

Diagnostic Procedure	Typical Effective Dose (mSv)[46]	Number Of Chest X-rays (PA film) For Equivalent Effective Dose[47]	Time Period For Equivalent Effective Dose From Natural Background Radiation[48]
Chest X-ray (PA Film)	0.02	1	2.4 days
Skull X-ray	0.1	5	12 days
Lumbar Spine	1.5	75	182 days
Intravenous (IV) Pyelogram	3	150	1.0 year
Upper GI Exam (Barium Swallow)	6	300	2.0 years
Lower GI Exam (Barium Enema)	8	400	2.7 years
CT Head	2	100	243 days
CT Abdomen	8	400	2.7 years

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48. Based on the assumption of an average "effective dose" from natural background radiation of 3 mSv per year in the United States.

Fat-Soluble Nutrients *Missing* From Most Multi-Vitamin Formulas

Life Extension®'s **Health Booster** is a **cost-effective** formula that combines a **variety** of valuable nutrients in just one softgel. **Once-Daily Health Booster** provides the following nutrients:

Vitamin K1 is found in plants. It is often bound to plant fiber and requires intestinal conversion to transform into bioactive active **vitamin K2**.[1-3] Data supports value of K1 in addition to the K2 forms.[4-7]

Vitamin K2 is the active form that keeps calcium in bone and out of arteries. **MK-4** is rapidly absorbed,[1,8-9] while **MK-7** provides 24-hour bioavailability of vitamin K2.[9]

***Trans*-zeaxanthin**, **meso-zeaxanthin**, and **lutein** supports eye health and healthy vision.

Gamma tocopherol is a form of vitamin E that quenches the damaging ***peroxynitrite*** free radical.[10-11] Those who take ***alpha***-tocopherol should also take ***gamma*** tocopherol.

Blueberry extract boosts DNA function and sustain healthy blood sugar levels already within normal range.[12,13]

Sesame lignans increases tissue levels of **gamma tocopherol**, which plays a pivotal role in quenching certain kinds of inflammation.[14]

Lycopene supports prostate health, protect against free radical activity, and guard against LDL oxidation.[15,16]

Chlorophyllin offers protection against environmentally induced DNA damage from toxins like smoke, emission particles, and foods cooked at high temperatures.[17]

Black currant extract (C3G) anthocyanins promotes eye health and help ease eye fatigue.[18]

Vitamin B12 helps maintain a healthy nervous system and metabolism.[19] Vitamin B12 levels decrease with age.[20]

Each Bottle Of Health Booster Lasts Two Months

Super Cost Effective!

Just one softgel of the new **Health Booster** taken with a meal provides optimized potencies of **fat-soluble** vitamins, carotenoids, and other plant extracts. If these nutrients were taken separately, one would have to swallow many capsules and spend **2-3 times** more money.

To order **Once-Daily Health Booster**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Once-Daily Health Booster

Item #01981 • 60 softgels (two-month supply)

	Retail Price	Your Price
1 bottle	$52	**$39**
4 bottles		**$36 each**

One daily Health Booster softgel provides:

Vitamin K1	**1,000 mcg**
Vitamin K2 (MK-4)	**1,000 mcg**
Vitamin K2 (MK-7)	**200 mcg**
Vitamin B12	**300 mcg**
Chlorophyllin	**100 mg**
Gamma E Mixed Tocopherols	**359 mg**
Gamma tocopherol 197.45 - 269.25 mg	
Delta tocopherol 71.8 - 107.7 mg	
Alpha tocopherol 30.52 - 43.08 mg	
Beta tocopherol < 17.95 mg	
MacuGuard® Carotenoid Phospholipid Blend	**145 mg**
Phospholipids, marigold extract (flower) [providing 10 mg free lutein, 4 mg meso-zeaxanthin & trans-zeaxanthin]	
C3G (Cyanidin-3-glucoside) [from European black currant extract (fruit)]	**2.2 mg**
Lycopene (tomato extract)	**10 mg**
Sesame Seed Lignan Extract	**20 mg**
Wild Blueberry Whole Extract (fruit)	**100 mg**

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Contains soybeans.

Caution: if taking anticoagulant or antiplatelet medication, consult your health care provider before taking this product.

Blueberry Extract
Boosts DNA Function

Studies show that blueberries delay the aging process through a variety of mechanisms, including **maintaining healthy DNA structure** and favorably modulating **genes** associated with aging.[1,2]

Chockfull of **anthocyanins**, the **blueberry** provides health-boosting benefits shown to:

- Enhance heart health[3]
- Maintain brain function[4,5]
- Sustain healthy blood sugar levels already within normal range[6]
- Support smooth firm skin[7]
- Maintain a healthy weight[8] and stable cholesterol levels already within normal range[9]

Blueberry extract is even more potent than the whole berry or juice, providing greater metabolic support throughout the entire body and without the excess sugar of raw fruit.[10] Life Extension®'s **Blueberry Extract Capsules** consists of only concentrated **extracts** from **wild blueberries**, which possess up to **10 times** the antioxidant capacity of cultivated berries.

Blueberry Extract Capsules

Item #01214 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	$22.50	**$16.88**
4 bottles		**$15 each**

Suggested dose is one capsule daily, for most individuals.

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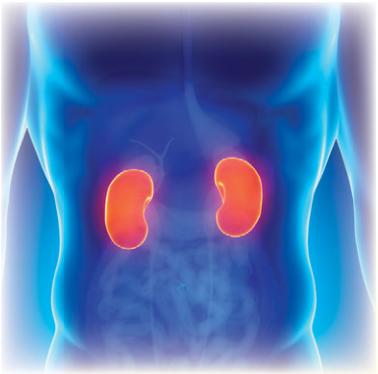
Non-GMO

To order **Blueberry Extract Capsules**, call **1-800-544-4440** or visit **www.LifeExtension.com**

IN THE NEWS

NSAIDs Increase Kidney Disease Risk

A study published in the journal *Hypertension* found that those with high blood pressure who regularly take nonsteroidal anti-inflammatory drugs (NSAIDs) have an elevated risk of developing chronic kidney disease.*



While some previous studies have linked NSAIDs to diminished kidney function, the outcome often ignored those who already had hypertension, which itself carries an increased risk for kidney damage.

After examining the data of over 30,000 patients with high blood pressure, researchers at the Institute of Population Health Sciences, National Health Research Institutes in Zhunan, Taiwan, found that those who'd been taking NSAIDs for at least three months were **32%** more likely to have chronic kidney disease than those who didn't take NSAIDs. Those who used NSAIDs more than once a day had a **23%** greater risk of developing chronic kidney disease than people who didn't.

Even taking NSAIDs for less than three months increased the risk of developing chronic kidney disease by **18%**.

"Physicians should exercise caution when administering NSAIDs to people with hypertension and closely monitor renal function," said senior study author Hui-Ju Tsai.

Editor's Note: Taking NSAIDs may cause the kidneys to retain salt and water, increasing blood pressure and potentially making medications that lower hypertension ineffective.

* *Hypertension.* 2015 Sep;66(3):524-33.

Higher Vitamin D Levels And Lower Risk Of Colorectal Adenoma

The *World Journal of Gastroenterology* reported the results of a case-control study and meta-analysis which both found a lower risk of colorectal adenoma (polyps) in association with higher serum **vitamin D** levels.*

Researchers conducted a matched case-control study that included 112 Korean men and women with colorectal adenomas and 112 controls who underwent colonoscopy between August 2011 and September 2012. An association between higher vitamin D levels and a reduced risk of adenoma was found in women.

For the meta-analysis, 15 studies involving Western as well as Asian populations that examined serum or plasma vitamin D levels and the risk of colorectal adenoma were selected. The combined studies included 5,454 subjects with colorectal adenomas and 6,656 controls. When highest to lowest categories of vitamin D were compared, a **32%** average reduction in the risk of adenoma was uncovered in the ***highest*** vitamin D group.

Editor's Note: While many adenomas remain benign, some are a precursor to colorectal cancer, one of the more common human malignancies.

* *World J Gastroenterol.* 2015 Aug 7;21(29): 8868-77.

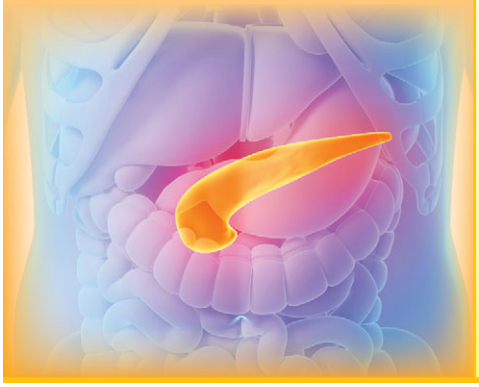
Metformin Plus Aspirin Inhibit Pancreatic Cancer

A recent study published in *Oncotarget* investigated the effects of **metformin** and aspirin, alone and in combination, on pancreatic cancer cell lines.* In a xenograft mouse model, the scientists demonstrated that the metformin/aspirin combination inhibited pancreatic tumor growth. For the study, randomized mice with tumors were injected with **200 mg/kg** metformin, **60 mg/kg** aspirin, or both three times a week for 28 days.

The researchers found that metformin combined with aspirin, at relatively low concentrations, demonstrated a synergistic effect on cell proliferation. Compared to each drug alone, the combination had significantly stronger effects on the inhibition of colony formation and cell migration, as well as the modulation of key molecular targets in **AMPK** and other signaling pathways. Furthermore the combination led to apoptosis through downregulation of anti-apoptotic proteins and the upregulation of pro-apoptotic proteins.

Editor's Note: "At the cellular level, metformin stimulates AMPK activation by disrupting mitochondrial respiratory chain complex I and decreasing ATP synthesis," say study authors. "Recently, aspirin was also shown to inhibit the dephosphorylation of AMPK thus activating AMPK."

* *Oncotarget*. 2015 Aug 28;6(25):21208-24.



Calorie Restriction Lowers Risk Of Age-Related Diseases

A two-year study supported by the National Institutes of Health found that calorie restriction lowered certain risk factors of age-related diseases.* In the study, published in the *Journal of Gerontology*, 218 healthy normal-weight and moderately overweight men and women were randomized to a reduced-calorie diet that was **25%** below their normal calorie consumption. The calorie restriction group was given a weight-loss target of **15.5%** in the first year and weight stability over the second year. Weight loss was expected to be achieved by reducing calorie intake **25%** below their regular intake at baseline. The other participants maintained their regular baseline diets over the course of the study.

Although the weight loss by the calorie restriction group was the largest sustained weight loss reported in any clinical trial of nonobese participants, weight loss fell short of the target. The intervention arm only reached **12%** caloric restriction instead of the trial's **25%** goal but did maintain calorie restriction over the two-year period.

Calorie restriction significantly reduced several predictors of cardiovascular disease compared to the control group, including decreasing total cholesterol by **6%**, increasing HDL levels, and lowering average blood pressure by **4%**. Calorie restriction led to a **47%** reduction in levels of **C-reactive protein** and markedly decreased **insulin resistance**.

Editor's Note: "It's important to find out whether these reductions would yield long-term benefits," said NIH director and paper author Dr. Evan Hadley. "It also would be useful to discover if calorie restriction over longer periods has additional effects on predictors of health in old age, and compare its effects with exercise-induced weight loss."

* *J Gerontol A Biol Sci Med Sci.* 2015 Sep;70(9):1097-104.

Nutrients Reduce Aging Of Thymus

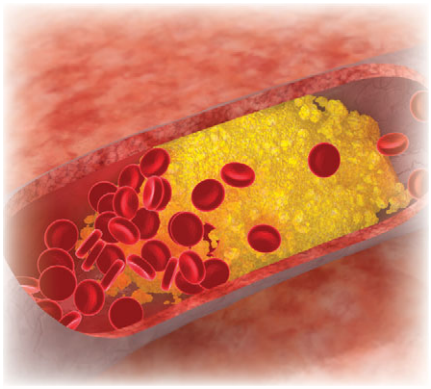
An article appearing in *Cell Reports* describes a role for nutrients in slowing aging of the thymus, a gland responsible for the production of immune cells known as T lymphocytes. The thymus reaches its peak size at adolescence and subsequently begins to atrophy.*

The researchers examined gene activity in the thymus' stromal (connective tissue) cells and lymphoid cells. They discovered that stromal cells were deficient in the body's enzyme catalase, making them subject to increased damage from reactive oxygen species.

To help confirm the benefit of this nutrient protection, mice were provided with drinking water enhanced with the nutrients N-acetylcysteine or vitamin C from the time of weaning. In comparison with mice that received plain water, thymus glands from mice that received either nutrient were larger after 10 weeks than those of control animals of the same age.

Editor's Note: In another experiment, mice that were genetically modified to overexpress mitochondrially targeted catalase had thymus glands that were significantly protected from thymus atrophy at six months of age compared to those of normal control animals.

* *Cell Rep.* 2015 Aug 18;12(7):1071-9.



Alpha-Lipoic Acid Prevents Atherosclerosis

An article published in *Cell Reports* reveals a protective effect for supplementation with alpha-lipoic acid on telomere length and vascular health in mice given a high-fat diet.*

"The effects of chronic diseases such as atherosclerosis and diabetes on blood vessels can be traced back to telomere shortening," noted senior author R. Wayne Alexander, MD, PhD.

Previous research, reported in the journal *Circulation*, found an inhibitory effect for lipoic acid against high-fat diet-induced atherosclerosis in mouse models of the disease. In the current report, Dr. Alexander and colleagues confirmed that alpha-lipoic acid stimulates peroxisome proliferator-activated receptor gamma co-activator 1-alpha (PGC1-alpha), which is known to control some aspects of how muscles respond to exercise. "What's new here is that we show that PGC1-alpha is regulating telomerase, and that has real beneficial effects on cellular stress in a mouse model of atherosclerosis," first author Shiqin Xiong stated.

Editor's Note: Telomeres are segments of genetic material that cap and protect the ends of chromosomes. Aging-associated reduction in telomere length is considered a marker and cause of cellular aging. Telomere length is maintained by an enzyme known as telomerase. While telomerase is activated in proliferating cells, including those which are cancerous, Dr. Alexander's team has not observed an increased incidence of malignancies in animals that received alpha-lipoic acid.

* *Cell Rep.* 2015 Sep 1;12(9):1391-9.

Diet Alone Fails To Provide Vitamin E

The journal *PLOS One* published findings derived from NHANES data that reveal a high prevalence of suboptimal alpha-tocopherol (vitamin E) levels among subjects for whom food alone was their only source of the vitamin.*

Michael I. McBurney and associates analyzed information from 7,922 NHANES participants with available measurements of serum alpha-tocopherol. A striking **87%** of subjects aged 20 to 30 years and **43%** of those aged 51 years and older had vitamin E levels lower than **30 micromoles per liter**, which was categorized as inadequate based on Estimated Average Requirement and the individuals with the lowest mortality rates in the Alpha-Tocopherol Beta-Carotene study. Serum alpha-tocopherol levels among subjects whose only source of vitamin E was food were below adequate levels on average, at **24.9** micromoles per liter. In comparison, those whose vitamin E was derived from both food and supplements had an average level of **33.7 micromoles per liter**.

Editor's Note: "We propose that for many Americans, especially those relying exclusively upon food sources, that serum alpha-tocopherol concentrations may not be adequate," Dr. McBurney and colleagues write.

* *PLoS One.* 2015 Aug 19;10(8):e0135510.

Vitamin D Helps The Homebound

An article published on August 16, 2015, in the *Journal of the American Geriatrics Society* reports a successful outcome for home delivery of a **vitamin D** supplement to older individuals in Forsyth County, North Carolina.*

The study included 68 homebound Meals-on-Wheels participants. Subjects received a supplement providing **100,000 IU** vitamin D or a placebo delivered with their meal once per month for five months. Serum 25-hydroxyvitamin D levels were assessed at the beginning and end of the study.

While **57%** of subjects had serum vitamin D levels of less than **20 ng/mL** prior to treatment, just one of 34 participants who received vitamin D3 had levels that were this low after five months, in comparison to 18 of the 34 participants randomized to the placebo group. After adjustment for several factors, a lower rate of falls was found among those randomized to vitamin D3 in comparison with the placebo group.

Editor's Note: Improved vitamin D status could aid in the prevention of falls that can be a complication of muscle weakness, osteoporosis, or impaired balance and/or vision that may occur in older men and women.

* *J Am Geriatr Soc.* 2015 Aug 16.

Symposium Highlights Coffee's Cardiovascular Benefits

Findings from studies presented at a Satellite Symposium on Coffee and Cardiovascular Disease Mortality held during the European Association for Cardiovascular Prevention And Rehabilitation's 2015 Congress add evidence to an association between drinking coffee and a reduced risk of cardiovascular disease and related mortality.*

Most notable were the results of a meta-analysis published in the *American Journal of Epidemiology* which concluded that, compared to not drinking coffee, consuming three cups per day was associated with up to a **21%** reduction in the risk of dying from cardiovascular disease among 997,464 subjects. For all-cause mortality, the greatest protective effect was found in association with four cups daily. Another meta-analysis published in 2014, which appeared in *Circulation*, suggests that an optimal amount for protection against cardiovascular disease is three cups per day.

Coffee drinking has also been associated with protection against diabetes, a disease that significantly increases cardiovascular disease risk.

Editor's Note: Protective mechanisms for coffee against the risk of cardiovascular mortality remain uncertain; however, the beverage's antioxidant and anti-inflammatory effects are likely to play a role.

* European Association for Cardiovascular Prevention & Rehabilitation's 2015 Congress. 2015 May 14.

Exciting Advances Regarding Metformin And Breast Cancer Prevention

Exciting advances in breast cancer prevention were made in 2015, with the focus on the diabetes drug ***metformin***.[1-4] A clinical trial demonstrated that metformin can reduce proliferation of some types of breast cancer cells by over **60%**, compared with placebo.[1]

There are three key pieces of evidence that explain why an antidiabetic drug would be an effective cancer preventive agent.

1. Insulin resistance increases risk for breast cancer and worsens prognosis. Metformin reduces insulin resistance.[5-7]
2. Obese people are at higher risk for different types of cancers including breast cancer.[8] Metformin fights obesity.[9-11]
3. High levels of insulin promote tumor formation.[12] Metformin counteracts insulin resistance.[5,10]

And large-scale studies have shown substantial reduction in cancer rates and deaths (especially for breast cancer) among diabetics using metformin.[13]

One exciting finding is that metformin activates a "master signaling molecule" called **AMPK**.[1] AMPK is involved and plays an important role in systemic energy balance, insulin signaling, and the metabolism of glucose and fats.[14]

Another of metformin's mechanisms is its unique ability to change cancer cells' metabolism. Studies show that this effect promotes killing of cancer stem cells in breast, prostate, colon, and brain cancers by producing an energy crisis in these rapidly dividing cells.

Metformin has been shown to induce cell death by energy starvation in breast cancer stem cells. This effect made the otherwise treatment-resistant stem cells highly vulnerable to standard chemotherapy.[4] Chemotherapy works by inducing DNA damage in stem cells, and metformin blocks the normal DNA repair mechanisms by reducing available energy levels.[4]

While promising, these studies require validation from a controlled human trial. Such a study was recently conducted among a group of 200 women scheduled for surgery to remove invasive breast cancer lesions. Subjects were assigned to receive a placebo or metformin at **1,700 mg** daily for four weeks preceding their surgery. At surgery, biopsies were taken to determine the effects of metformin. The researchers used a known marker of cancer cell proliferation, a protein called **Ki-67**, to detect evidence of cell replication, which would be evidence of cancerous progression.[15]

The study found that proliferation of cells in the precancerous lesions called ***ductal carcinoma in situ*** (DCIS) among metformin recipients was reduced compared with that in placebo patients in the group of women with several known markers of aggressive breast cancer including the cancer growth factor ***human epidermal growth factor receptor 2*** (HER2), a marker of aggressive cancer seen in **20-30%** of breast cancer victims).[16] and the estrogen receptor molecule expressed on the precancerous cells.[1]

Women with DCIS and HER2 had a **40%** reduction in cell proliferation, while those who had both HER2 and estrogen receptor markers had over **60%** reduction in proliferation.[1]

These most recent findings add to the evidence base that favors use of metformin in cancer-prevention efforts. The metformin story is a classic example of how closely related all of our bodies' metabolic systems are to one another, and how simple preventive approaches trump complex "designer drugs" aimed at fixing problems after they arise.

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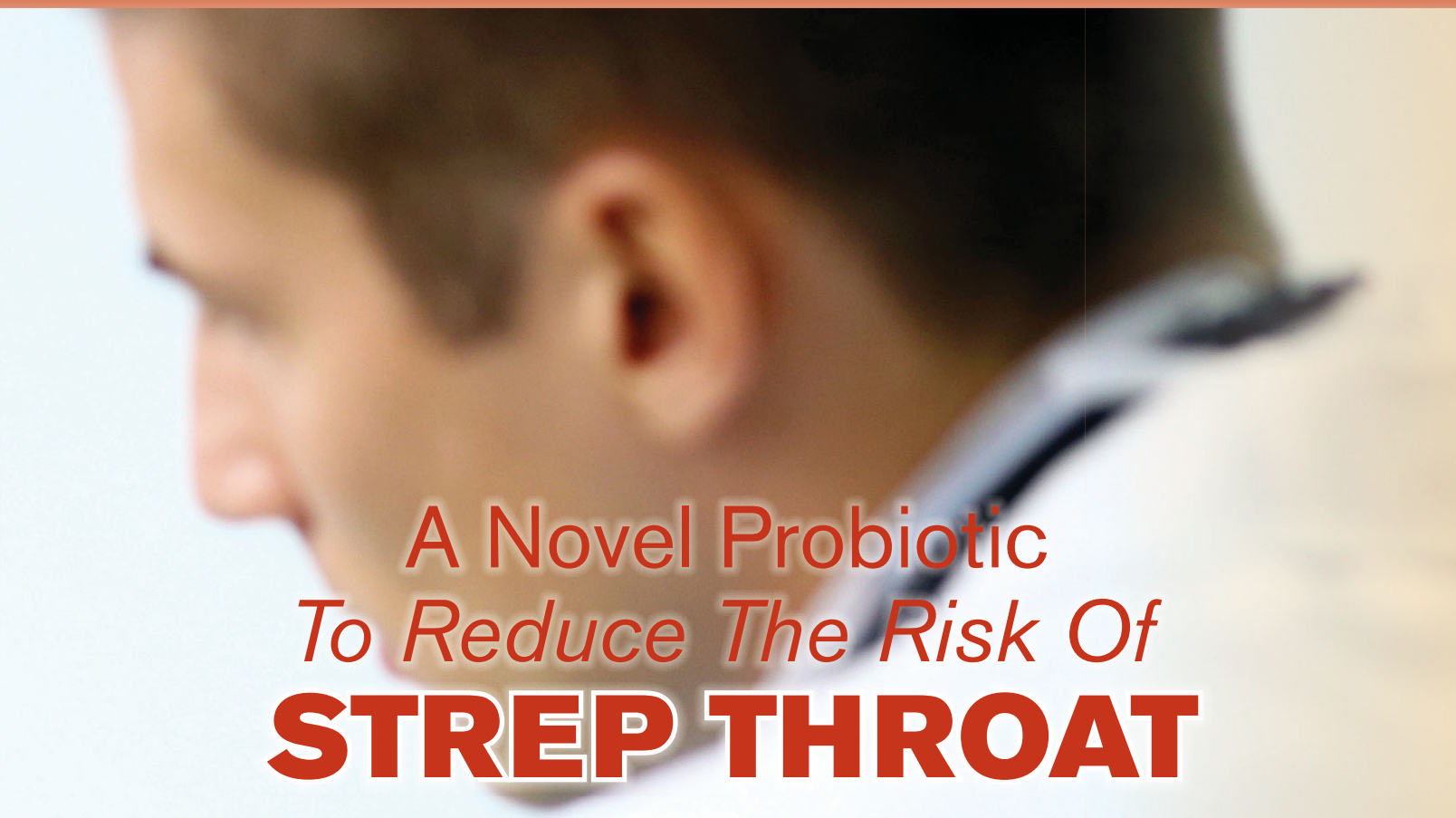


A Novel Probiotic *To Reduce The Risk Of* STREP THROAT

Strep throat (known to physicians as ***streptococcal pharyngitis***) is caused by a group of bacteria known as **type A streptococcus**. Responsible for up to about **15%** of sore throat infections in adults and up to about **30%** in children, ***strep throat*** is characterized commonly by fever, painful swallowing, and tender, enlarged lymph nodes in the neck.[1]

Although most of the time in adults the cause of a sore throat is ***viral*** in origin, and therefore antibiotics are of no use, in the case of confirmed **strep throat**, antibiotic treatment is important to prevent dangerous consequences, like ***rheumatic heart disease*** or ***retropharyngeal abscess***.[1,2]

At a time when antibiotics were not available, many people suffered as a consequence of inadequate treatment of **strep throat.**

While antibiotic treatment of confirmed **strep throat** is important to prevent the potential for rheumatic heart disease and other complications, an opportunity exists to *reduce the risk of strep infection in the first place*.

The intriguing news is that scientists have identified a **novel probiotic**, known as ***S. salivarius* K12**, and studies suggest that this targeted probiotic lozenge may reduce the risk of **strep throat**. In addition, this **probiotic** also appears capable of reducing the incidence of non-strep, ***viral*** sore throats as well.

Sore Throats: Significant Adult Problems

There are few "minor" illnesses as irritating as a **sore throat.**

Unfortunately**,** there's no good way to discern whether an infectious sore throat is caused by a **bacteria** or **virus** based solely on clinical symptoms in isolation. Sore throat caused by a potentially dangerous organism like ***Streptococcus pyogenes*** (strep throat), however, tends to be more severe, and accompanied by (high) fever, but not always.[1]

In the majority of cases a sore throat is caused by a **virus**.[3]

Antibiotics are of no use in viral infections. Unfortunately, overprescribing antibiotic treatment in the face of any sore throat continues, though to a lesser degree over the past several years since most physicians and patients are aware of the unnecessary problems antibiotics cause.[4]

Bacterial infection with pathogenic organisms like *Streptococcus pyogenes* is the only real indication for antibiotic use. This particular organism produces a painful sore throat ("strep throat") that can last three to five days, and can also cause long-term complications such as rheumatic heart disease, retropharyngeal abscess, and post-streptococcal glomerulonephritis (kidney disease).[1,2] These conditions are rare today in comparison with the era prior to antibiotics, but concerns remain high, with overprescribing of antibiotics a consequence.[3]

Overprescribed antibiotics are a known public health problem, particularly in adults with upper respiratory tract infections such as sore throat.[5,6] These practices contribute to the emergence of "superbugs" that are difficult to treat and have the potential to produce dangerous infections.[7-9] And indiscriminate antibiotic use also creates problems by producing an imbalance of the gastrointestinal (GI) microbiome, the population of healthy organisms that lives in our GI tract and has tremendous impact on overall health.[10]

And because it is impossible to tell at home if a sore throat is caused by strep, many people with sore throats visit their physicians, and research suggests that potentially up to **75%** of adult patients receive antibiotic treatment for what ultimately turns out to be nonbacterial in origin.[3]

What this all adds up to is that we need a way to reduce the risk of any kind of sore throat in adults. That will help reduce the incidence of genuine, antibiotic-requiring cases of sore throat caused by bacteria, such as strep throat, and also minimize the number of physician visits for sore throat that might result in inappropriate antibiotic prescribing.

And that's where the beneficial, probiotic ***S. salivarius* K12** comes in, as we'll now see.

Novel Probiotic Fights Strep

There is a new method for fighting and reducing the risk of strep throat infection.

The beneficial *S. salivarius* probiotic strain was discovered in the 1980s in cultures from individuals who seemed resistant to developing sore throats.[12,13] That search yielded a specific strain of *S. salivarius* called **K12**, which is found in only about **2%** of individuals who show a natural resistance to strep throat.[14] With sufficient numbers of this bacterial strain, it can keep disease-causing organisms such as *Streptococcus pyogenes* under control.[12,15]

One of its key properties is that *S. salivarius* K12 produces compounds called ***lantibiotics***.[16] These lantibiotics strongly inhibit many strains of disease-producing *Streptococcus pyogenes* responsible for causing strep throat in humans.[15] As a result, disease-causing organisms may be prevented.

Salivaricin A2, a type A lantibiotic produced by *S. salivarius* K12, works like a drill that forms molecular pores in the membranes of target organisms, permitting them to leak out their contents into surrounding fluid and then break apart and die.[15-19]

But that's not where the benefits of *S. salivarius* K12 end. While the mechanisms are still being investigated, there is now evidence that *S. salivarius* K12 colonization of the throat reduces secretion of the inflammatory signaling molecule (cytokine) ***IL-8***, and increases concentrations of the antiviral compound ***interferon-gamma***.[18] These properties may account for observation that children treated with *S. salivarius* K12 had a significant reduction in both viral and bacterial sore throats.[18]

Clinical Evidence

A growing body of evidence demonstrates the effectiveness of the probiotic *S. salivarius* K12 in helping to reduce the risk of sore throats of all kinds.

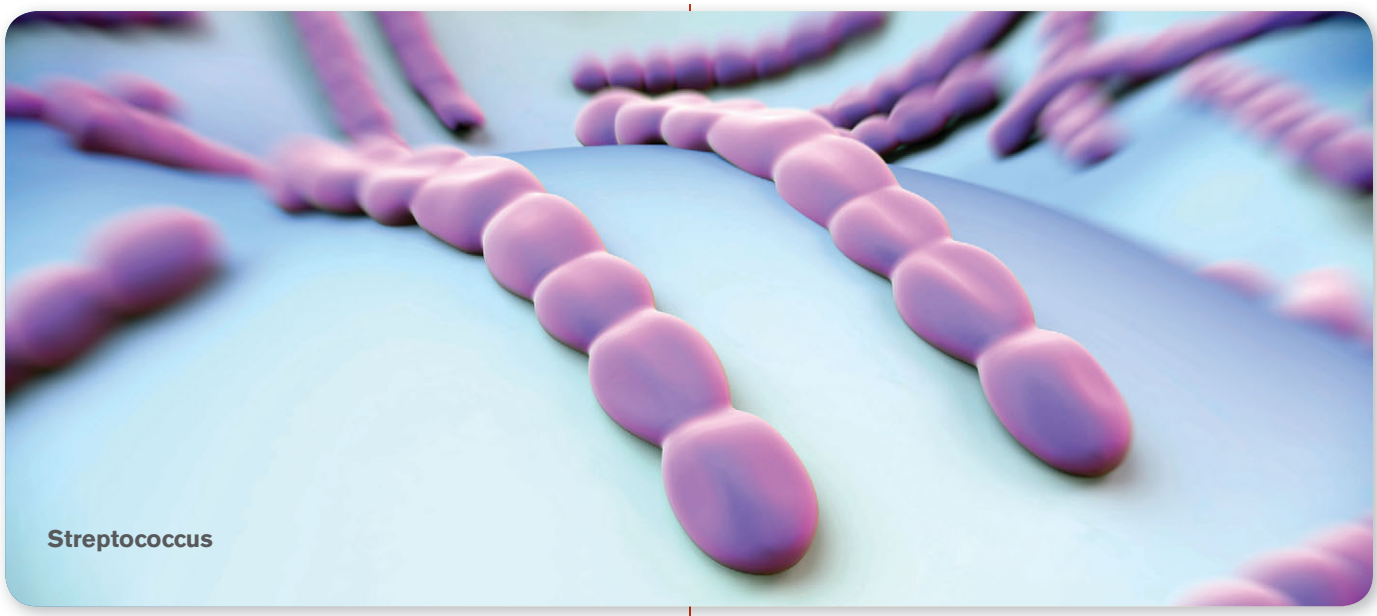
A randomized, controlled clinical trial was performed among a group of adults to determine the effects of *S. salivarius* K12 oral therapy on the number and severity of episodes of proven strep throat. Subjects were people with a history of recurrent strep throat or tonsillitis (four or more proven episodes in the preceding year).[21]

Subjects were free of symptoms at enrollment in the study. They were started on either a daily lozenge containing *S. salivarius* K12 organisms, or given no treatment. Treatment was given daily for 90 days. Subjects were then followed for an additional six months with no further treatment.

What You Need To Know

Stop Sore Throats Without Dangerous Drugs

- **Sore throats are a major problem in adults as well as children.**
- **Even strep throat, considered a "childhood illness," is known to occur in adults, though less frequently.**
- **While most sore throats are caused by viruses and are merely uncomfortable, strep throat can produce dangerous complications like rheumatic heart disease, retropharyngeal abscess, and kidney disorders.**
- **Instead of waiting for a sore throat to develop and taking your chances with or without antibiotics, you can proactively work to prevent sore throats of all kinds, including potentially dangerous strep.**
- **Probiotic bacteria *S. salivarius* K12 produces potent, locally acting *lantibiotics*, compounds that target the organisms that cause strep throat.**
- **Clinical studies demonstrate a significant reduction in strep throat infections in people supplementing with this probiotic in the form of a daily oral lozenge.**
- **Remarkably, studies also show that *S. salivarius* K12 contributes to a reduction in viral sore throats as well. This property is attributed to the probiotic's impact upon certain signaling molecules (cytokines), including interferon-gamma.**
- **Regular use of probiotic *S. salivarius* K12 may help you dodge the upcoming winter sore throat season.**


Streptococcus

Treated adults who completed the 90-day course of supplementation had a significant **84%** reduction in their incidence of strep throat or tonsillitis compared with the previous year.

Even during the six-month, no-treatment follow-up period, patients who underwent the original 90-day supplement experienced a significant **62%** reduction in episodes of strep throat or tonsillitis, compared with the untreated group.

This study therefore demonstrated that ***preventive*** treatment with *S. salivarius* K12 was effective at significantly reducing the rates of recurrent strep disease. That's a first.

In a similar study targeting school-age children with recurrent strep infections, treatment with *S. salivarius* K12 was given for 90 days.[22] Again, the subjects were followed for six additional months after the supplementation period.

At the 90-day mark, supplemented children demonstrated a **92%** reduction in strep throat, compared with the previous year. Again, there was a significant reduction (this time **66%**) in the rate of strep throat infections in the six months following the end of the supplementation period.[22]

In an important additional finding, the rate of acute ear infections in this group of children was also significantly reduced by about **40%** in the supplemented group, compared with the previous year.[21] This suggests that not only *Streptococcus pyogenes*, but also potentially other disease-causing organisms, are susceptible to this preventive treatment.

In a third study, children with recurrent strep throat were supplemented for 90 days with *S. salivarius* K12 (**1 billion organisms** per lozenge), or given no therapy.[18]

Supplemented children showed a significant **97%** reduction in strep throats, from a baseline of 3.1 infections per child in the year prior to the study to just 0.1 infection per child in the year of the study, with no significant change seen in the unsupplemented group.[18]

Remarkably, the supplemented patients also had a significant (and unprecedented) **80%** decrease in the incidence of oral and throat ***viral*** infections. The researchers speculated that this reduction might be related to a known ability of *S. salivarius* K12 to reduce inflammatory **IL-8** and increase anti-viral **interferon-gamma**.[18,23]

Summary

Sore throats affect most everyone, causing loss of work, sleep, and quality of life.

Strep throats caused by pathogenic type A streptococcus bacteria strains can strike both children and adults.

The novel probiotic supplement ***S. salivarius* K12** now available in a once-daily lozenge, produces potent, natural, locally acting ***lantibiotics***, a class of compounds that may reduce the risk of throat infection.

S. salivarius K12 has now been clinically documented to reduce the incidence of **strep throat** infections in both adults and children. In an intriguing finding, people who supplemented with this probiotic also appeared to be protected against **viral** throat infections as well.

Viral infections are the leading cause of sore throats, and although viruses are unfazed by antibiotics, antibiotic treatment is often prescribed, contributing to their inappropriate use. ●

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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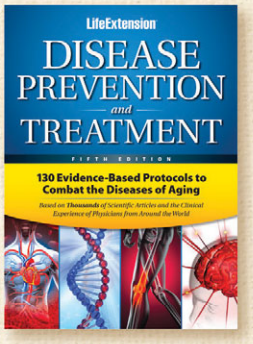

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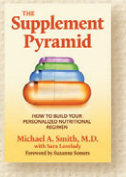

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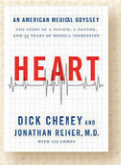

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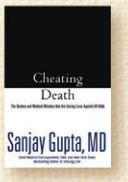

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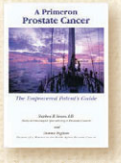

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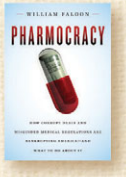

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BY MICHAEL DOWNEY

Block *Deadly Effects* Of After-Meal Blood Sugar

Diabetics and prediabetics are prone to *accelerated aging* due to the systemic damage caused by excess blood sugar. Unfortunately, as humans age, blood sugar tends to rise.[1] What researchers are discovering is that people don't have to be a diabetic to suffer from the extensive health consequences of high blood sugar.[2-9]

The problem is that after a meal, one's blood sugar (whether a person is diabetic or not) spikes and the result is the production of deadly byproducts called ***advanced glycation end products*** (AGEs).[10,11] **AGEs** are rogue molecules that damage cells, tissues, and organs.[11-13]

They also trigger inflammation and oxidation, generating even more of these molecules in a vicious, health-robbing cycle.[14]

Life Extension® has long advised customers about the importance of maintaining a fasting glucose level between **70** to **85 mg/dL**.

Compelling data now confirms that a unique form of vitamin B1 called **benfotiamine** can protect against the ravages of elevated blood sugar.[15,16]

In the process of helping neutralize the adverse impact of elevated after-meal blood glucose, **benfotiamine** can help prevent Alzheimer's disease, vision impairment, cardiovascular disease, kidney damage–*and possibly even aging itself!*[3]

Blood Sugar And Tissue Damage

The browning that takes place when foods are cooked at high temperatures (known as the ***Maillard Reaction***) is the result of a sugar-related molecular change known as ***glycation***. This damaging process takes place when a reducing sugar and an amino acid react in the presence of heat.[17,18] Put simply, the structure of normal proteins becomes *warped*.

This same dysfunctional chemical change is occurring every day *inside* the body.

Within every cell, the sugar that the body uses for fuel is busy at work at every moment reacting with proteins and fats.[17,18] The byproducts of this chemical reaction[4-7] are called ***advanced glycation end products***.[19]

Ultimately, these ***advanced glycation end products*** deactivate enzymes, disrupt cell signaling, and damage the body's DNA. This results in intracellular damage and *apoptosis* (programmed cell death),[20] inflammation,[9,21] oxidative stress,[9,22-24] nerve-cell component damage,[25] a depletion of nitric oxide[24,26] (which is vital to vascular health), and high cholesterol.[28]

These **effects** are implicated in the progression of numerous age-related diseases,[28] ranging from neuropathy[23] and vision problems[29] to kidney[30] and cardiovascular disease[24,27,31]—to ***even aging itself***.[2,32]

With advancing age, even **normal** blood sugar levels eventually trigger deadly advanced glycation end products. Studies clearly demonstrate links between major health risks and levels of AGEs in the blood of nondiabetics.[33,34]

Scientists have speculated that AGE-related changes ultimately contribute to a limitation of the human **life span**[35]—suggesting that blocking the pathways of glycation could ***extend human life expectancy***.

Supercharge The Body's Natural Defenses

One of the natural defenses against advanced glycation end products is vitamin B1, known as **thiamine**. Vitamin B1 prevents glycation molecules from becoming fully formed in the first place.[22,36]

The problem is that glucose quickly depletes the body's limited thiamine supplies.[37] And although it might seem logical to use thiamine supplements to block advanced glycation end products, that's problematic as well.

Because thiamine is ***water soluble***, it has difficulty penetrating the lipid molecules that primarily make up cell membranes. Also, the body has a very ***low*** upper-dose limit, which means that taking larger doses of thiamin wouldn't do any good because it would get excreted in the urine.[38,39] Ultimately, tissues simply can't absorb nearly enough thiamine to prevent cumulative damage caused by advanced glycation end products.[40,41]

Researchers realized there was an urgent need for a better means of delivering thiamine to the cells—and that's where the unique form of thiamine called **benfotiamine** comes in. The major difference is that **benfotiamine** is a ***fat-soluble*** derivative of thiamine. Because it is fat soluble, benfotiamine substantially *boosts* thiamine absorption into cells and throughout the body.[15,40,41]

Administration of benfotiamine resulted in a **10** to **40% higher** thiamine incorporation into the liver and heart—and a remarkable **5-** to **25-fold higher** thiamine incorporation into muscle and brain![39] A small clinical study showed that this enhanced bioavailability of benfotiamine caused it to slash the intracellular formation of AGEs in subjects' blood cells by **40%**![42]

Benfotiamine has been found to block sugar-induced damage in a number of ways:

- It activates a vital enzyme called ***transketolase***, which converts toxic glucose-induced metabolites into harmless compounds.[3,16]
- It helps prevent inflammation by inhibiting the activation of ***nuclear factor-kappaB*** (NF-kB), a trigger for dangerous inflammatory reactions in the body.[16]
- A 2012 study showed that benfotiamine boosts glucose breakdown in hyperglycemic (high-glucose) conditions by **70%** and up to **49%** in ***normoglycemic*** (normal-glucose) conditions![43]

Benfotiamine is superior to thiamine alone in mitigating the spectrum of diseases such as neurodegenerative diseases and cancer,[44] as well as the kidney, eye,

and nerve damage seen in diabetic patients.[7] Let's now examine the evidence demonstrating benfotiamine's potent protection against several of the most common *sugar-induced* disorders.

Benfotiamine *Reverses* The Pathways And Memory Loss of Alzheimer's

Recent studies have indicated that benfotiamine could potentially enhance memory and contribute to the delay in the progression of Alzheimer's disease.

When benfotiamine treatment was used for eight weeks in a mouse model of Alzheimer's disease, researchers found that it reduced both **amyloid plaque** numbers and **phosphorylated tau** protein levels in the brain. It also helped prevent amyloid plaque from forming in the first place by reducing enzyme activities related to amyloid precursor proteins.[45] These changes were validated by a dose-dependent enhancement in **memory**.[45]

The study authors concluded that *"**benfotiamine may be beneficial for clinical Alzheimer's disease treatment**."*[45]

Then in 2012, scientists determined that benfotiamine was able to do more than just **reduce** the plaque and tau formation—it could ***regress*** it. One of the ways it produced this effect was through a reduction in advanced glycation end products. The study authors wrote that *"**the use of benfotiamine could provide a safe intervention to reverse biological and clinical processes of Alzheimer's disease progression**."*[46]

Defense Against Sugar-Induced Vision Loss

The same blood sugar effects that are associated with blindness in diabetics can cause cataract and retinal damage in nondiabetics as well.[47,48] Because of its high vascularity, eye tissue is especially susceptible to damage from advanced glycation end products caused by elevated glucose levels.

In an animal study, benfotiamine supplementation was found to **reverse** retinal accumulation of AGEs, as well as increasing their urinary excretion.[49] This can lead to a number of beneficial effects on the eyes.

Elevated blood sugar and the formation of AGEs can trigger cell death within the retina. However, when researchers applied benfotiamine to retinal blood vessel cells in culture, they found that the benfotiamine was

What You Need To Know

Block The Aging Effects Of High Blood Sugar

- **Glycation—the deadly binding of sugars to proteins—produces deadly byproducts called advanced glycation end products (AGEs).**
- **AGEs damage cells, tissues, and organs, and cause premature aging.**
- **Thiamine is the body's natural defense against AGEs, but since it is *water soluble*, the body doesn't absorb it well.**
- **Benfotiamine, a *fat-soluble* derivative of thiamine (vitamin B1), substantially boosts intracellular thiamine levels, inhibiting the AGEs that cause sugar-related damage to tissue.**
- **Numerous studies demonstrate that benfotiamine blocks the pathways of Alzheimer's disease, vision loss, cardiovascular disease, and kidney damage.**
- **Benfotiamine is extremely safe and appears to slow the chronic disease and aging effects of glycation in nondiabetic as well as diabetic individuals.**

able to prevent this dangerous process. It was also able to reduce DNA damage.[50]

In the eye, advanced glycation end products increase enzymes called ***matrix metalloproteinases*** (***MMPs***). These protein-dissolving enzymes cause substantial damage to retinal tissue. Scientists found that benfotiamine lowered MMP production to normal levels and increased production of certain proteins that specifically inhibit their activity.[51]

Inflammatory changes associated with aging, elevated blood glucose, and infections can affect the eyes. Uveitis, a serious inflammation of the middle layer of the eye, is responsible for **10%** of all cases of blindness in the United States[52] and is characterized by infiltrates of white blood cells, proteins, and inflammatory cytokines that inflict oxidative stress, leading to further inflammation.[53] Benfotiamine was found to suppress this process and the expression of inflammatory marker molecules.[53]

Benfotiamine Protects Against Cardiovascular Damage

The thin layer of *endothelial* cells that lines blood vessels constantly regulates blood pressure and flow. Advanced glycation end products damage these cells, which can lead to heart attacks, heart failure, and stroke.[54,55]

Advanced glycation end products damage blood vessels in three ways:

1. They reduce endothelial cell replication, a vital process to keep arteries healthy.[56]

2. They trigger an increased level of death among endothelial cells.[57]

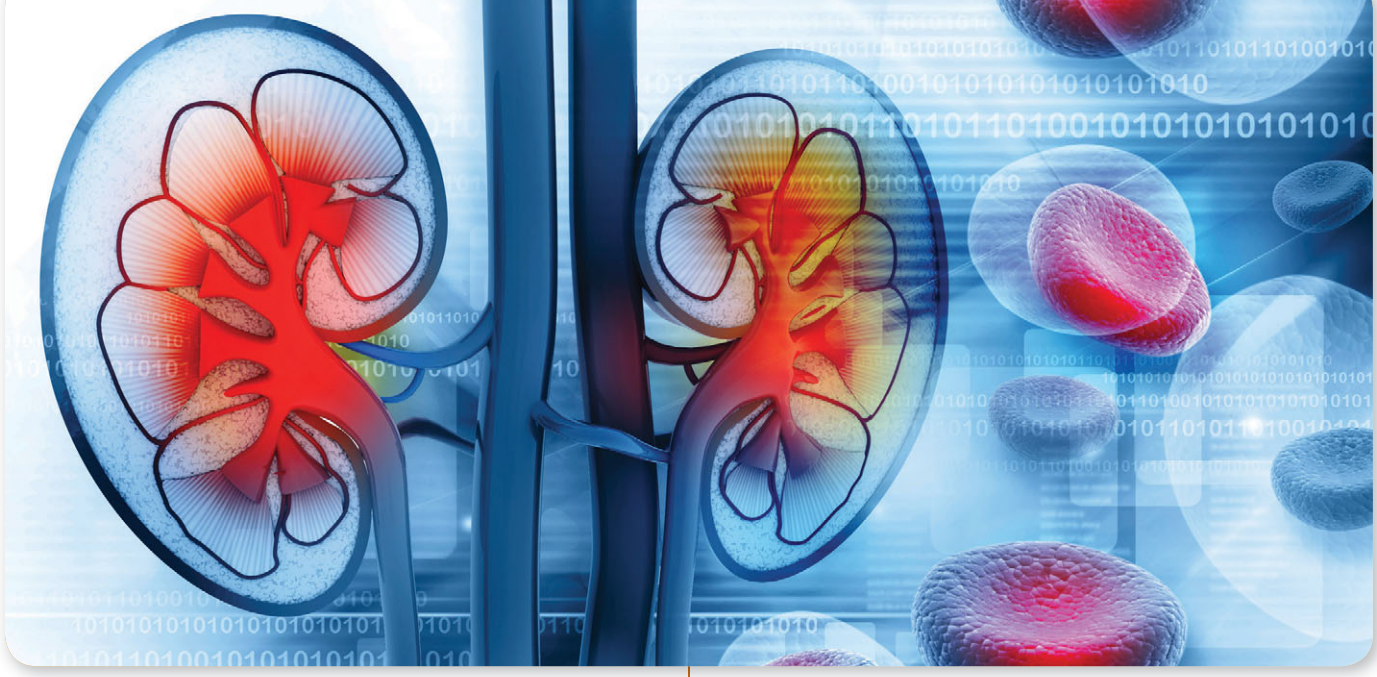
3. They produce toxic **polyol compounds**, which disrupt the functioning of vascular and endothelial cells.[58]

Remarkably, studies indicate that benfotiamine protects endothelial cells from all three of these damaging effects of AGEs.[56-58] This protection ultimately improves the functioning of blood vessels and heart muscle.[59,60]

An interesting study on humans revealed just what a dramatic impact these effects would have on heart health. In the study, subjects took **1,050 mg** of benfotiamine per day for three days. The scientists wanted

Conditions Linked With Elevated Blood Glucose And Advanced Glycation End Products

- Neuronal dysfunction[69]
- Alzheimer's disease[69,70]
- Cardiovascular disease[24,27,31] and stroke[71]
- Eye cataracts[29]
- Reduced muscle function[19]
- Kidney disease[2,30]
- Neuropathy[23]
- Liver damage[72]
- Stiffening of connective tissues in joints[17,73]
- Damage to collagen and elastin, which ages the skin[19]
- DNA damage[74] and an increased risk of cancer[68]
- Enlarged prostate, or benign prostatic hyperplasia (BPH)[75]
- Greater incidence and severity of obstructive sleep apnea[28]
- Accelerated aging[2,32]



to determine the effect benfotiamine would have on the changes in endothelial function and blood flow that occur as a result of consuming a meal rich in advanced glycation end products.[59] The striking outcome of supplementation revealed that benfotiamine *completely* prevented endothelial and blood flow impairment![26,61]

Benfotiamine also counters the negative effects of oxidative stress on blood vessels. In a study in which rodents were experimentally induced with vascular endothelial dysfunction, supplemental benfotiamine resulted in improved endothelial integrity and function by enhancement of production of *nitric oxide*, a compound that helps blood vessels to relax.[53,73]

Blood sugar and advanced glycation end products greatly contribute to the diminished heart-muscle function known as heart failure, which can be caused by a heart attack or untreated high blood pressure. Scientists have demonstrated that benfotiamine helps normalize the heart muscle's ability to contract, salvaging damaged heart muscle and improving its capacity to effectively pump blood.[60]

Benfotiamine Inhibits Sugar-Related Kidney Disease

Kidney disease, or *nephropathy*, is a known side effect of "natural" aging, but it is also a common and very serious complication of excess blood sugar and especially of diabetes.

Like the eyes, the kidneys are rich in tiny blood vessels known as *capillaries*. The kidneys are also the site of intense *metabolic activity*. These facts make the kidneys particularly vulnerable to the damaging effects of glucose and advanced glycation end products.[30]

The good news is that evidence indicates that benfotiamine helps protect against sugar-related kidney damage by reducing pathological increases in advanced glycation end products.[49,62]

In one study, benfotiamine activated the important enzyme ***transketolase***, which rapidly cleared AGEs from the blood before they could damage kidney tissue.[62]

Another study demonstrated that benfotiamine could help reduce sugar-induced kidney damage as efficiently as the prescription drug ***fenofibrate***.[63] The two in combination demonstrated beneficial synergistic effects.[63]

Benfotiamine has also been found to be helpful during various forms of *dialysis* treatments.

Hemodialysis, which is a last-resort treatment for patients whose kidneys have failed, quickly depletes the body's store of thiamine, the *very* vitamin required to prevent further glucose-related damage. Benfotiamine, which is vastly more bioavailable than thiamine, boosts thiamine levels over **4 times higher** than supplementation with thiamine in dialysis patients.[64]

Peritoneal dialysis is somewhat less stressful to the body than hemodialysis, but it is associated with substantial damage to the delicate tissues lining the abdominal cavity, believed to be caused by glucose and AGEs.[65] By reducing the level of AGEs during *peritoneal dialysis*, benfotiamine decreases markers of inflammation and abnormal new blood vessel formation in the abdominal cavity.[65] This protects the delicate abdominal lining, prolonging its usefulness as a dialysis site.

Both types of dialysis also substantially damage DNA throughout the body, increasing the risk of cancer. Benfotiamine treatment has been shown to significantly reduce this DNA damage in dialysis patients by reducing the circulating advanced glycation end products.[66-68]

These results provide dramatic evidence of the high degree of kidney protection that benfotiamine offers against blood sugar increases and advanced glycation end products.

Summary

Just over a decade ago, the health-devastating and faster-aging effects of **high blood sugar** were associated almost exclusively with diabetics. But healthy individuals are also susceptible to the chronic, age-related diseases triggered by high blood sugar.

Something as simple as eating a heavy meal can ultimately lead to the production of deadly byproducts called **advanced glycation end products** that damage cells, tissues, and organs—*and even cause premature aging*.

Fortunately, the discovery of a relative of thiamine (vitamin B1) called **benfotiamine** has provided a way to powerfully boost intracellular levels of thiamine, the body's natural defense against the AGEs that cause sugar-related tissue damage.

Numerous studies confirm that benfotiamine blocks the pathways of Alzheimer's disease, vision loss, cardiovascular disease, and kidney damage.

Benfotiamine, with its impressive safety record, has shown itself to be a powerful factor in slowing glycation-induced aging—potentially maximizing life span—in both diabetic and nondiabetic individuals. ●

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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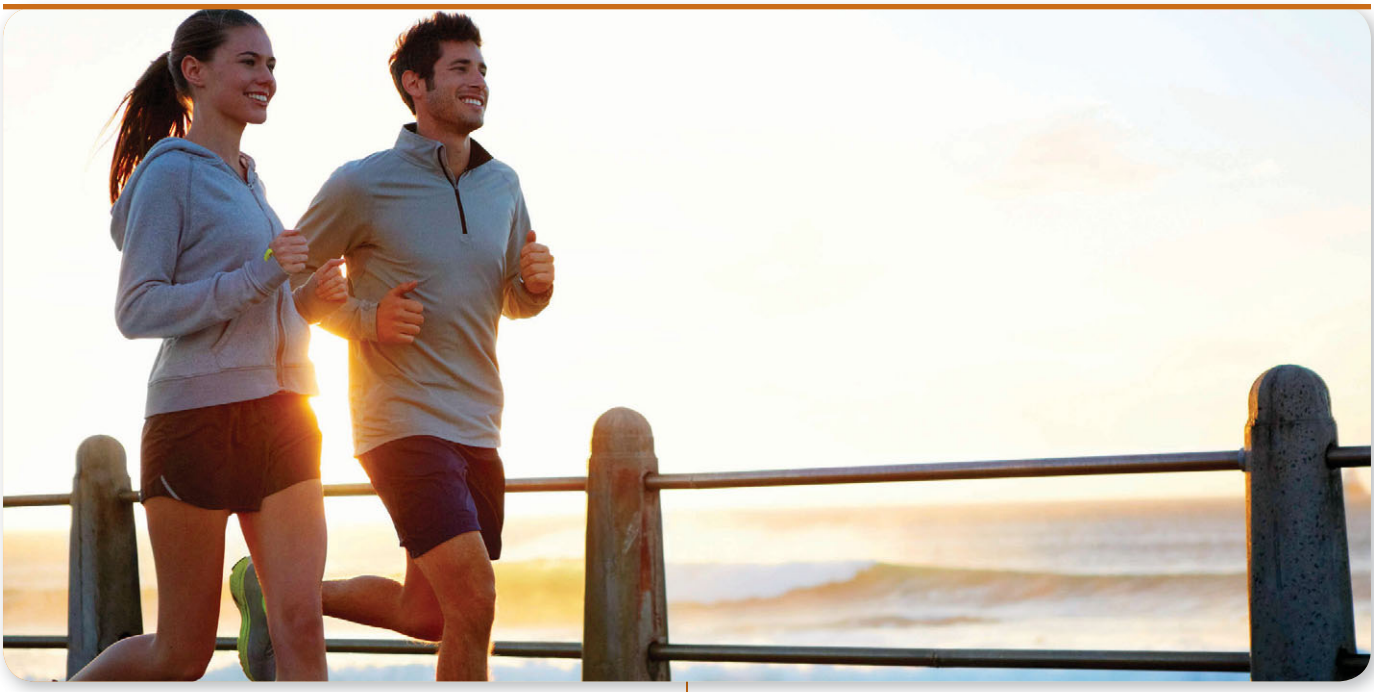

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EGCG FOR OPTIMAL HEALTH

Nearly 6,000 studies have been published on the broad-spectrum health benefits of **green tea**. Research shows that green tea favorably influences cardiovascular health, lipid clearance, glucose tolerance, healthy body weight, DNA support, prostate and breast health, and healthy cell division.[1-7] Scientists have identified the polyphenol **EGCG** as the key compound for green tea's multimodal health benefits.[8]

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Each bottle will last over **three months** at the typical dose of one capsule daily.

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Advanced Defense Against Cellular Aging

NAD+ Cell Regenerator

If you are experiencing fatigue and lack of motivation, it may be due to the age-related decline in **NAD+** levels[1] and subsequent impairment of healthy cellular metabolism.[2]

NAD+ (*nicotinamide adenine dinucleotide*) promotes systemic youthful functions and is found in every cell in the body.[3] In addition, **NAD+** plays an essential role in regulating **genes**[4,5] that control aging.[6]

How To Boost NAD+ Levels Within Your Cells

Newly patented **nicotinamide riboside** increases cellular levels of **NAD+** in the body.[7,8]

For the first time, aging humans have an effective and affordable method to boost the critical **NAD+** enzyme for refreshed vitality.

Nicotinamide riboside represents an innovative advance to combat aging that functions via unique mechanisms not found in typical dietary supplements. It has emerged as a front-line weapon in **Life Extension®**'s ongoing war against premature aging.

The name of this new **nicotinamide riboside** formulation is **NAD+ Cell Regenerator™**.

Multiple Benefits Of Increasing NAD+ Cellular Levels

Nicotinamide riboside has been documented to help replenish cellular **NAD+** and in the process:

- Promote sirtuin (SIRT1 and SIRT3) gene activation,[6]
- Enhance growth and efficiency of mitochondria—supporting energy levels and physical performance,[6]
- Favorably modulate metabolism,[6]
- Contribute to neuronal health—supporting cognitive function during aging,[9-11]
- Promote insulin activity—supporting healthy blood sugar in those within the normal range.[6]

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MEGA BENFOTIAMINE

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Scientists have known that when blood sugar combines with fats and proteins the result is known as *glycation*, and it produces *accelerated aging.*[1] Even those with blood sugar levels within normal range experience the impact of systemic *glycation* on a daily basis.[2]

Fortunately, researchers in Japan developed **benfotiamine**, a unique form of vitamin B1 (thiamine) that supports healthy blood sugar metabolism and protects against *glycation*.[3-5] What makes **benfotiamine** especially effective is that unlike ordinary vitamin B1, it is fat soluble and can easily penetrate the inside of cells.[6] Regular vitamin B1 is water soluble and has a short life span in the body.[7]

Mega Benfotiamine helps inhibit the formation of *advanced glycation end products* (AGEs) to maintain healthy endothelial, retinal, kidney, and nerve cell function.[8-12]

Each capsule provides **250 mg** of **benfotiamine** and **10 mg** of vitamin B1 (as thiamine HCl).

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Item #00925 • 120 vegetarian capsules

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4 bottles		**$20.25 each**

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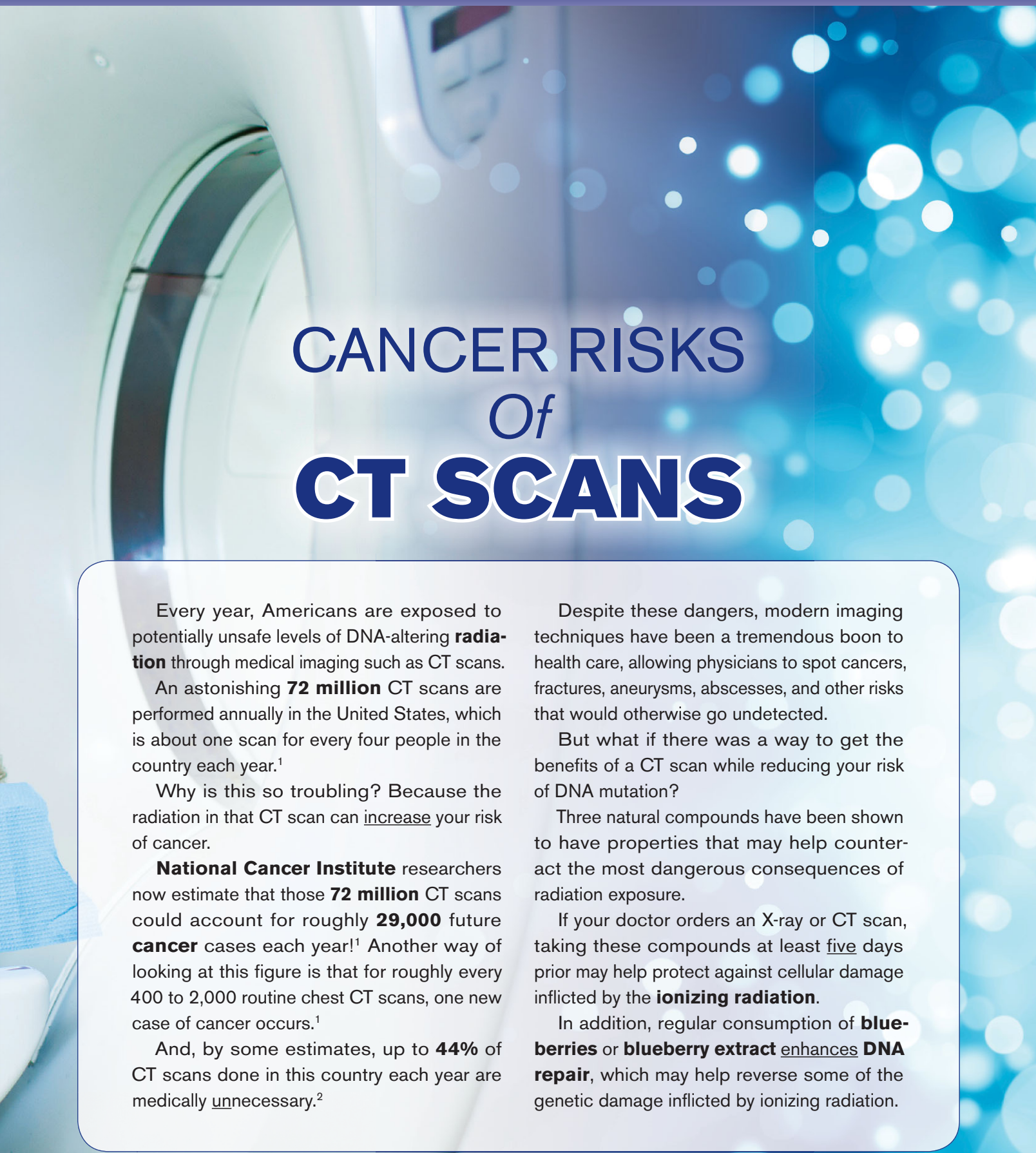
BY ANDREA LEVY



CANCER RISKS *Of* CT SCANS

Every year, Americans are exposed to potentially unsafe levels of DNA-altering **radiation** through medical imaging such as CT scans.

An astonishing **72 million** CT scans are performed annually in the United States, which is about one scan for every four people in the country each year.[1]

Why is this so troubling? Because the radiation in that CT scan can increase your risk of cancer.

National Cancer Institute researchers now estimate that those **72 million** CT scans could account for roughly **29,000** future **cancer** cases each year![1] Another way of looking at this figure is that for roughly every 400 to 2,000 routine chest CT scans, one new case of cancer occurs.[1]

And, by some estimates, up to **44%** of CT scans done in this country each year are medically unnecessary.[2]

Despite these dangers, modern imaging techniques have been a tremendous boon to health care, allowing physicians to spot cancers, fractures, aneurysms, abscesses, and other risks that would otherwise go undetected.

But what if there was a way to get the benefits of a CT scan while reducing your risk of DNA mutation?

Three natural compounds have been shown to have properties that may help counteract the most dangerous consequences of radiation exposure.

If your doctor orders an X-ray or CT scan, taking these compounds at least five days prior may help protect against cellular damage inflicted by the **ionizing radiation**.

In addition, regular consumption of **blueberries** or **blueberry extract** enhances **DNA repair**, which may help reverse some of the genetic damage inflicted by ionizing radiation.

CT Scans Boost Cancer Risk

After years of overlooking the potential risks of medical imaging, mainstream physicians are finally beginning to acknowledge the dangers of these radiation-based diagnostic tools.

In **2013**, a scientific consensus was reached that even just one **CT scan** in childhood is linked to the risk of developing future cancers. Of course, cancer risk estimates for individuals must also include other criteria like specifics of exposure, age at exposure, and absorbed dose to certain tissues.[3]

This consensus was likely triggered by a deeply disturbing 2013 study published in the prestigious *British Medical Journal* (BMJ).[4]

The researchers behind that study followed approximately 11 million individuals from birth in the 1980s into young adulthood, identifying over 680,000 who had at least one CT scan during that period. They compared the cancer rate in this extremely large group of patients with an equally large, matched group who were never exposed to a CT scan.

The results were alarming.

The study found that those who had undergone CT scans in their childhood had a **24%** increased risk for developing any cancer, compared with those who didn't have scans.[4] They also found that the more scans a person had, the greater the risk of developing cancer.

The risk persisted for years after the original scan was completed, producing cancer risks, compared with unexposed individuals, which were:[4]

- **35%** higher in the first four years following exposure
- **25%** higher at five to nine years
- **14%** higher at 10 to 14 years

Even 15 or more years following the first exposure to this level of ionizing radiation, cancer risks remained stubbornly elevated by **24%**.

Virtually every kind of cancer was documented to occur in excess in the CT-exposed group, including solid tumors (digestive organs, skin, ovary/uterus, urinary tract, brain, and thyroid), leukemia (blood cancer), lymphomas, and other cancers.[4]

Let's take a quick look now at exactly ***how*** the radiation in CT scans (and other X-ray-based technologies) raises your cancer risk and threatens your longevity. Understanding this will help you and your doctor make a more rational decision as to whether a particular CT scan is scientifically warranted.

How Ionizing Radiation Causes Cancer And Other Deadly Threats

For all the potential good they can do, CT scans expose us to surprisingly high levels of **ionizing radiation**. On a cellular level, ionizing radiation can strip electrons from the atoms that make up our tissues, producing energetic chemical ions that damage tissue and impose potent genetic stresses.

One of the most dangerous outcomes of exposure to ionizing radiation is damage to the DNA contained in the nucleus of the cells in your body.[5] Damaged DNA is an open invitation to cancer development. The problem that damaged DNA presents is that it removes the effective controls our bodies use to regulate the cell reproductive cycle and keep cell growth and replication in check.[6]

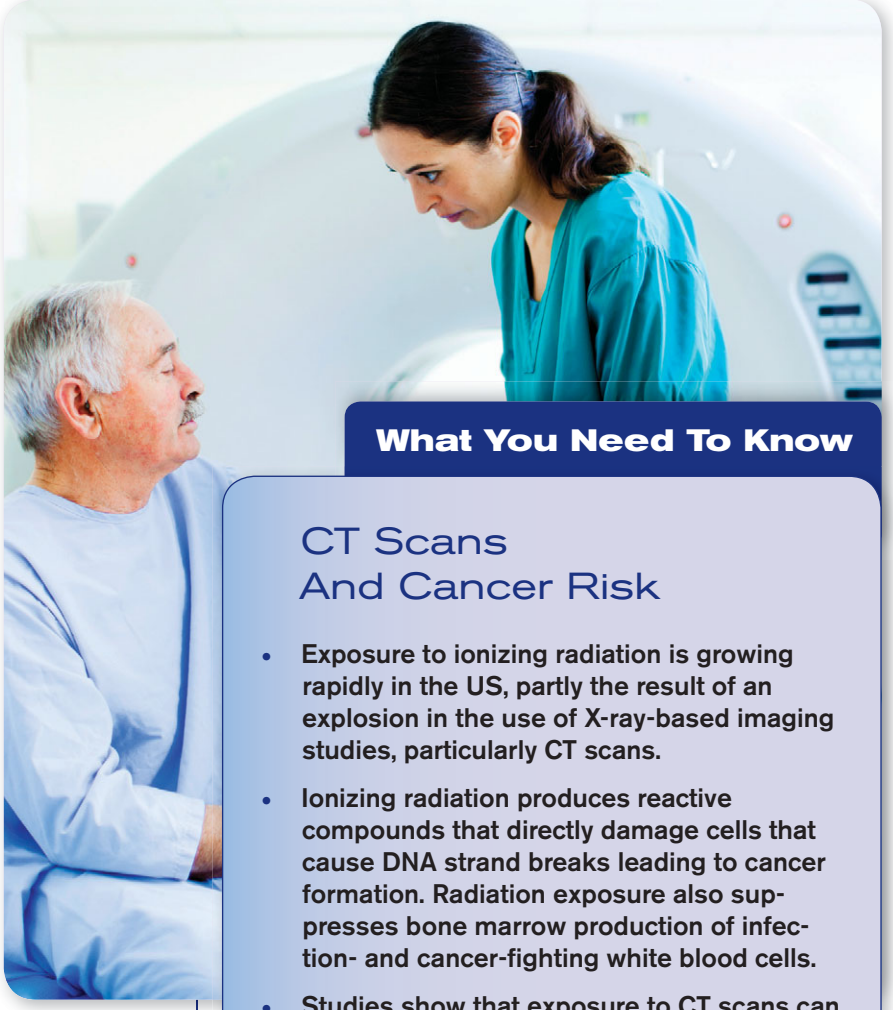
Ionizing radiation's effects on tissues are both immediate and long lasting. When human tissue is irradiated, a number of DNA-breaking compounds form. Together these are known as "***clastogenic factors***."[7-9] Most clastogenic factors that form in living tissue are associated with *reactive oxygen species* whose unpaired electrons actively react with DNA molecules, inducing breaks in DNA strands that can lead to cancer.[10-12]

Unfortunately, cancer-inducing clastogenic factors have a very long life within the body. Studies show that survivors of the atomic bomb attacks in Japan contin-

ued to have such factors detectable in their blood more than **30 years** later.[7]

Ionizing radiation poses a large range of other threats to one's health as well. It can directly impair cell functions, leading to the loss of proper tissue and organ operation as well as killing cells.[13] One victim of ionizing radiation is the fat-laden cell membrane. Under the effects of ionizing radiation, membrane-bound fats undergo oxidation and form toxic breakdown products.[14]

Recent studies also document that X-rays and other forms of ionizing radiation activate inflammatory pathways and produce early cell death.[15] And, ever since the first nuclear physicists began assembling atomic bomb components, it has been clear that ionizing radiation causes potentially lethal but silent bone marrow damage. This impairs the development of the white blood cells that protect us from infections and cancer, the red blood cells that carry oxygen to all of our tissues, and the platelets that help us stop bleeding after an injury.[16,17] And bone marrow is where hematological cancers like leukemia originate.



Protection From Ionizing Radiation

Fortunately, it may be possible to derive the benefits of modern imaging techniques while obtaining some protection from the radiation exposure.

Three specific nutrients have been found to help counteract the toxic effects of ionizing radiation. They include the following:

1. ***Lemon balm***, which prevents the formation of damaging chemicals triggered by ionizing radiation,[18,19]

2. ***Ginkgo biloba***, which protects fragile DNA from the resulting cancer-causing damage,[7,8]

3. ***Spirulina***, which stimulates the immune system, particularly bone marrow, to make and maintain levels of white blood cells, whose production is impaired by ionizing radiation.[20]

Let's look at each individually.

What You Need To Know

CT Scans And Cancer Risk

- **Exposure to ionizing radiation is growing rapidly in the US, partly the result of an explosion in the use of X-ray-based imaging studies, particularly CT scans.**
- **Ionizing radiation produces reactive compounds that directly damage cells that cause DNA strand breaks leading to cancer formation. Radiation exposure also suppresses bone marrow production of infection- and cancer-fighting white blood cells.**
- **Studies show that exposure to CT scans can increase the risk of cancer by at least 24%, and that those risks last for years after the test is completed.**
- **You may help protect yourself ahead of a scheduled CT scan or other study involving ionizing radiation by taking specific nutrients on a timely basis.**
- **Lemon balm reduces production of reactive chemical compounds by radiation, helping cells retain their integrity.**
- **Ginkgo biloba reduces DNA damage that can lead to cancer.**
- **Spirulina supports bone marrow production of white and red blood cells, protecting against the risk of infection.**
- **By having these ingredients on hand, one can initiate potential protective measures if the need for a CT scan or exposure to other radiation sources arises.**

Lemon Balm Extract

Lemon balm extract is known for its ability to preserve foods, particularly meats, from oxidant stress that induces spoilage. This same mechanism helps protect against a similar form of chemical stress induced in the body by ionizing radiation.[18] In fact, one particular study found that lemon balm extract has numerous protective mechanisms:

- Lemon balm can boost levels of the *superoxide dismutase* (SOD), an essential component of the body's native ability to protect itself from the effects of ionizing radiation and other major chemical stresses.[19]
- Lemon balm defends lipid cell membranes in living organisms, as shown by a sharp reduction in the lipid peroxidation that is a measure of direct cell damage following radiation exposure.[19]
- Lemon balm also protects DNA, as shown by a reduction in the amount of the plasma marker 8-OH-dG, a product of oxidized DNA damage.[19,21]

A human study documents the benefits of lemon balm in radiation technologists, who are exposed to persistent low-level radiation during their routine work despite taking precautionary measures. For the study, the radiation technologists consumed lemon balm tea (**1.5 grams/100 mL**) twice daily for 30 days.[19]

CT Scans and X-Rays Are Not The Only Radiation Risk

Exposure to radiation released from **nuclear accidents** can be more deadly than a single CT scan.

Most health-conscious people keep a supply of **potassium iodide** on hand in case of a nuclear emergency. When properly ingested, potassium iodide travels to the thyroid gland and saturates it with iodine, thus blocking entrance into the thyroid gland of **radioactive iodine** (e.g. the radionuclide iodine-131).

The thyroid is the most sensitive part of the body to radioactive iodine, but bone marrow and other tissues are also adversely affected and not protected by potassium iodide.

Those concerned with adverse nuclear events may want to keep nutrients close by that have been shown to provide more systemic protection against radiation damage.

Lemon balm.

The lemon balm tea produced a beneficial *increase* in the activity of natural enzyme systems that fight chemical/oxidant stress, including:

- A **71%** increase in superoxide dismutase (SOD) activity,
- A **12%** increase in glutathione peroxidase (GPX, another native antioxidant molecule) activity,
- A **61%** increase in catalase (CAT) activity.

In addition, the lemon balm tea produced a beneficial *decrease* in numerous markers of cellular and DNA damage, including:

- A **31%** decrease in the activity of myeloperoxidase (MPO, an indicator of fat oxidation)
- A **29%** decrease in markers of lipid peroxidation (LPO), indicating cell membrane damage,
- A **10%** decrease in 8-OH-dG, a marker of DNA damage.

In other words, prior to supplementation, these technologists, despite careful shielding and limitation of their exposure, were walking around with evidence of the impact of ionizing radiation in their bodies, which was reduced by lemon balm supplementation.

Ginkgo Biloba

Ginkgo biloba is a well-known botanical capable of scavenging the reactive oxygen species that make up the bulk of clastogenic (DNA-breaking) factors produced by radiation.[22] Ginkgo biloba reduces the levels of DNA strand breaks that lead directly to cancer.

Lab studies show that irradiation of whole blood from healthy volunteers produced an average of **18** *abnormal* chromosomes per **100** cells, which indicates very high-level clastogenic activity. However, when similar specimens were treated with ginkgo biloba extract, the number of abnormal chromosomes fell to **7.3** per **100** cells—a significant reduction of nearly **60%**.[8]

The protective effects of ginkgo biloba extract were demonstrated in a unique, if tragic, setting: the 1986 radiation disaster at Chernobyl, in what is now Ukraine.

A 1994 study evaluated blood samples from Armenian workers involved in the initial clean-up of the nuclear reactor, finding an average of **17.9** per **100** cells with chromosomal damage, compared with just **5.7** per **100** in control samples. The same group of researchers treated 30 of those workers with ginkgo biloba extract, containing bioactive flavonoids and terpenoids, at a dose of **40 mg** three times daily (total dose **120 mg** per day) for a two-month period.[7]

At the end of the treatment period, the clastogenic (DNA-breakage-inducing) activity of the subjects' plasma fell to control levels. The benefits persisted for at least seven months, but by one year, **33%** of the workers again showed elevated clastogenic factors, demonstrating the persistency of the cancer-inducing risk of radiation damage to DNA.

A more recent study demonstrated the protective effects of ginkgo biloba extract in patients undergoing radioactive iodine treatments for Graves' disease (an autoimmune condition involving abnormally high thyroid activity).[23]

Radioactive iodine therapy increased chromosomal damage in placebo patients, which peaked at 21 days. In patients supplemented with ginkgo, that early rise in chromosomal damage was followed by a rapid return towards baseline levels. This study revealed a significant increase in DNA damage in the placebo group overall. Interestingly, clastogenic factors never rose significantly above baseline in the ginkgo supplemented subjects.[23]

Since radioactive iodine therapy is provided as implanted material, this study demonstrates the potent radioprotective effect of ginkgo biloba extract even in the face of continuous radiation exposure within the body.


Ginkgo biloba.


Spirulina.

Spirulina Extract

Spirulina extract enhances white blood cell production following exposure to ionizing radiation.

The bone marrow is a major site of immediate toxicity from ionizing radiation. Those exposed to very high doses of radiation often end up with fatal, overwhelming infections.[20,24] Spirulina extract promotes the production of bone marrow-stimulating growth factors such as *granulocyte macrophage colony-stimulating factor* (GM-CSF).[20,24]

Another way spirulina helps protect the immune system is by increasing the production of antibodies.[25] Antibodies are complex proteins that bind to invading organisms, and flag them for destruction.[26] In a study of mice exposed to gamma-irradiation, spirulina polysaccharides containing a molecule called *C-phycocyanin* stimulated the recovery of white blood cells and bone marrow cell counts suppressed by the radiation exposure.[27] In addition, radiation-induced anemia was also suppressed.

These effects translate directly into humans, as shown by a study using lymphocytes (white blood immune system cells) from nuclear power plant workers, which showed that pretreatment of the cells with C-*phycocyanin* from spirulina stimulated the cells' natural antioxidant systems, protecting them from destruction.[28]

In a compelling study of youngsters exposed to radioactive fallout from the Chernobyl nuclear plant explosion, a daily **4 gram** dose of spirulina (containing the active *C-phycocyanin*) for 21 days produced marked increases in the **white** and **red blood cell counts** that had been suppressed by the **radiation**.[29] Additionally, elevated levels of inflammatory *eosinophils* were restored back into the normal range, and anemia, as defined by low hemoglobin levels, was also corrected.

Summary

The use of medical imaging technology, especially CT scans, enables doctors to noninvasively see injuries and diseases deep inside our bodies. But that same technology brings with it a serious threat: *ionizing radiation*.

A recent study showed a single CT scan in youth can increase one's long-term risk for subsequent cancer by **24%**.

Fortunately, specific nutrients with complementary actions may help provide protection against radiation ahead of time. Lemon balm extract prevents formation of dangerous reactive chemicals formed by ionizing radiation exposure, ginkgo biloba extract protects DNA from cancer-causing damage, and spirulina extract supports bone marrow and its production of vital blood cells.

If you need to undergo a CT scan or other potent source of ionizing radiation, start supplementing with these three protective ingredients one to three times daily for five days prior to the scan and for a minimum of five days afterwards. They are now available in a combination formula for consumer convenience.

In addition, regular consumption of **blueberries** or **blueberry extract** markedly enhances **DNA repair**, which can help protect damaged cells from undergoing deadly mutations. ●

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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CT Scans: A New Public Health Threat

When they were first made available, CT scanners were used only in major, tertiary-care hospital centers, and their use was restricted to only the sickest and most challenging patients. In those years, the benefits of getting a scan clearly outweighed the (then unknown) risks of the radiation exposure.

But in the past two decades, the collective radiation dose from medical images has grown **6-fold**, with concomitant growth in the rate of new, preventable cancers.[30]

CT scans amount to a series of individual X-ray images, organized by a powerful computer to produce a high-contrast 3-D image of body contents. Differences in the "transparency" of tissues to the passage of X-rays produce the patterns that doctors can interpret to highlight individual organs and other structures, readily revealing their inner workings, and also revealing abnormal structures such as tumors, abscesses, and other signs of trouble. But that means that a single CT scan exposes your body to an amount of radiation comparable to that from multiple individual X-rays, thereby raising your cancer risk.

How great is that risk? The best way to understand this is by comparing CT scan radiation exposure to the exposure we constantly receive from outer space (mainly the sun).

Radiation exposure is measured in units called Sieverts (Sv), named after an early radiation researcher. The best estimates are that in one year, a person is naturally exposed to about **3 milli-Sieverts** (mSv) from background radiation in space. By contrast, a single head CT scan produces **2 mSv** of exposure, while a full abdominal CT scan may involve more than **30 mSv**, or **10-fold** the annual natural exposure.[2]

And that's a major concern.

Radiation doses between **5** and **125 mSv** are associated with *statistically significant* increases in cancer risk, readily explaining the tremendous increase in cancer risk seen in the giant *British Medical Journal* study.[2]

People who already have a known malignancy are often exposed to even higher radiation levels than healthy individuals because of the frequency of scans for diagnostic and follow-up purposes. One study showed that patients with lymphomas underwent an average of 3.5 CT scans during their treatment periods, a rate that nearly doubled during their post-treatment surveillance period to **6.3** per person.[31] The radiation intensity also increased, from an average **39 mSv** during treatment to **53 mSv** during surveillance.

The value of frequent CT scans and more importantly, PET/CT scans, in patients undergoing cancer treatment outweighs the radiation risk. In this instance, insurance company cost-containment mandates are *denying* cancer patients optimal access to PET/CT scanning. The reason that properly read PET/CT scans are so important is that they can detect tiny malignant lesions before symptoms of recurring cancer manifest. This enables the treatment protocol to be adjusted with the objective of eradicating the small tumors before they grow too large.

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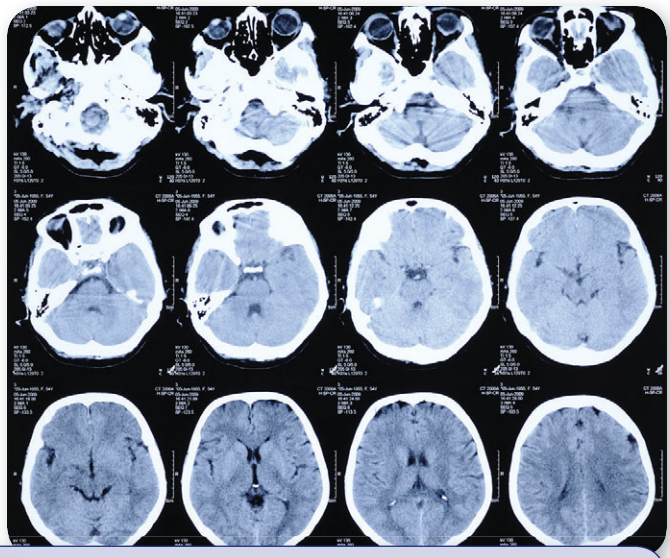

The Overuse Of CT Scans

With the mounting evidence of the dangers caused by excessive radiation exposure, why isn't the medical community taking major steps to reduce the numbers of scans, or at the very least, to limit the dose of radiation when a scan can't be avoided? There are a few answers, and none of them are encouraging.

First, CT scans are extremely lucrative. Indeed, there are those who question whether physician ownership of radiology operations is to blame for its overuse. By some estimates, **26** to **44%** of CT scans ordered are considered inappropriate and unnecessary.[2]

Technical improvements in CT scanners themselves have in fact permitted a reduction in radiation exposure per scan, but the ease and relatively low cost of such scans has led to a concomitant increase in the number of scans carried out every year, overshadowing the gains made by technology and leaving patients vulnerable.[32]

There is also simply old-fashioned resistance to change. Most hospitals now use digital radiographic equipment, which makes images with similar technology to the digital camera in your smart phone. The newer equipment can make images with much lower X-ray doses, but few radiology departments have bothered to take advantage of that.[16] Instead, they have simply continued to use the outdated protocols and high radiation levels needed to expose old-fashioned X-ray film. Studies show that substantial reductions in X-ray intensity are possible, which not only don't reduce image quality, but in fact enhance it.[33]

Radiologists also put pressure on the poorly paid technologists who perform the actual tests, wanting the highest-quality images the first time a patient goes through the scanner. This results in routine use of higher-than-necessary doses of radiation to achieve a sharp image—even though studies show that many CT scans can achieve good-quality studies with ultra-low radiation doses equivalent to a single chest X-ray.[32,34-37]

Sadly, and frighteningly, very recent studies reveal that radiology workers (physicians, including those in training, technologists, and others) have poor knowledge about radiation risks, with technologists (those who work daily directly with the equipment that generates X-rays) having the lowest knowledge level.[38] These knowledge gaps led directly to a significant underestimation of radiation doses and cancer risks from the kinds of X-rays done on a routine basis.[38]

Consumers, at least, are beginning to push back, as seen by an article highlighting all these risks in *Consumer Reports* in 2015.[39] But despite the considerable power of consumer groups, the medical establishment is always slow to change—and your options are limited in the meantime.

You can and should ask that the lowest possible radiation dose be used when you must undergo a CT scan or other ionizing radiation-producing test, but that can be a difficult task for most of us not versed in medical terminology, and not understanding the multiple layers of decision-making in a large hospital or medical center.

Rather than skipping a potentially lifesaving test, and in addition to standing up for your own safety at the radiology suite, you can be nutritionally prepared ahead of time by loading your body with three specific nutrients known to be capable of mitigating the damage from ionizing radiation: lemon balm, ginkgo biloba, and spirulina.

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Past research has also shown the ability of taurine to maintain and support:[3-9]

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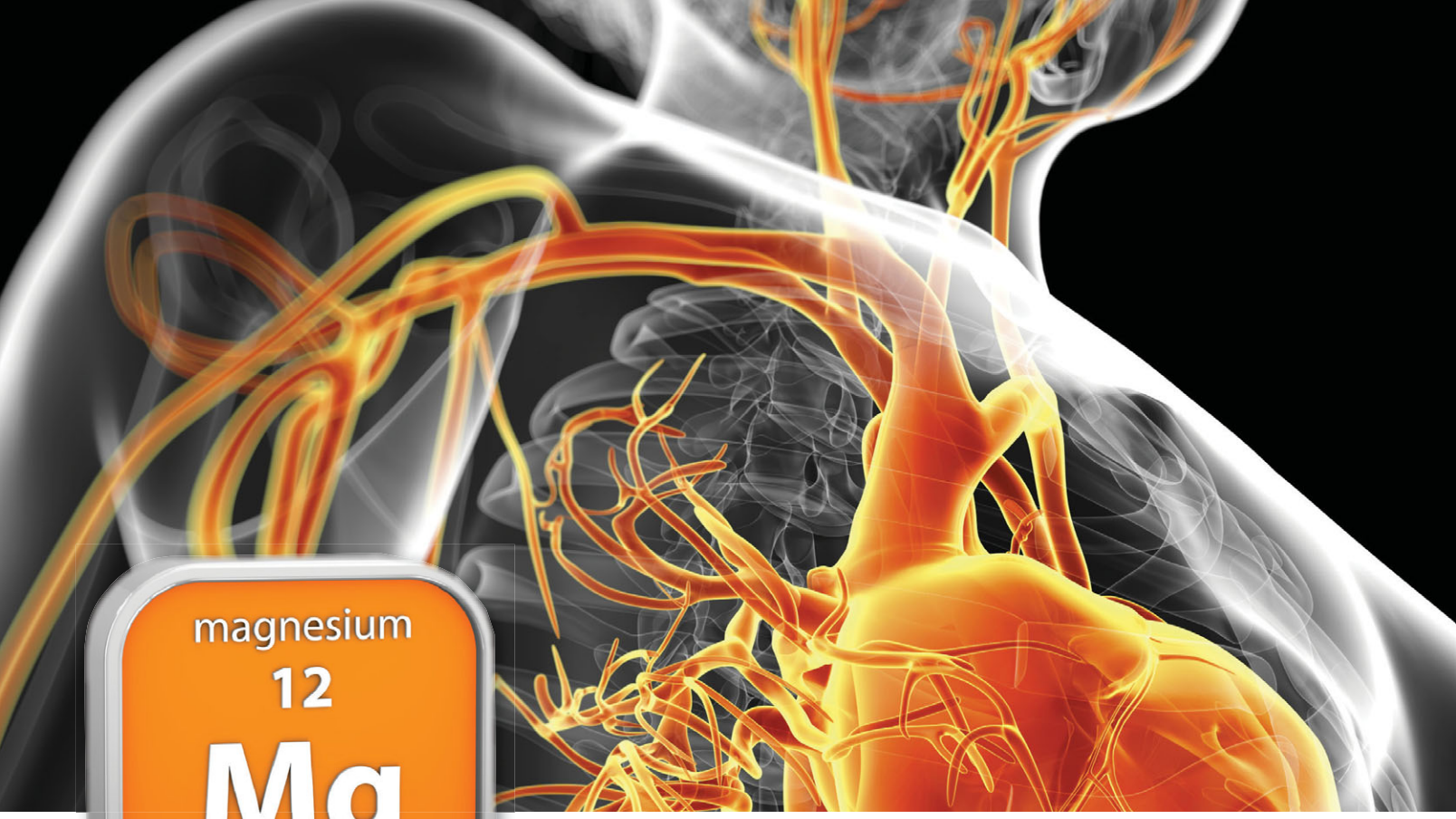

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Caution: If taken in high doses, magnesium may have a laxative effect. If this occurs, divide dosing, reduce intake, or discontinue use.

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From solar *ultraviolet* to *cosmic radiation* to *X-rays* from medical diagnostic imaging procedures like CT scans, ***ionizing radiation*** consists of waves and particles of sufficient energy to disturb atoms, "knocking out" electrons to create *ions*.

Also known as *free radicals*, these ions have the potential to interact with living tissues and disturb cell structures, including fragile DNA.

In addition to limiting and/or avoiding excessive ionizing radiation exposure from various sources (e.g. recurrent transcontinental plane travel and frequent medical diagnostic imaging procedures like CT and/or PET scans) whenever reasonable, additional cellular support during ***ionizing radiation*** exposure and ***free radical*** generation is helpful for optimal health.

A review of the published scientific literature reveals that certain nutrients may help support and nourish the body's cellular integrity in the context of **ionizing radiation**.

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The new **X-R Shield** provides three nutrients that help support and maintain cellular integrity[1-5]:

LEMON BALM supports production of ***superoxide dismutase*** (SOD), ***glutathione peroxidase***, and ***catalase***—your body's natural defense against oxidative damage.[1] They provide critical support by inhibiting the formation of dangerous free radicals[1,2]—supporting your body's natural defense of critical DNA.

GINKGO BILOBA supports the body's capacity to scavenge reactive oxygen species, which can interact with DNA.[3] This further helps support your body's natural defense system in the context of DNA.[4]

ORGANIC SPIRULINA supports immune system production of white blood cells in the bone marrow.[5] These immune cells are critical for a healthy immune response.

Prior to ***ionizing radiation*** exposure (e.g. transcontinental plane travel or medical diagnostic imaging procedures consider taking three capsules of **X-R Shield** one to three times daily beginning at least five days beforehand and continue taking until the bottle is finished

X-R Shield

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BY EDWARD R. ROSICK, DO, MPH, DABIM

CHLOROPHYLLIN
Protects Against Environmental Toxins

Every day, we are surrounded by environmental toxins. Studies show they can contribute to diabetes, heart disease, and cancer through induction of **mutations** to our DNA.[1-5]

Fortunately, an inexpensive supplement–**chlorophyllin**–has been shown in multiple studies to **detoxify** these deadly chemicals, and protect DNA.

Proper use of **chlorophyllin** affords considerable defense against the natural and man-made toxins that permeate our food and environment.[6-8]

Environmental Toxins: An Unfortunate Fact Of Life

In the last 70 years, more than **80,000** new chemicals have been synthesized, and every year, over **4 billion** pounds of these chemicals, many known carcinogens, are released into the environment.[9] Even more disturbing is that the vast majority of these chemicals have never been adequately tested by any government agency, including the **EPA** and **FDA**, in regards to their effects on human health.[10]

On a daily basis, nearly everyone is exposed to this barrage of compounds through industrial and manufacturing facilities, agricultural runoff that includes pesticides and herbicides laced in foods, and emissions from trucks, cars, and planes. Even our brave military men and women face exposure from a multitude of chemicals used on bases and facilities around the world.

A study from the **Centers for Disease Control and Prevention** (CDC) published in 2009 confirmed these findings by examining the burden of 212 industrial chemicals in the bodies of US citizens.[11] In particular, the CDC report showed widespread exposure to commonly used industrial chemicals, including polybrominated diphenyl ethers (PBDEs) and bisphenol A (BPA), which is a chemical known for its toxic effects on reproduction.[12] BPA is reported to be present in at least **90%** of the US population. Perfluoroalkyl chemicals are present in **98%** of people sampled.[11-13] Perfluorooctanoic acid (PFOA), a type of perfluoroalkyl chemical, is best known for being part of the substance Teflon™ and is linked with multiple diseases, including ulcerative colitis,[14] kidney disease,[15] thyroid disease,[16] and cancer.[17]

Chlorophyllin: Protection Against Toxins

Chlorophyllin is a water-soluble derivative of the green plant substance ***chlorophyll***.

In multiple studies, **chlorophyllin** exhibits powerful anticarcinogenic effects in regards to a variety of environmental toxins.[6-8] The way chlorophyllin accomplishes this is by targeting a number of molecules and pathways involved in cancer development, such as protecting against ***mutations*** of the **p53 tumor suppressor gene**. Cell proliferation is partially controlled by the **p53 gene**, so protecting healthy expression of **p53** is a critical factor that helps guard against **cancerous** changes.[18]

Chlorophyllin disables potent carcinogens such as ***polycyclic aromatic hydrocarbons*** and ***heterocyclic amines*** by forming complexes with these chemicals that limit the ability of these toxins to bind to normal cells to inflict malignant changes.[19-20]

Chlorophyllin binds to a number of other common carcinogens including dibenzanthracene, dibenzopyrene and benzophenanthrene and limits their ability to form **DNA adducts**, which are strands of DNA bonded to cancer-causing toxins. Formation of DNA adducts is an early step in the formation of cancer-causing DNA mutations. **Chlorophyllin** limits DNA adduct formation caused by a variety of known carcinogens.[21-23]

Chlorophyllin also functions as an antimutagenic agent against a number of prevalent chemicals in the environment such as **PhIP** (*2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine*), known to be involved in colon, prostate, pancreatic, and breast cancer.[23-24]

Chlorophyllin Protects Against Multiple Cancers

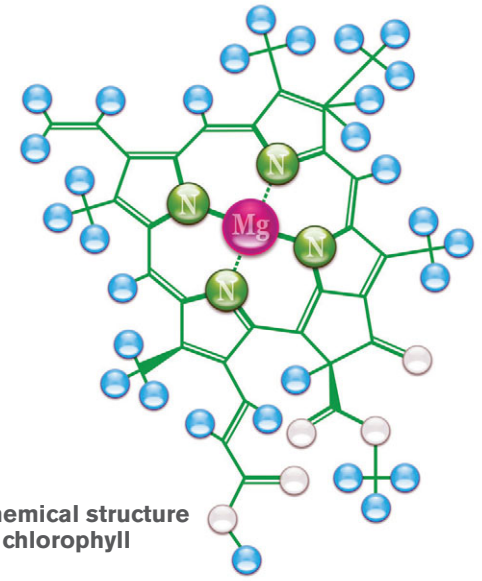
The ways in which **chlorophyllin** provides protection against cancer—and the number of cancers it's effective against have been shown in multiple studies including:

Oral Cancer: A 2012 study in hamsters showed that chlorophyllin can both prevent and reverse genetic mutations linked to oral cancer caused by the chemical 7,12 dimethylbenzanthracene (DMBA).[25] Scientists in this study conclusively showed that chlorophyllin modulated and even reversed changes to 104 genes that were deleteriously affected by DMBA.

Pancreatic Cancer: A study published in 2014 examined the effects of a number of dietary supplements on pancreatic cell lines, with the results showing that chlorophyllin has antiproliferative effects on pancreatic cells.[26]

Colon Cancer: In a study on human colon cancer cells, researchers showed that chlorophyllin-treated colon cancer cells had a statistically decreased expression of human ribonucleotide reductase (RR), an enzyme used by these cancer cells for DNA synthesis and repair. By inhibiting RR, chlorophyllin made these cancer cells less able to grow and more receptive to mainstream cancer chemotherapeutic agents.[27]

Bladder Cancer: In a 2014, researchers examined the combined effects of chlorophyllin with photodynamic therapy (PDT), a minimally invasive cancer treatment in which cancer cells take up a chemical or substance and are then exposed to a certain wavelength of light. In the presence of the photosensitizing substance, the PDT generates a form of oxygen that kills the cancer cells. In this study the researchers, using a special form of chlorophyllin, showed that when combined with photodynamic therapy (PDT), it resulted in approximately **85%** destruction of bladder cancer cells.[28]



Chemical structure of chlorophyll

What You Need To Know

Chlorophyllin Protects Against Environmental Toxins

- **Chlorophyllin provides protection against environmental toxins.**
- **Chlorophyllin is a safe, inexpensive supplement derived from the plant substance chlorophyll. It helps stop the damage done to DNA by environmental chemicals and toxins that are present in nearly everyone.**
- **Laboratory studies have shown that chlorophyllin is able to bind to and remove cancer-causing toxins in the body.**
- **Chlorophyllin targets multiple molecules and pathways involved in cancer development brought about by environmental toxin exposure, such as mutations in the p53 tumor suppressor gene so that these mutations do not occur and raise the risk of cancer.**
- **The ability of cancer-causing toxins to form DNA adducts is significantly decreased in the presence of chlorophyllin.**
- **Chlorophyllin has been shown in numerous studies to protect against multiple forms of cancer, including bladder, breast, pancreatic, and colon cancer.**
- **Aflatoxins, the cause of a significant number of liver and other cancers around the world, is significantly reduced in the presence of chlorophyllin.**
- **Chlorophyllin is a potent free radical scavenger and has been shown in studies to protect mitochondria against oxidative damage.**
- **Chlorophyllin offers optimal protection against cancer-causing DNA and mitochondrial damage in a world contaminated with toxic chemicals.**

Breast Cancer: Researchers at the University of Kentucky showed that when human breast cells were exposed to dibenzopyrene (DBP), a known carcinogen, dangerous and unstable DNA adducts were formed. However, in the presence of chlorophyllin a decrease of more than **65%** in the number of DNA adducts was observed.[29]

Stomach Cancer: A 2014 study examined the effects of chlorophyllin on stomach cancer in rats and more specifically, the effects on transforming growth factor (TGF) beta signaling, a pathway that plays a vital role in cancer formation.[30] Chlorophyllin showed strong effects in stopping cancerous growth and metastasis, leading the authors of the study to conclude: "***Dietary chlorophyllin that simultaneously abrogates TGF beta signaling pathway and the key hallmark events of cancer appears to be an ideal candidate for cancer chemoprevention***."

Chlorophyllin Protects Against Liver Cancer

Out of the 600,000 new cases of liver cancer diagnosed yearly around the world, conservative estimates are that up to 155,000 of them are caused by **aflatoxin** found in multiple improperly stored foods including peanuts, corn, pistachios, and rice.[31]

Fortunately, studies show that **chlorophyllin** has the potential to significantly reduce the risk of liver cancer induced by aflatoxin by binding to carcinogenic byproducts of aflatoxin metabolism and therefore, decreasing bioavailability of these cancer-causing chemicals.[32-33]

In a study in the journal *Cancer Prevention Research*, researchers showed that in volunteers, ingestion of **150 mg** of chlorophyllin significantly decreased the absorption of aflatoxin B.[32]

An even more compelling study on the preventive power of chlorophyllin was done in Qidong, China, a province where the population is known to have a high exposure to aflatoxins and therefore, putting them at high risk of liver cancer.[33] In this randomized, double-blind, placebo-controlled study, 180 men and women were randomized to receive either **100 mg** of chlorophyllin or a placebo three times daily over a four-month period.

The researchers showed that those men and women randomized to the chlorophyllin arm of the study had a **55%** reduction in a biochemical marker of **aflatoxin** when compared to those people not taking chlorophyllin. This significant finding led the authors of this study to conclude "***...interventions with chlorophyllin or supplementation of diets with foods rich in chlorophylls may represent practical means to prevent the development of hepatocellular carcinoma or other environmentally induced cancers***."

Aflatoxin: Nature's Own Deadly Toxin

It's not just industrial chemicals that increase the risk for cancer. There are also toxic compounds found in nature. Aflatoxin, a biochemical in the class of substances called mycotoxin, is produced by molds and is one of the most common and deadly carcinogens. While aflatoxin is associated with being a cause of liver cancer[39-41] through the formation of carcinogenic by-products and its ability to cause DNA mutations, studies show that aflatoxin is also the cause of other cancers.[42-44]

An article in ***JAMA*** presented documentation that aflatoxin is a cause of gallbladder cancer.[42] In this case-control study conducted in Chile, researchers presented strong evidence that aflatoxin, known to cause gallbladder cancer in primates, is a cause of gallbladder cancer–the leading cause of cancer deaths in women in Chile–stating "***...the associations between aflatoxin exposure and gallbladder cancer were statistically significant.***" A more recent article published in 2015 in the journal *Tumour Biology* showed evidence that aflatoxin is both a potential cause of lung cancer,[55] and stimulates lung cancer cell migration, or metastasis.[43]

Chlorophyllin Shields Mitochondria

Another way that chlorophyllin provides protection against environmental toxins is via its free radical scavenging activities, both in general and specifically in **mitochondria**. In a study published in 2000, researchers looked at the protective effects of chlorophyllin on various organs and mitochondrial membranes in mice and rats.[34] The authors of this study showed that not only did chlorophyllin protect mice brains, liver, and testes from oxidative damage, but it also proved to be a potent free radical scavenger in rat liver mitochondria, leading the researchers to conclude *"**...our studies showed that CHL [chlorophyllin] is a highly effective antioxidant, capable of protecting mitochondria against oxidative damage...**"*

In another study using rat liver mitochondria, researchers showed that chlorophyllin provided significant protection against **ionizing radiation**, a potent generator of free radicals.[35] Finally, with mitochondrial damage strongly implicated in the aging process,[36-38] chlorophyllin may very well be useful in preventing chronic diseases and premature senescence.

Summary

Life Extension® described the **antimutagenic** properties of chlorophyllin in the mid-**1980**s.

There was ample evidence decades ago that taking **100 mg** of **chlorophyllin** with the heaviest meal of the day made sense because larger meals tend to contain more dietary mutagens.

A popular formula used by health-conscious people today provides **100 mg** of chlorophyllin along with other nutrients that are best taken with a heavy meal. If you ingest more than one large meal daily or are exposed to excessive dietary or environmental toxins, you may consider taking **100 mg** of chlorophyllin with each meal. ●

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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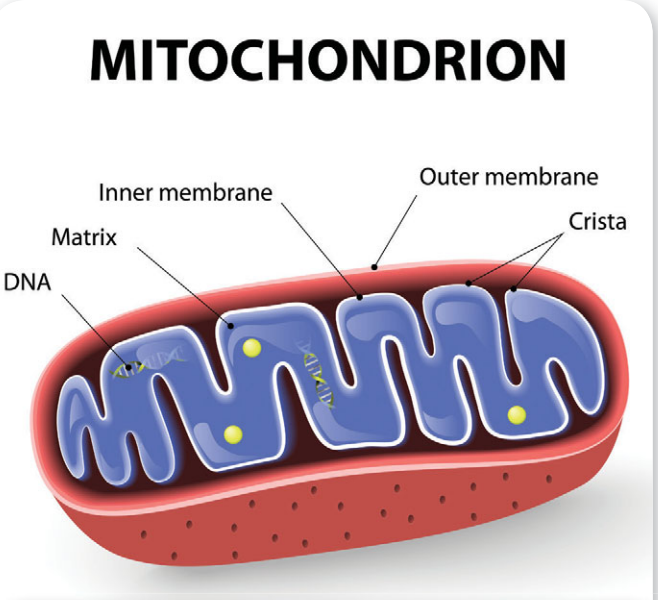

Environmental Toxins And Their Destructive Effects On Mitochondria

One way in which toxins may bring about the myriad of damage that they cause is through their destructive effects on **mitochondria**, microscopic organelles found in every human cell that convert the oxygen and food into energy. There are multiple studies that provide evidence that environmental toxins are poisons to these life-giving organelles and lead to multiple diseases including cancer,[1-2] metabolic syndrome, insulin resistance,[3-5] Alzheimer's disease,[45] Parkinson's disease,[46] chronic kidney disease,[47] and cardiovascular disease.[4]

Environmental toxins damage mitochondria in multiple ways.[48-51] **Chlorophyllin** helps neutralize these poisons.

Environmental Toxins And Cancer

Despite the claims put out by national organizations like the American Cancer Society, we are **not** winning the war on cancer. Far from it. A report sent to President Obama in 2010 by the Presidents Cancer Panel, which over the period between September 2008 and January 2009 took testimony from 45 experts from academia, government, and industry regarding environmental toxins and cancer.[52] In the panel's conclusion, they stated "…***the true burden of environmentally induced cancer has been grossly underestimated. With nearly 80,000 chemicals on the market in the United States, many of which are…understudied and largely unregulated, exposure to potential environmental carcinogens is widespread***." While research is on-going, recent studies on how environmental chemicals cause cancer include damaging changes to DNA and increasing cellular oxidative stress leading to unchecked free radical formation.[53-54]

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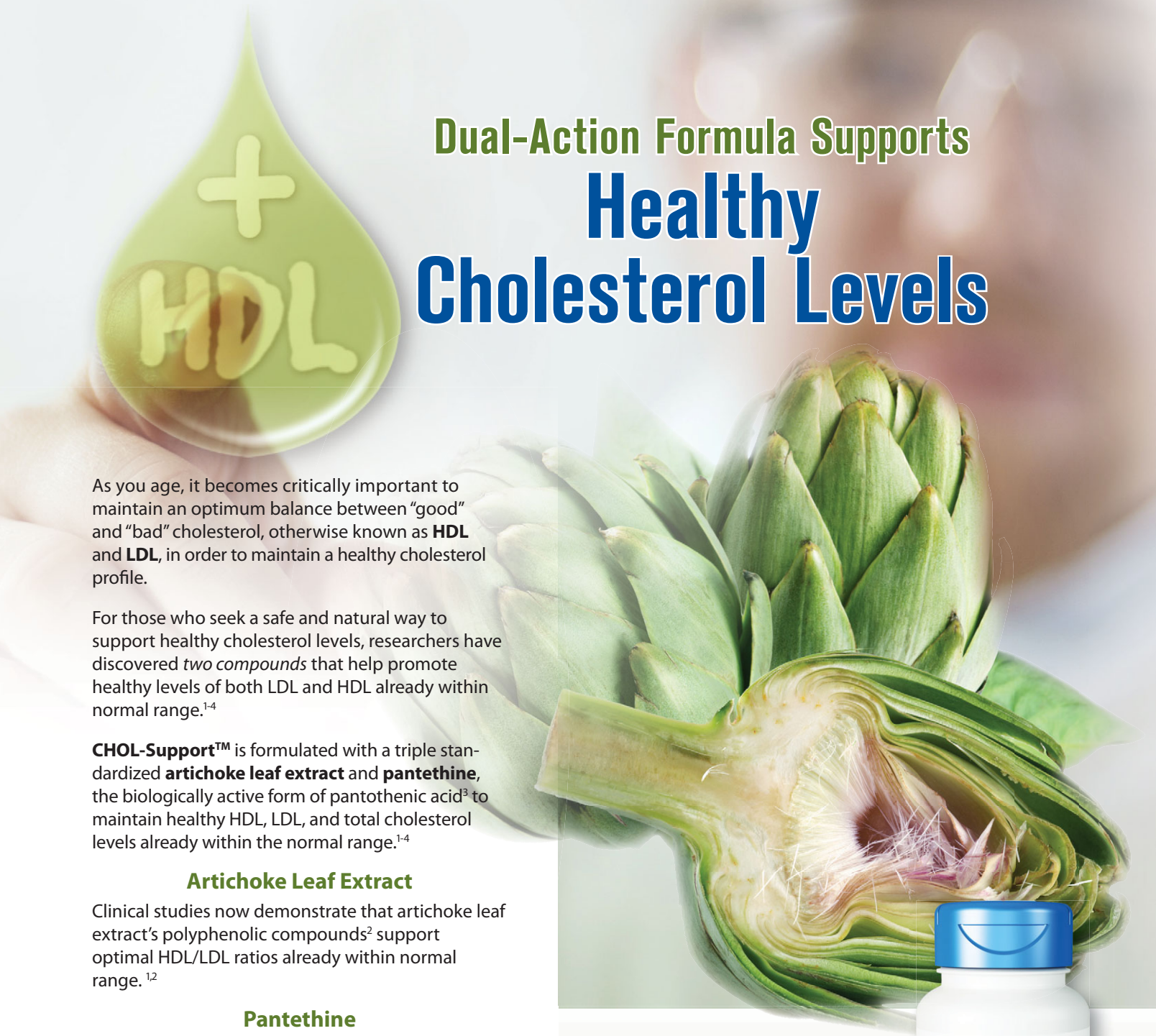

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BY BEN BEST

CONFERENCE REPORT

The 2015 American Society For Nutrition Conference

A good diet is essential for anyone wishing to achieve healthy longevity.

With conflicting stories appearing in the mass media, ascertaining what the best food choices are can be a daunting task.

There is disagreement among nutrition scientists, and there are often new studies or opinions that substantially alter dietary recommendations.

For example, saturated fats have been claimed to cause cardiovascular disease,[1] but this claim is debatable among nutrition scientists.[2-5] Interestingly, on a low-carbohydrate diet, high dietary saturated fats do not increase saturated fats in the bloodstream.[6]

Discussion of the effects of dietary saturated fat rarely acknowledge the fact that there are about a dozen different saturated fats, each of which has unique properties.[7,8] **Palmitate** is the most abundant saturated fat found in foods.[9,10] Palmitate constitutes nearly a third of butterfat and beef fat. Palmitate is more likely to cause inflammation than the other saturated fats[11] (particularly in obese people).[9,12] But palmitate is not inflammatory if consumed with olive oil or fish oil.[13-15] A saturated fat called **myristate** strongly raises blood cholesterol,[16] but the saturated fat **stearate** does not.[17] The saturated fat **butyrate** improves insulin sensitivity.[18]

The human body derives energy either from glucose (from carbohydrate) or from fat (or from ketones from fat).[19] Carbohydrates only became a primary source of energy with the advent of agriculture. As a source of energy, glucose is much more damaging to blood vessels than fat (**saturated fat usually can't be oxidized**). Glucose is the preferred energy source for cancer cells.[20] With the exception of dietary fiber, the fewer carbohydrates in the diet the better, unless there are compensating benefits, such as eating them with blueberries.

Protein is much more complicated. Protein contains essential amino acids, which are important for growth, maintenance, and metabolism of the human body. These functions are especially important for growing children, but are also important for the elderly and to prevent muscle loss in those who exercise. Adequate protein is also important for good immune system function.[21]

Population studies indicate that consumption of red meat and processed meat increases cancer and cardiovascular disease.[22] Subjects randomly assigned to a vegetarian diet or an omnivorous diet had lower blood pressure when on the vegetarian diet.[23] Moderately low protein intake seems advisable for most adults (plant protein preferred), although the amount is hard to specify and is dependent on circumstances.

In seeking a healthy diet, I frequently make substantial changes to my eating patterns. In my search for greater clarity, I attended the ***American Society for Nutrition*** conference in Boston, March 28 to April 1, 2015.

My reports of scientific conferences normally only describe the presentations made by the scientists. But because everyone eats, because diet and dieting have such substantial influence on health, and because the discoveries of nutrition scientists so often seem contradictory or confusing, for this report I am following each presentation description with my interpretations and recommendations. These comments will be my opinions, which are not necessarily those of the Life Extension® Foundation.

My dietary opinions have been substantially influenced by scientists advocating a ketogenic diet, that is, a diet low in carbohydrates, and moderately low in protein. I have been on a vegetarian ketogenic diet for over a year. Insofar as food can only consist of carbohydrate, protein, and fat, my diet is high in fat and fiber. When dietary carbohydrate is low, the liver converts fat into ketones to provide energy for the brain. Although fiber is classified as a carbohydrate, when digested, fiber is converted to beneficial fats in the large intestine.

What do I eat? My "main course" is a vegetable salad (broccoli, green leafy vegetables, shredded cabbage) laden with healthy oil (like olive oil), to which I add walnuts, shredded coconut, and a scoop of whey protein. Among other things I eat are cream cheese with cauliflower, as well as avocado mixed with healthful flavorings such as cocoa powder and wheat grass powder.

Although this is a report on a scientific conference, because diet is such a personal matter, and because I am making recommendations, I need to disclose the basis for my opinions. I believe there is good science behind these opinions, and for that reason I am beginning by reporting the views of Dr. Eric Westman, one of the leading scientific advocates of a ketogenic diet.

Health Benefits Of A Ketogenic Diet

Eric Westman, MD, (Duke University Outpatient Clinic, Durham, North Carolina) is one of the pioneers in challenging the benefits of low-fat diets. He has conducted a number of studies showing that low-carbohydrate, high-fat diets (**ketogenic diets**) result in less hunger, better compliance, and greater **weight loss** than low-fat diets.[24-26]

Dr. Westman conducted a clinical trial in which type II diabetics were randomized to low-calorie diets or to ketogenic diets that did not restrict calories. The diabetics on the ketogenic diet showed greater weight loss, greater reduction in glycated hemoglobin (HbA1C), and greater reduction or elimination of required diabetic medications (**95.2** versus **62%**).[27] Subsequent studies by others have confirmed the benefit of a ketogenic

diet for treatment of type II diabetes.[28,29] Dr. Westman is opening a clinic entirely devoted to weight loss and diabetes treatment using a ketogenic diet (For more information, go to www.healclinics.com).

When carbohydrates are low, the liver converts fats into ketones, which can serve as a fuel source for many tissues, including the brain.[30] Dietary ketosis should not be confused with the ketoacidosis of diabetes, which involves acidity as well as much higher blood ketone concentrations.[31,32] Unlike sugar, which stimulates appetite,[33] ketones reduce appetite.[34,35] As a source of energy for the brain, ketones make mitochondria more efficient, reduce free radical production, and protect against a variety of brain diseases, including epilepsy, stroke, and Alzheimer's disease.[36,37]

A ketogenic diet has been shown to increase cognitive performance in aged rats.[38] Cancer cells thrive on the glucose resulting from dietary carbohydrates, but are generally unable to use ketones as an energy source.[39] Ketones have been shown to suppress tumors and prolong survival in mice that have metastatic cancer.[40,41]

Saturated fats have been claimed to cause cardiovascular disease,[1] but this claim is debatable among nutrition scientists.[2-5] A lot probably depends on the type of saturated fat and what other foods it is consumed with.

Insulin resistance results when excess fat accumulates in muscle, liver, and pancreas rather than in fat cells.[42] But on a carbohydrate-restricted diet, fats are used for energy rather than stored.[6] On a low-carbohydrate diet, high dietary saturated fats do not increase saturated fats in the bloodstream.[6] Cardiovascular risk factors may be reduced on a high-fat, low-carbohydrate (ketogenic) diet,[43,44] and a low-carbohydrate diet has been shown to increase insulin sensitivity.[45,46]

My interpretation/recommendation: A diet low in carbohydrates, moderately low in protein, and high in proper fats is recommended for persons trying to lose weight as well as for prevention and treatment of diabetes (and other age-related afflictions, notably cancer and cardiovascular disease).

Dietary Sugar

Deborah Sloboda, PhD, (Associate Professor, Biochemistry and Biomedical Sciences, McMaster University, Hamilton, Ontario, Canada) does research on the damaging effects of dietary sugar, particularly fructose.

Simple sugar constituted only about **2%** of the prehistoric Paleolithic diet, but currently accounts for about **18** to **25%** of total calories of the average modern Western diet.[47] Modern man is thus consuming about **10 times** more simple sugar than our early ancestors.

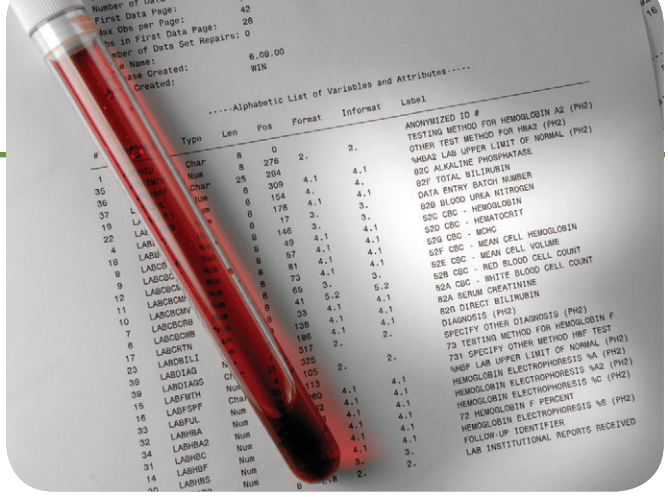
High fructose corn syrup, introduced in 1967, accounted for **42%** of caloric sweeteners being used by the year 2000.[48] Fructose consumption increases visceral (abdominal) fat while reducing insulin sensitivity.[49] Dr. Sloboda is particularly concerned with fructose consumption during pregnancy, which can lead to gestational diabetes (temporary diabetes due to pregnancy), causing inflammatory metabolic disturbance for both the mother and the fetus.[50,51] The amino acid **taurine** can partially reduce the damaging effects of fructose.[51,52]

My interpretation/recommendation: Fructose consumption should be limited because fructose can elevate blood triglycerides while causing insulin resistance and the diseases of inflammation and diabetes. The soft drinks accounting for about **90%** of the soda market (Coca-Cola®, Pepsi®, Dr. Pepper®, Mountain Dew®, and Sprite®) all contain **60** to **65%** fructose.[53] Apple juice has more than twice the fructose as orange juice, yet apple juice is the most common sweetener in fruit drinks. Dried apples, dates, apricots, figs, and raisins are one-quarter to one-third fructose by weight, and should be eaten sparingly. Fructose can cause harm to both the mother and fetus during pregnancy and pregnant women should limit consumption of fructose-containing beverages, and perhaps even supplement with taurine.

Dietary Starch

Diane Birt, PhD, (Distinguished Professor Emeritus, Iowa State University) is interested in using digestion-resistant starch to improve human health. Starch, like sugar, is a form of carbohydrate, but starches that resist digestion in the stomach and small intestine, yet are digested in the large intestine, are called resistant starch or **fiber**.

Dr. Birt has described most foods in the typical Western diet as being highly digestible starches having a high glycemic index (which raise blood glucose).[54] Such



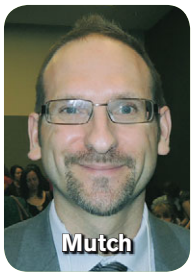
foods result in cycles of high and low blood glucose and blood insulin, often causing insulin resistance and type II diabetes.[54] All starchy foods are composed of chains of sugar molecules, but not all starchy foods are as easily digested. Digestion-resistant starch eaten for breakfast reduces the surges of glucose and insulin at lunch.[55]

Legumes (beans) contain more resistant starch than potatoes, rice, pasta, bread, or breakfast cereals. But Dr. Birt wishes to develop foods with higher resistant starch content than legumes.[54] Resistant starches have been shown to reduce obesity.[56] Starches (dietary fibers) that are more viscous reduce appetite more than those that are less viscous,[57] so the starches she is developing would be more viscous. Starches made of long unbranched chains of sugars are more ***digestion-resistant*** than starches having branched chains, a fact Dr. Birt also exploits when designing improved foods for health.[54]

My interpretation/recommendation: Rapidly digested carbohydrate starches such as potatoes, pastry, white bread, and breakfast cereals should be avoided, but beans and waxy corn starch are good sources of dietary fiber that can satisfy appetite while reducing insulin surges after eating.[54,58]

Dietary Fat

David Mutch, PhD, (Associate Professor, University of Guelph, Canada) is interested in how fats and inflammatory substances in the bloodstream relate to obesity.



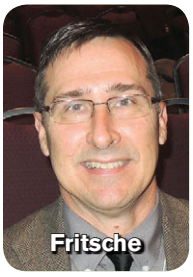
Although obesity is often associated with insulin resistance and metabolic syndrome, he estimates that **13** to **29%** of obese persons (BMI greater than 30) are metabolically healthy, whereas **10** to **37%** of lean persons (BMI less than 25) are metabolically unhealthy, having insulin resistance.[59]

Metabolically healthy obese people are less likely to have fat in heart cells or in the insulin-producing cells of the pancreas.[59] Metabolically unhealthy people have higher blood levels of the saturated fat **palmitate**.[60,61] Foods high in palminate include cocoa butter oil, palm oil, shortening, butter, lard, milk chocolate, fatty meats, pork and beef products, game meats, cashews, and eggs.[61]

Palmitate can induce inflammation and insulin resistance.[62-64] Elevated blood palmitate and glucose cause insulin-producing cells in the pancreas to die, but the **monounsaturated fat** oleic acid (high in **olive oil** and **avocado**) protects cells against glucose and palmitate toxicity.[13,14] ***Omega-3*** fatty acid supplementation of a mouse diet high in saturated fat also prevents inflammation from palmitate.[15]

My interpretation/recommendation: Olive oil, fish oil, and avocado can protect against inflammation due to the saturated fat palmitate.

Kevin Fritsche, PhD, (Professor of Nutritional Immunology, University of Missouri) studies the effects of dietary fats on inflammation and the risk of cardiovascular disease. He believes that the inflammatory blood component ***C-reactive protein*** is more strongly associated with cardiovascular disease than LDL cholesterol.[65] Release of the inflammatory protein IL-18 from fat cells of obese people is triple of that seen in those who are not obese.[66] Although he affirms that ***trans-fatty acids*** promote inflammation and reduce function of the endothelial cells lining blood vessels,[67] he finds not much support for the claim that omega-6 fatty acids are pro-inflammatory.[68,69]



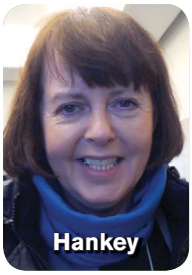
The gut microbe ***Bifidobacteria*** has been shown to prevent the highly pro-inflammatory endotoxin lipopolysaccharide (or LPS, which constitutes **80%** of the cell wall of gram-negative bacteria) from leaking into the bloodstream from the intestine.[70-74] A high-fat, high-carbohydrate diet promotes inflammation by reducing the quantity of *Bifidobacteria*,[73-75] although some foods (including walnuts, olive oil, and wheat bran) can lessen this effect.[76]

The magnitude of inflammation resulting from a high-fat, high-carbohydrate meal is markedly greater in obese than in non-obese subjects.[77,78] Inflammation from a high-fat, high-carbohydrate meal may be independent of LPS concentration in the bloodstream.[79]

My interpretation/recommendation: LDL cholesterol is less of a cardiovascular disease concern than inflammation and insulin resistance. A high-fat diet should be avoided only if it is combined with a diet high in carbohydrates. Dietary carbohydrates cause insulin secretion, and insulin prevents fat from being used as an energy source, resulting in fat being stored in places other than fat cells, namely in muscle and pancreas, resulting in insulin resistance. Because this effect is largest in obesity, obese people should make a particular effort to reduce carbohydrates.

Weight-Loss Strategies

Catherine Hankey, PhD (Senior Lecturer in Human Nutrition, University of Glasgow, United Kingdom) reviewed studies on intermittent fasting as a weight-loss strategy. At any given time, about **40%** of women and **20%** of men will be fasting for weight loss.[80]


Hankey

Dr. Hankey began by acknowledging the bestselling book *The Fast Diet* by Dr. Michael Mosley and Mimi Spencer, which advocates reducing calories to **25%** the usual daily intake on two days each week (Monday and Thursday being the best choice for most people).

A high-protein diet can assist fasting because protein has been shown to reduce appetite.[81] High-protein diets (**25%** or more of calories) are associated with the greatest weight loss (and not much hunger) for a few months. By two years, however, there is little lasting weight loss.[81] A three-month comparison of subjects restricting calories **25%** either on a daily basis with high protein, or only on two days per week with carbohydrate restriction, showed greater body fat reduction along with improved insulin sensitivity for the intermittent-fasting, carbohydrate-restricting group.[82]

My interpretation/recommendation: Complete fasting for more than a day is intolerable for most people, but Dr. Mosley's book became a bestseller because so many people have succeeded in losing weight by eating only **25%** of their usual calories twice weekly. I recommend this book to readers who have not succeeded with other weight-loss methods. The book contains recipes and strategies. Despite initial weight loss and reduction of hunger on a high-protein diet, high-protein diets are not recommended. Weight loss with a high-protein diet is only a temporary effect. Moreover, high dietary protein can result in chronic inflammation with subsequent increase in cancer and cardiovascular disease.[83,84]

Cynthia Kroeger and John Trepanowski, (PhD students, Department of Kinesiology and Nutrition, University of Illinois, Chicago) have conducted a number of studies together on the effects of alternate-day fasting (with **25%** of usual calories consumed on the fast day).[85-87] In one such study, the weight loss from endurance exercise and fasting in combination was compared with exercise and fasting alone. The combination resulted in a 13.2 pound weight loss, fasting alone resulted in a 6.6 pound weight loss, and exercise alone resulted in a 2.2 pound weight loss.[88]

Exercise alone is usually not very effective for weight loss,[89,90] at least partially because of increased appetite. The most important role of exercise in dieting is to prevent loss of lean mass (and to boost AMPK enzyme activity).[91] In another study, Kroeger and Trepanowski found that adding liquid meal replacement to intermittent fasting and calorie restriction resulted in an even greater reduction in weight, visceral fat, and LDL cholesterol. The liquid meals ensured greater portion control. Only the subjects receiving the liquid meal replacement showed a reduction in blood glucose, insulin, and homocysteine, as well as reduced LDL particle size.[86]

My interpretation/recommendation: Although exercise alone is not very effective for weight loss, exercise doubles the weight loss associated with a reduced-calorie diet, while preventing loss of muscle tissue. Combining exercise with calorie restriction is highly recommended for dieters.

Diana Thomas, PhD, (Professor of Mathematical Sciences, Montclair State University, Montclair, New Jersey) has created mathematical models to explain weight-loss effects associated with dieting.[92,93] Weight lost in the initial phases of dieting is typically the result of greater water loss associated with protein and carbohydrate loss.[94] Unlike fat, proteins (like muscle) and carbohydrates (like glycogen) are stored with much water in the body, so loss of lean mass or carbohydrate results in loss of considerable amounts of water.[95,96] Calories required for weight loss increases with the duration of dieting because as dieting proceeds, weight loss increasingly means fat loss. According to Dr. Thomas, after four weeks of dieting, a reduction of about 2,000 dietary calories results in a loss of one pound. But by 24 weeks of dieting, a reduction of about 3,000 dietary calories is required to lose one pound.[94]

For an average person, **resting metabolic rate** accounts for **70%** of calories consumed, physical activity accounts for **20%**, and energy required to digest and metabolize food (the **thermic effect of food)** accounts for **10%**.[97]

The thermic effect of protein is more than double the thermic effect of fat or carbohydrate.[98] The thermic effect of glucose is reduced with insulin resistance because insulin facilitates glucose storage (which consumes more energy than glucose used as an energy source).[99]

Resting metabolic rate typically declines **2** to **3%** every decade after age 20, mostly due to loss of lean, fat-free mass.[97] Physical activity also tends to decline with age. These factors make weight loss increasingly difficult with age. On average, body weight is highest for those in the 50-59 age group, but much of the reason for this may be due to higher death rates among the obese.[97]

My interpretation/recommendation: Weight loss becomes more difficult with age largely because of the muscle loss associated with reduced activity. The more

muscle (lean body mass) that a person has, the higher their resting metabolic rate will be. Resistance exercise is particularly important for building and maintaining muscle, as well as preventing the frailty too often associated with aging. Exercise should become a lifetime practice, not simply something done while dieting.

Muscle Loss In The Elderly

Ronenn Roubenoff, MD, (Internist, Tufts Medical Center, Boston) studies muscle loss in the elderly. He cited a three-year study of over 3,000 people in their 70s, which showed that loss of muscle quality was even greater than loss of muscle mass.[100] Deterioration of muscle in the elderly not only leads to functional impairment and falls, but to chronic heart failure and chronic obstructive pulmonary disease.[101-103] Endurance as well as resistance exercise, along with increased protein intake is recommended to prevent muscular atrophy in the elderly,[104] although those with kidney problems due to diabetes may need to limit their protein intake.[105]


Roubenoff

My interpretation/recommendation: As stated above, endurance exercise, resistance exercise, and adequate protein can prevent muscle wasting and can reduce frailty in the elderly (for whom muscle-wasting can be life threatening).

Circadian Rhythm And Diet

Frank Scheer, PhD, (Assistant Professor of Sleep Medicine, Harvard Medical School) is an expert on the effects of circadian (day-night cycle) rhythm on dietary metabolism. The brain has a clock that normally causes **melatonin** secretion to increase in the evening (facilitating sleep), which causes secretion of growth hormone and prolactin at sleep onset, and which causes secretion of the stress hormone **cortisol** before awakening.[106] The risk of a heart attack in the morning is elevated **40%** above the 24-hour average,[106] at least partially because cortisol raises blood pressure.[107] Dr. Scheer's research has established that disruption of the circadian rhythm by jet lag or shift work leads to insulin resistance.[108] Melatonin supplementation can lessen these circadian stresses.[109]

Dr. Scheer has also established that for those with a normal circadian rhythm, hunger is lowest at 8 a.m. and highest at 8 p.m.[110] There is also a circadian effect on appetite for certain foods. The 8 p.m. appetite for sweets, starches, and meat is increased, but there is no circadian effect for vegetables or dairy products.[110]

Dr. Scheer conducted two studies showing that breakfast skippers and late eaters gain more weight (and have more trouble losing weight) than early eaters, despite consuming the same total number of calories.[111,112] But a randomized study focused only on those who skip breakfast showed no effect on weight gain or loss.[113] A review by other authors, while acknowledging that late-night eating contributes to metabolic syndrome, denied a similar effect for breakfast skipping, suggesting that breakfast skipping might be more successful than other strategies for calorie restriction.[114]

My interpretation/recommendation: Eating in the evening before bedtime can lead to greater weight gain than calorie counting would predict. Skipping breakfast is probably not a health hazard. Melatonin should be used to reduce the effects of jet lag or shift work.

Conclusions

There may be a revolution happening in the perception of the effects of dietary fat, especially in the context of a ketogenic diet. It would be hard to prove that the US Department of Agriculture dietary recommendations of high grain (carbohydrate, the "food pyramid") and low fat[115,116] contributed significantly to the current obesity epidemic, but if true, the government will not readily admit blame.[117] ●

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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NEW HIGHLY PURIFIED
ALASKAN FISH OIL

The health benefits of eating **cold-water fish** are robust, yet concerns remain about **contaminants** found in wild and farm-raised fish.

This should not stop consumers from including fish in their diet, as the longevity advantages of consuming cold-water **fish** instead of foods like **beef** are substantial.

A recent study found that even **vegetarians** that include some **fish** in their diet fare better than strict vegetarians.[1]

Eliminate Virtually All Fish-Derived Toxins

Consumers can exert significant control over their exposure to fish-borne toxins.

High-quality **fish oil** is distilled to remove synthetic and natural contaminants that existed in the **fish** itself. Enhanced molecular distillation techniques utilize redundant processes to virtually eliminate detectable environmental toxins.

The other safety concern about fish oil is that its delicate ***omega-3 fats*** are highly vulnerable to **rancidity**. No one wants to ingest oxidized (rancid) oils.

A new fish oil blend derived from pristine waters off the coast of **Alaska** utilizes a **multistep** process to remain exceptionally **fresh**. The result is that this **Alaskan-derived** fish oil has a greater than **5-fold** reduction in the upper level threshold measurement for **oxidation**.

Current oxidation standards for quality fish oils ensure products free from rancidity. The new **Alaskan-derived** fish oil specification advances this premium standard **5-fold** better!

The chart below reveals the reduction in upper limit for **oxidation** of this new **Alaskan fish oil** blend over existing ***quality*** fish oils:

Higher Percentages Of EPA And DHA

An advantage to higher EPA and DHA fish oil concentrations is smaller sized omega-3 softgels.

The addition of this new **Alaskan-derived** fish oil to the ***Super Omega-3*** supplement group enables the same high-potency **EPA/DHA** to fit into slightly smaller softgels for easier swallowing.

International Fish Oil Association "Five-Star Rating"

The **International Fish Oil Association** (IFOS) is an independent organization that tests fish oils to determine their overall safety and quality. A **Five-Star Rating** indicates fish oils have been tested to meet very strict standards of quality as determined by EPA and DHA content, and for purity to rule out contamination with heavy metals, radiation, oxidation, and organic pollutants such as PCBs and dioxin.

The new **Alaskan-derived** fish oil enjoys the same **Five-Star Rating** mandated for all fish oils contained in the ***Super Omega-3*** family of supplements.

Sustainable Fishing

The **Marine Stewardship Council** is an independent nonprofit organization that sets a standard for **sustainable fishing** so that fishing can continue indefinitely with minimal environmental impact.

The new **Alaskan-derived** fish oil is the first refined omega-3 concentrate available worldwide that carries the prestigious **seafood sustainability** certification from the Marine Stewardship Council.

	Alaskan-Derived Specification	Current High-Quality Specification
TOTOX (total oxidation value) (Lower means less oxidation)	**Maximum: 5**	**Maximum: 26**
PEROXIDE LEVEL (Measure of current oxidation)	**Max: 1.0 meq/kg**	**Max: 5.0 meq/kg**
ANISIDINE LEVEL (Measure of past oxidation and measure of aldehyde production during handling and storage)	**Maximum: 5**	**Maximum: 20**

Most Advanced Omega-3 Dietary Supplement

From supporting **heart health** and **brain function** to balancing the **inflammatory** response, there is no debating the broad-spectrum benefits of **omega-3** fatty acids.[2-4]

There are hundreds of fish oil supplements on the market. Only one incorporates lifesaving findings to provide **omega-3** and **olive fruit** extracts, along with **sesame lignans**, in a family of formulas called **Super Omega-3**.

Fish Oil + Olive Fruit Extract = Greater Efficacy!

Research findings indicate that a combination of **fish oil** and **olive oil** can support a healthy inflammatory response better than fish oil alone.[5] **Super Omega-3** incorporates the benefits of both fish oil and olive fruit extract into a single novel formula. A four softgel serving supplies the equivalent polyphenol content of **8** to **12** tablespoons of **extra virgin olive oil**.

Sesame Lignans Enhance Fish Oil Efficacy

Studies show that when **sesame lignans** are added to **fish oil**, there is a greater safeguard against **oxidation** along with the EPA/DHA fatty acids being directed toward pathways that help with inflammatory reactions.[6]

Benefits Of A Mediterranean Diet

The most popular ***Super Omega-3*** formula provides the following potencies of Mediterranean health benefits in just four smaller softgel capsules:

Four softgels contain:

Alaskan Wild Fish Oil Concentrate		**4,000 mg**
Omega-3s		**2,400 mg**
EPA	1,400 mg	
DHA	1,000 mg	
Polyphen-Oil™ Olive extract (fruit and leaf)		**600 mg**
Sesame seed lignan extract		**20 mg**

To order Super Omega-3, call 1-800-544-4440 or visit www.LifeExtension.com

Super Omega-3
Item #01982 • 120 softgels

	Retail Price	Your Price
1 bottle	$32	**$24**
4 bottles		**$21** each
10 bottles		**$17.05** each

Non-GMO

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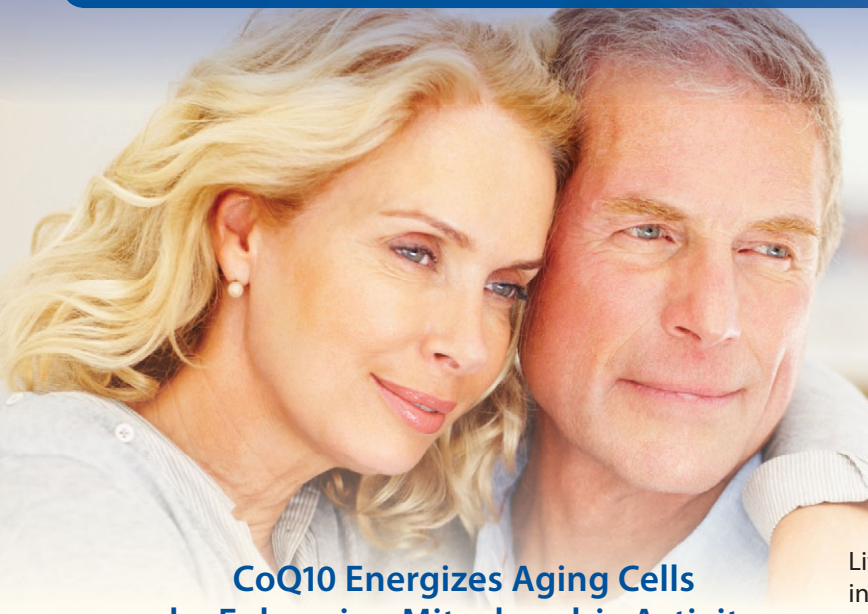
Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

MAINTAIN YOUTHFUL MITOCHONDRIA FUNCTION



The Most Effective Form Of CoQ10

CoQ10 Energizes Aging Cells by Enhancing Mitochondria Activity

Published studies on CoQ10 absorption clearly show that **ubiquinol** CoQ10 is superior to the conventional ubiquinone form. In middle-age mice, **ubiquinol** proved **40%** more effective in slowing measurements of aging compared to ubiquinone.[1]

A 2014 study further validates that **ubiquinol** activates mitochondrial functions to slow aging in mouse models.[2]

Life Extension® goes one step further and adds **shilajit** to its ubiquinol formula in a product called **Super Ubiquinol CoQ10**. Shilajit has been shown to promote mitochondrial metabolism, helping mitochondria convert fats and sugars into ATP—the main source of cellular energy.[3-8] When combined with **ubiquinol** CoQ10, it has been shown to **double** levels of CoQ10 in the mitochondria.[9]

The latest studies reveal that when **shilajit** is combined with CoQ10, cellular energy substantially increases. Combining the two ingredients produced a **56%** increase in energy production in the brain—**40%** more than CoQ10 alone! In the muscles, there was a **144%** increase![10]

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Life Extension® combines these two energy-activating ingredients in an exclusive **ubiquinol-shilajit** formulation available in three different potencies:

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1 bottle	$62	**$46.50**
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Manage Chronic Pain With Natural Therapies

Dr. Chris Kleronomos

A study published in the *Journal of Pain* reports that **19%** of American adults–almost one in five–suffer from persistent pain. Among people over 60, that portion reaches almost **30%**.[1] Most doctors approach pain problems with a prescription pad, without ever considering other factors that can help mitigate and eventually end chronic pain. But Dr. Chris Kleronomos is an exception. He is a doctor of acupuncture and Oriental medicine, a nurse practitioner, and clinical director of the Fibromyalgia and Neuromuscular Pain Center of Oregon. In a thoroughly comprehensive approach to pain management, Dr. Kleronomos' clinic incorporates natural medicine, acupuncture, chiropractic, psychology, diet, biofeedback, injections, bee venom therapy, functional nutrition, and many other therapies. For those unable to visit his Salem, Oregon, clinic, he recently agreed to answer some questions for us about chronic pain and how it can be safely alleviated.

LE: You started out treating pain as a Navy Corpsman and now operate a multimodal pain management clinic focused on therapies rooted in traditional and natural medicine. Can you explain how you first became interested in this field and the journey to where you are now?

CK: Yes, I was a Special Amphibious Reconnaissance Corpsman with the Marine Corp's elite Force Recon unit. So my interest [in pain management] was really born of the necessity to have field medical and survival options available—since we would often be alone and unsupported for extended periods. I began studying herbal therapies and natural techniques that indigenous people had used when fighting guerilla wars. When I got out of the service, I continued that journey with a Master's in Traditional Chinese Medicine. I then spent time in Southeast Asia working in animal conservation and learned directly from the indigenous people who worked for me. I eventually came back to the States and completed a doctoral program that focused on advanced natural therapies for oncology, chronic disease, and pain management. Due to my belief in integrated medicine, I went on to become an Advanced Practice Nurse Practitioner and eventually, completed an additional Master of Science in Functional Medicine and Clinical Nutrition.

LE: Many people suffer for years, even the rest of their lives, with chronic pain as a result of incurable conditions such as rheumatoid arthritis or fibromyalgia. Since pain medications seldom provide complete relief, are there other options for these patients?

CK: Lots of options are available for these people, and the research clearly shows that multimodal approaches produce the best outcomes. There is no "magic bullet." Diet therapy, in my opinion, is critical. Over the last several decades, we have seen a huge increase in allergies, asthma, and autoimmune disease, and it has been identified that chronic inflammation plays a critical role. Specific options such as acupuncture, chiropractic, psychology, hydrotherapy, supplements, and herbs all depend on the individual patient and the situation. Not every option works for everyone—just as not every medication works—and finding the right combination can be challenging. We approach every person as a unique case.

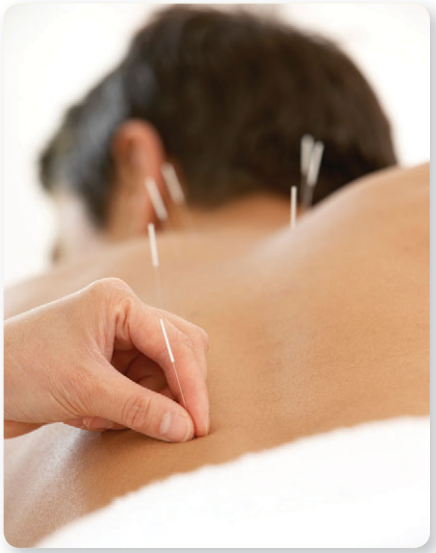
LE: Long-range side effects, or the risk of them, cause many patients to stop using, or cut back on, pain drugs. Clearly, patients are better off with an effective program of supplements and herbs, right?

CK: The majority of supplements and herbs are safe, but they still must be [used] appropriately and in context of the patient's condition and his or her other medications. Many supplements and herbs treat the contributing mechanisms of pain, such as inflammation or muscle spasms, help to reduce or prevent the escalation of pain medication dosing, or even increase the effect. Another strategy is to use supplements and herbs to address the associated side effects, such as anxiety or insomnia.

LE: Many chronic pain sufferers find that drug painkillers dull, but don't eliminate, their pain. Surely, natural pain relievers cannot provide stronger pain suppression, can they?

CK: Generally speaking, the cumulative evidence for supplements and herbs is limited but excellent for what *has* been studied. My experience is that natural pain relievers can be as effective, and since they are applied differently and in combination, they can sometimes be stronger. It is really a matter of perspective. A narcotic medication has a strong, specifically targeted effect, but does not always address the root or underlying problem. For example, *Corydalis*, the classic "pain" herb is said to have a **1%** equivalency to morphine—but it's also anti-inflammatory, decreases blood viscosity, and acts as a mild sedative and muscle relaxant, in addition to having some adaptogenic or balancing properties to the system. So, in many ways, it could be considered superior to prescription medications.

LE: Anti-inflammatory medicines such as aspirin, ibuprofen, or naproxen work by blocking the enzymes that trigger inflammation, swelling, and pain. Do nutritional and herbal supplements generally work by modulating the same mechanisms or by other, novel pathways?



Fibromyalgia: What Causes–And What Is–This Source Of Chronic Pain?

Although it is a common source of chronic pain, fibromyalgia is a disease that–unlike other painful conditions such as arthritis–does not show up on X-rays or in blood-work. Unfortunately, there is no lab test to confirm the diagnosis of fibromyalgia. It is primarily a diagnosis of exclusion, which means that other diseases and disorders must first be ruled out.

Although it is not well understood, fibromyalgia is identified as a neurosensory disorder characterized by disturbances in the way the central nervous system interprets and evaluates stimuli.[2]

Typically, it is associated with other regional pain syndromes, as well as mood and anxiety disorders. In fact, significant data supports the idea that fibromyalgia, chronic fatigue syndrome, regional chronic pain syndromes, and some emotional disorders all involve abnormal perturbations of the stress response system.[3,4]

Because many fibromyalgia patients appear well on physical examination, the diagnosis of fibromyalgia was historically considered controversial and unfortunately, written off by many conventional physicians as a psychosomatic condition.[5,6]

We asked Dr. Kleronomos to provide his assessment of the possible origins and mechanisms of fibromyalgia. Here is his analysis of the complexities of this source of chronic pain:

"Currently there is no definitive theory of fibromyalgia. Some critical aspects include increased central sensitization, altered pain signaling, sensory processing issues, hypothalamus-pituitary-adrenal dysfunction, and neurotransmitter imbalance.

"Emerging research performed by our psychologist, who is also my wife, has identified the relationship between 'dual-trauma' exposure–having a trauma in both childhood and adulthood–and the development of fibromyalgia. [It] showed that the cascade of endocrine changes seen in severe trauma was similar in fibromyalgia patients, further supporting the concept of changes in brain neuroplasticity [your brain's ability to reorganize itself by forming new neural connections throughout life].

"My working theory is that there are **four** primary presentations of fibromyalgia, each with overlapping features.

- Gut-mediated: This is associated with food sensitivities, dysbiosis [microbial imbalance on or inside the body], and leaky gut–which, admittedly, is a 'chicken-and-the-egg' pattern and tends to be the most predominant in long-standing cases.
- Structural: Typically, it has an onset of a triggering event, even a minor one, such as a car accident or a fall, and it may be the result of a long-standing, peripheral injury that became centralized or more widespread.
- Psychogenic: This is related to neuroplasticity [and results] from sustained stress and trauma and shows increased activity in limbic structures [brain structures that govern emotions and behavior].
- Metabolic/nutrient: This is really 'pseudo-fibromyalgia syndrome,' resulting from deconditioning [a physiological decline in function], systemic inflammation, nutrient deficiencies, and other organic issues such as anemia, hypothyroidism, or chronic infections.

"The specific protocol we use at our clinic can ferret out what presentation it is–and address each in a variety of ways."

CK: [It depends.] Willow bark (*Salix* Spp.), from which modern aspirin is derived, has generally the same effects as the pharmaceutical. It has strong, graded evidence for use, but we know the analgesic actions are typically slow-acting, yet last longer than standard aspirin products. *Boswellia* spp., a resinous herb with a long history, has demonstrated in animal studies an analgesic effect comparable to a moderate dose of morphine, but it's known to also inhibit both of the major inflammatory pathways. Turmeric (*Curcumin* Spp.) is gaining lots of attention for its health and anti-inflammatory benefits. It does this by selectively inhibiting both major pathways of inflammation and the resulting downstream chemical triggers of inflammation. Interestingly, it also increases the potency of standard pharmaceutical nonsteroidal anti-inflammatory drugs, such as celecoxib. It has a variety of other health benefits, acting as a free radical scavenger, antineoplastic [tumor-inhibitor], antimicrobial, and it improves cholesterol synthesis.

LE: You provide a wide range of in-clinic therapies, such as injections. Can you give us an outline of these diverse therapies?

CK: Our clinic employs a variety of techniques. We use acupuncture, chiropractic, and physical modalities such as cupping, gua sha [instrument-assisted scraping of the skin], and Graston [a patented, instrument-assisted technique for breaking up scar tissue]. I also use several injection therapies, including trigger point muscle injections [injections into muscle knots], utilizing a combination of natural substances—such as MSM—and anesthetic, as well as prolotherapy [injection

of irritating substances] for the neck, back, and joints. I'm probably most well-known, however, for the use of bee venom therapy. Bee venom, sometimes called apipuncture, has documented use going back thousands of years. Charlemagne is said to have used it to treat his gout during the Crusades, and Alexander the Great reportedly used it for chronic hip pain. Modern research is now able to validate the mechanisms of its action, which includes blocking peripheral pain-signaling, anti-inflammation, central or brain modulation of pain, and immune regulation. Classically, it has been best known [to be] utilized for arthritic conditions, and in the US, has a following for use in multiple sclerosis. I have found it extremely effective for multiple pain conditions including fibromyalgia, rheumatoid arthritis, lupus, and complex regional pain syndrome.

LE: Aside from these in-clinic pain therapies, can you explain what supplement options are available that effectively treat chronic pain?

CK: A good, basic start is a whole-food multivitamin—some data suggests that you would need 27,000 calories to meet all of the recommended daily intake for micronutrients.[7] This accounts for the most common nutrient deficiencies in the US, which are iron, calcium, magnesium, and D and B vitamins. Generally, I believe that most people need foundation support, depending on how good their diet is, where they live, and what underlying issues they have: an average dose of **4,000 IU** daily of vitamin D3; **2,000** to **3,000 mg** daily of omega-3; multi-strain live probiotic; and active B vitamins in methylated forms. Also, a multimineral with calcium (**600 mg twice** daily), magnesium (**1,000** to **2,000 mg** daily), and zinc (**20 mg** daily), particularly if currently on an antacid medication or diuretic. I [have my patients] use iron with vitamin C if there is anemia, but I am cautious if there is a lot of inflammation. I always add CoQ10 (**100** to **300 mg**), especially if they are on a statin drug. Other basics include glucosamine, chondroitin, and MSM, especially if there are degenerative changes. Selenium is a good option if [patients] have a thyroid issue—**55 micrograms** as basic, **200 micrograms** if autoimmune. Using either NAC [N-acetyl cysteine] or glutathione can be useful. Green tea and garlic should be included in most people's regimen, either in food form or extract. These herbs have very broad effects that target several aspects of health. Green tea or EGCG can induce repair of cells at all stages of the cell cycle.

LE: You said that treatment choices depend on the individual patient. Do supplement recommendations also vary with each individual case?

CK: Yes. The individual's body effect on the supplement or herb—called pharmacokinetics—is important. This can include sensitivities to fillers or the initial source from which it was derived, the amount of stomach acid available to break it down, and the integrity of the gastrointestinal tract, particularly the health of the microbiome. Individual genetics play an important role, especially in B vitamin synthesis, cellular energy production, detoxification, and in the CYP450 system, which is the liver's ability to process and detoxify.

LE: Is it safe to mix traditional drug pain relievers with supplement pain remedies?

CK: Yes, a review of the literature demonstrated that beliefs about herb-drug interactions are mainly theoretical considerations and not clinically observed facts. Drug interactions with herbs or nutrients do occur, but occur equally to common foods such as broccoli, grapefruit juice, and alcohol. This is also true of cigarette smoking. Certainly, it's far less of a problem than the over one million [Americans] injured or killed directly related to prescription medication error.

LE: Is exercising helpful and for what painful conditions?

CK: I often say that "motion is lotion." No question: Exercise is important for a lot of issues relating to chronic pain, including depression and anxiety. It's suitable for most chronic pain conditions in which furthering structural damage is not a risk—and for those risks, we recommend guidance from a physical therapist. Exercise helps strengthen the core, stabilize structures such as the spine and joints, and improve posture, and it's also important for reducing negative metabolic consequences such as obesity, high blood pressure, elevated blood sugar, and cholesterol. It even improves cellular energy production by the mitochondria…the recommendation is to maintain a moderate activity level overall, combining various activities such as walking, warm water swimming, and yoga.

LE: Beyond supplements and exercise, do any other lifestyle changes improve pain?

CK: A healthy diet…addresses multiple systems simultaneously to

reestablish and support the body's ability to repair and heal. Many studies show that people who eat certain types of foods are less likely to have health issues. Although many fad diets are in the marketplace, there is a common theme of removing potentially problematic foods, increasing micronutrients, restoring healthy gut flora, and reestablishing an appropriate omega-6:omega-3 ratio to decrease inflammation. Carbohydrate restriction and avoidance of refined, processed, and GMO foods is a good start. Generally, anything that decreases depression, anxiety, and focuses on the health condition is helpful—including meditation, stress management, community activities, hobbies, recreational activities, time in nature, and relationships with family and friends. We [use] cognitive behavioral techniques, biofeedback, mindfulness, relaxation exercises, and guided imagery.

LE: For many patients, medical practitioners cannot identify a clear cause. Is there any way to track down the source of their pain?

CK: For complex conditions, there are multiple pieces to the pain "puzzle." I find a functional medicine approach [focusing on interactions between the environment and the gastrointestinal, endocrine, and immune systems] to be the most efficient in seeking antecedents, triggers, and mediators of the condition. I also look at blood work differently in an attempt to identify patterns. Specialized tests can be useful, such as salivary adrenal and hormone profiles, micronutrient assays, and stool analysis. I [emphasize] finding the underlying dysfunction and correction of systems-level concerns.

LE: Should people who are on blood-thinning drugs check with their doctor before using pain supplements?

CK: Yes, it's important to have a partnership with your health care provider before starting an herb or supplement regimen—research everything and ask questions. Although the evidence is not overwhelming for interactions, adverse effects have been documented. This is the one area where even food can have an impact.

LE: Very informative. Thank you.

CK: My pleasure. ●

For more information on Dr. Chris Kleronomos, or on the Fibromyalgia and Neuromuscular Pain Center of Oregon, visit http://pain-puzzle.com/ or call 1-844-724-6789.

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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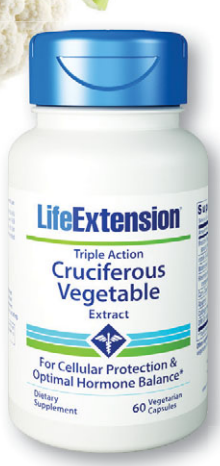

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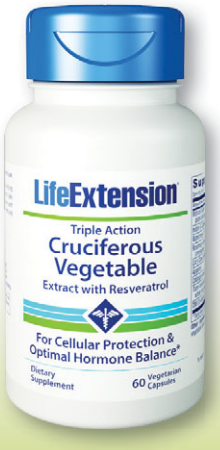

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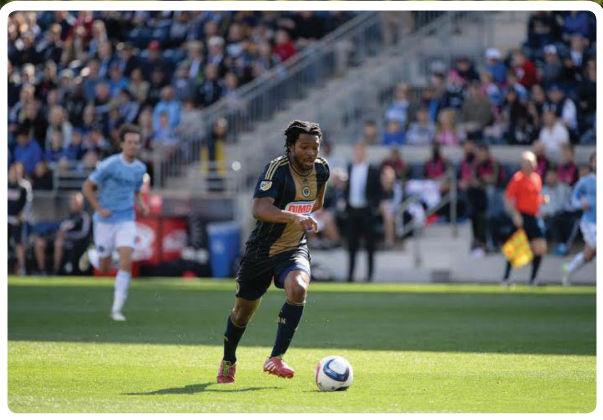


SOCCER SUPERSTAR

MICHAEL LAHOUD

SAYS VITAMIN D IMPROVED HIS STAMINA AND HIS GAME

Soccer star Michael Lahoud was nearing 30 and wanted an edge.

"When I played in college, youth and talent got me through," says Philadelphia Union midfielder, 29, who graduated from Wake Forest University in 2008 and was a first-round draft pick for Chivas USA, a former Major League Soccer team based in Los Angeles, before joining Union three years ago.

"By the end of college, I'd stopped drinking soda and eating fast food. But that was pretty much it as far as taking care of myself. When you excel as an athlete, you're told most of your life how special and talented you are. But at the professional level, you realize that everyone's special and talented, and in order to consistently stay at the top of your game, you have to do something more."

Remarkable Results

What Lahoud did, upon the advice of Union strength-and-conditioning coach Kevin Miller, was to begin supplementing with vitamin D. And the results, the player says, have been remarkable.

"I noticed an immediate impact within about two weeks, especially more energy," he says. "But not in the sense of drinking an energy booster and getting a jolt—energy in a consistent, sustained way. I'm not a morning person by trade, but I get paid to be a morning person, and I started to feel less foggy when I got woke up. I could dedicate that extra energy to doing more training and the other work that a good pro needs to do."

Vitamin D has long been linked to strong bones by aiding in the metabolism of calcium. It also may help lower the risk of degenerative disease. By directly influencing over 200 human genes, vitamin D notably binds to many genes associated with autoimmune disease and cancer, which has researchers studying vitamin D's potential benefits beyond bone health. The versatile vitamin is also involved in muscle function, the respiratory system, and brain development.

"I'm always reading about supplements because as a coach, you're constantly looking for ways to give your players an advantage," says Kevin Miller. "Obviously strong bones are important. But power, speed, and recovery from exertion are also key factors. Anything that can reduce the chance of injury or illness is critical when it comes to an athlete."

Team Credits Vitamin D For Its Comeback

Vitamin D started to gain locker-room respect about five years ago after the Chicago Blackhawks, following a 50-year championship drought, won the Stanley Cup in 2010. The hockey team credited its comeback, in part, to significantly fewer injuries after most players started taking a daily **5,000 IU** vitamin D supplement that season. (The Blackhawks captured the Cup again three years later.)

Study Shows Effects

Also in 2010, researchers measured the vitamin D levels of all 89 New York Giants football players in the spring, then compared the results to data on players who'd missed a game or practice during the previous season due to injury. The results, presented in 2011 at the annual meeting of the American Orthopaedic Society for Sports Medicine in San Diego, showed that the average vitamin D level of players who sustained injuries was about **20%** lower than that of uninjured players regardless of age, height, weight, or body mass index (BMI).

"I was watching the Blackhawks while they were on their way to winning the Stanley Cup the second time, and they mentioned vitamin D again," Lahoud says, referring to the hockey team's 2012-2013 season. "It was funny to think that they turned themselves around with a supplement. I was really inspired by their story, and after we had a rough start to our season, [Coach Miller] brought up vitamin D, and he started the vitamin D challenge."

Miller asked Union players to take a blood test to measure their initial levels of vitamin D and then challenged them to increase their numbers.

"My number one goal for the players is to keep them healthy," says Miller. "Michael was great. He supplemented for about a year, and after we had the whole team tested again, he had the highest score."

Lahoud noted that dark skin makes it even harder to maintain adequate vitamin D levels because it inhibits ultraviolet B (UVB) radiation from sunlight, which is a precursor to the body making vitamin D. "After I began supplementing, my levels rose into the **80s (ng/dL)**," he says.

Coach Kevin Miller

Recommended Dosages

Nutritional scientists recommend an optimal 25-hydroxy vitamin D blood level of between **50 ng/mL** to **80 ng/mL**.

The current daily Recommended Dietary Allowance (RDA) of vitamin D is only **600 IU**, but widespread evidence of vitamin D deficiencies prompted researchers to increase that number to a daily intake of **1,000 IU**. Life Extension® suggests that healthy adults supplement each day with **2,000-8,000 IU** of vitamin D and have a blood test done to measure ***25-hydroxyvitamin D*** levels about 45 days later.

Miller, 43, a Union coach since 2010, is not just a trainer but also a triathlete who pursues peak fitness. He has competed three times in the grueling Ironman Lake Placid in New York and says that he, too, has experienced the performance boost of vitamin D.

"I recall reading about vitamin D in *Life Extension* magazine, but I hadn't taken any myself at the time. The article recommended supplementing even if you spend time in the sun because of the weather, sunblock, and other things that affect your body's ability to produce an optimal level. I know Life Extension® is a very reputable company with safe products, so that's the brand I recommend."

Lahoud, for example, takes Life Extension®'s **Vitamins D and K with Sea-Iodine™**, which contains **5,000 IU** of D to facilitate calcium absorption into the bloodstream and **2,100 mcg** of vitamin K to transport calcium from the bloodstream into the bone. The midfielder, at Miller's recommendation, also takes L-carnitine, curcumin, zinc, and fish oil.

Feeling Fit On The Field

"I feel more prepared when I take my supplements every day," says Lahoud, an American citizen who plays internationally for his native country of Sierra Leone in high-profile tournaments such as the Africa Cup of Nations. "I sometimes have very long travel days to compete against the best players in the world, and I get an extra sense of being ready for the world stage if I take supplements on a regular basis."

The defensive powerhouse, who says his position requires him to be one of the fittest on the field, emphasizes that you don't have to be a professional athlete to benefit from vitamin D.

"It's about doing your best consistently, whether you're a sports star, business leader, or just an everyday person. The way to do that is to create and stick to habits that involve taking care of yourself, including nutritional support. I've seen firsthand that vitamin D gives you the energy and focus to handle whatever life throws at you."

Benefits Of Vitamin D

Vitamin D is essential for calcium absorption as well as the maintenance of healthy bones and teeth. It also provides a protective effect against many diseases and conditions, such as type I diabetes and multiple sclerosis. Researchers also say that the steroid hormone:

- Boosts immunity,
- Supports the brain and nervous system,
- Regulates insulin levels,
- Strengthens lung function and heart health, and
- Influences the expression of genes involved in cancer growth. ●

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

Top Off Your TESTOSTERONE *Naturally*

Low Testosterone Levels May Lead to:

- **Reduced Sex Drive**
- **Less Energy**
- **Cloudy Thinking**
- **Weight Gain**
- **Cardiovascular Issues**

Maintaining healthy testosterone levels is one of the most important steps you can take to regain your health and improve your performance. With research showing that by the time a man is 70 years old, he may produce **60%** less testosterone than he did at age 40, the time is now to add Life Extension®'s **Super MiraForte with Standardized Lignans** to your supplement regimen.

Super Miraforte with Standardized Lignans • Item #01698 • 120 capsules

	Retail Price	Your Price
1 bottle	$62	**$46.50**
4 bottles		**$42 each**

Non-GMO

Each daily dose of **Super MiraForte with Standardized Lignans** contains the following testosterone supporting ingredients:

Chrysin	**1,500 mg**
Bioperine®	**15 mg**
Muira puama	**850 mg**
Nettle root	**282 mg**
Chelated elemental zinc	**15 mg**
Maca	**320 mg**
HMRlignan™ Norway Spruce lignan extract	**33.4 mg**

To order **Super MiraForte with Standardized Lignans** call **1-800-544-4440** or visit **www.LifeExtension.com**

Super Health. Super Libido. *Super MiraForte.*

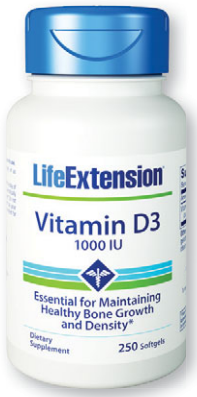
Caution: If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product. Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

D3

VITAMIN D3 SOFTGELS

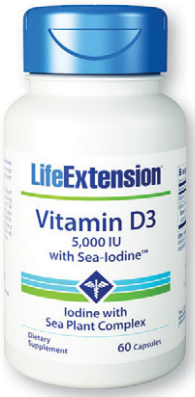
For Superior Absorption

New research on the vital benefits of **vitamin D** emerges on a daily basis. Studies confirm that **optimal** levels of vitamin D are in the range of **50-80 ng/mL** of **25-hydroxy vitamin D.** **Life Extension**® has created a large selection of highly *absorbable* **vitamin D** supplements in softgels to help you to achieve your individual **vitamin D goals.** Keep in mind that you may already be getting **1,000-3,000 IU** of **vitamin D** in your current multi-nutrient formulas.



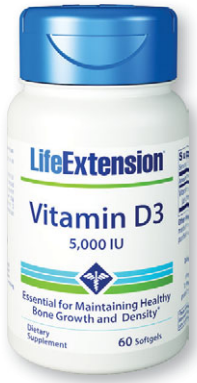
Vitamin D3 • 1,000 IU

250 softgels • Retail: $12.50
Four bottles: **$8.44** ea.
For most people, a **1,000 IU** potency is insufficient to attain optimal **vitamin D** blood levels. However, this potency may be suitable for smaller individuals who obtain **2,000-3,000 IU** in their multi-nutrient formulas (and children). **Item # 01751**
Non-GMO.



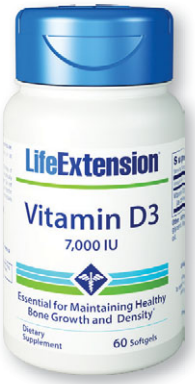
Vitamin D3 • 5,000 IU With Sea-Iodine™*

60 capsules (non-softgel) • Retail: $14
Four bottles: **$9.38** ea.
Most people, especially those seeking to reduce their salt intake, do not ingest enough iodine. Combining **5,000 IU** of **vitamin D3** with **1,000 mcg** of **iodine** into one capsule makes taking these two nutrients economical and convenient. *Due to the source of kelp, this product may contain fish and shellfish.* **Item # 01758**



Vitamin D3 • 5,000 IU

60 softgels • Retail: $11
Four bottles: **$7.43** ea.
For those already obtaining **1,000-3,000 IU** of **vitamin D** in their multi-nutrient formulas, this **5,000 IU** potency is what may be needed to achieve optimal blood levels. **Item # 01713**
Non-GMO.



Vitamin D3 • 7,000 IU

60 softgels • Retail: $14
Four bottles: **$9.45** ea.
Some people (such as those weighing more than 180 pounds) may require even more **vitamin D**. When combined with **1,000-3,000 IU** taken in a multi-nutrient formula, this **7,000 IU** softgel should enable these individuals to attain blood levels above **50 ng/mL**. **Item # 01718**

Vitamin D3 Liquid • 2,000 IU (Natural Mint Flavor)

1 ounce • Retail: $28 • Non-GMO
Four bottles: **$18.75** ea.
Great for travel and for those individuals who have difficulty absorbing enough vitamin D3 from softgels, this liquid vitamin D is ideal. **Item # 01732**
Also available without mint. (Item # 00864)

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

Caution: Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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

TAKE GAMMA TOCOPHEROL TO ENSURE YOU'RE GETTING

THE MOST OPTIMAL FORM OF VITAMIN E

According to the *Proceedings of the National Academy of Sciences*, alpha tocopherol (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]

Prestigious scientific journals have highlighted **gamma tocopherol** as one of the most critically important forms of **tocopherols**, which includes d-alpha tocopherol (natural 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 protect against oxidation 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]

Life Extension® fortified the popular **Gamma E Tocopherol** supplement with standardized **sesame lignans** extract long ago. Consumers thus obtain superior benefits at a much **lower cost**.

WORLD'S MOST COMPREHENSIVE VITAMIN E FORMULA!

The **Gamma E Tocopherol with Sesame Lignans** formula provides potent doses of critically important gamma **tocopherol** along with **sesame lignans** to augment its antioxidant effects. Suggested dose is one softgel once or twice daily.

Each softgel of Gamma E Tocopherol with Sesame Lignans provides:	
Vitamin E (as D-alpha tocopherol)	**45 IU**
Gamma E mixed tocopherols	**359 mg**
Sesame seed lignan extract	**20 mg**

Contains soybeans.

Gamma E Tocopherol with Sesame Lignans

Item #00759 • 60 softgels

	Retail Price	Your Price
1 bottle	$32	**$24**
4 bottles		**$21.75 each**

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

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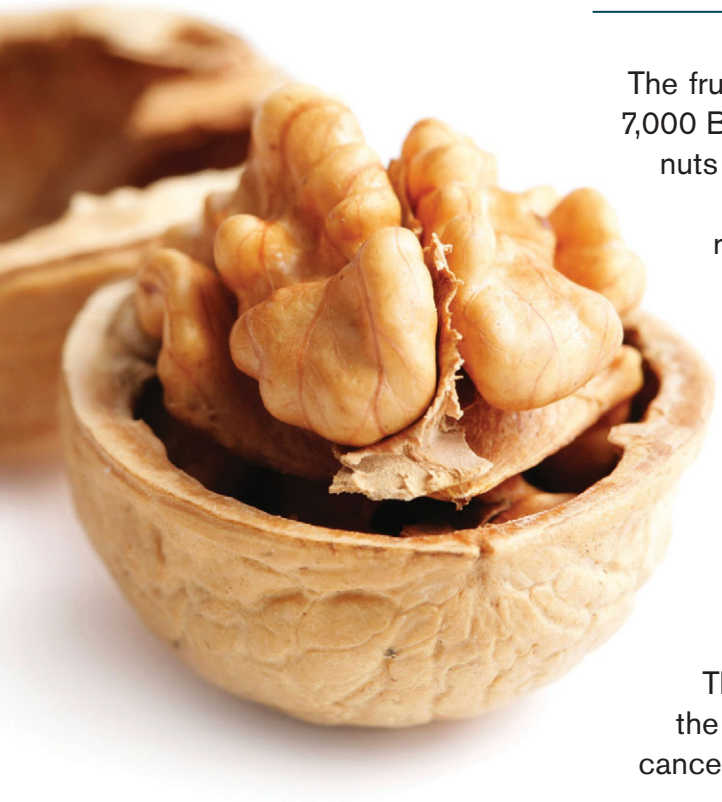
SUPER FOODS

BY MICHAEL DOWNEY

Walnuts

Abundant Disease-Prevention Benefits



The fruit of the oldest tree food known to man, dating back to 7,000 BC, **walnuts** (*Juglans regia L.*) truly stand out from other nuts for their dramatically different nutritional composition.

The healthy fats in most nuts are primarily monounsaturated fatty acids. But walnuts are rich in polyunsaturated fatty acids[1]—including omega-3 and omega-6 fatty acids—in addition to oleic acid, the powerful monounsaturate found in olive oil. In fact, the walnut is the only nut and one of the few foods that contains a significant amount of the lesser known omega-3 fat, alpha-linolenic acid (ALA)—containing the highest ALA content of all edible plants[2] with a hefty **2.7 grams** per quarter-cup serving![3]

And walnuts provide several rare and potent phytonutrients that are found in few commonly eaten foods. These unique compounds include the quinone *juglone*, the tannin *tellimagrandin*, and the flavonol *morin*[4]—all strong cancer inhibitors.

Like other nuts, walnuts contain vitamin E—but instead of having most of their vitamin E present in the alpha-tocopherol form, walnuts provide an unusually high level of the particularly beneficial **gamma-tocopherol** form.[4]

Toss in walnuts' natural array of nutrients including melatonin, copper, manganese, molybdenum, biotin, folate, selenium, and magnesium—along with the rich supply of protein and fiber also found in other nuts—and you have a true super food.

"A Remarkable Radical-Scavenging Effect"

Underlying the walnut's compelling disease-inhibiting benefits is an abundance of polyphenols, as well as the rare, anticancer phytonutrients juglone, tellimagrandin, and morin.[4] And these super-nuts are particularly rich in the phenolic compound ellagic acid, which has shown potent anti-inflammatory properties.[6]

An analysis by scientists who extracted the polyphenols from various raw and roasted nut types found that walnuts had the highest total polyphenols and the highest polyphenol efficacy.[7]

Researchers also investigated just some of walnut's tannins and ellagitannins and found that 14 different walnut polyphenols provided superoxide dismutase (SOD)-like activity and "a remarkable radical scavenging effect."[8]

Current evidence strongly suggests that polyphenols play a critical role in the prevention of atherosclerosis[7] and other cardiovascular diseases, cancers, osteoporosis, neurodegenerative diseases, and diabetes mellitus.[9] Nut supplementation has been shown to improve lipid profile, increase endothelial function, and reduce inflammation, all without causing weight gain.[7] Walnut polyphenols in particular have been shown to inhibit, for example, chemically induced liver damage.[10]

Walnuts Cut The Risk Of Cancers

Walnuts have been shown to inhibit cancer development, slow its growth, and induce the death of cancer cells.

In one study, scientists found mice that ate the human equivalent of **2.4 ounces** of whole walnuts for 18 weeks had substantially smaller and slower-growing prostate tumors compared to mice that consumed the same amount of fat but from other sources. Prostate cancer growth in the walnut group was **30** to **40%** reduced, and these mice had lower blood levels of a protein (insulin-like growth factor or IGF-1) strongly linked prostate cancer. Also, there were beneficial effects on multiple genes related to controlling tumor growth and metabolism.[11]

In a study on breast cancer in mice, the human equivalent of two handfuls of walnuts daily cut breast cancer risk in half and slowed tumor growth by **50%**.[12]

Researchers then conducted a cell study to investigate whether walnut components have an effect on colon cancer stem cells. (Cancer stem cells are a subpopulation of cancer cells that can self-renew and undergo differentiation into multiple lineages, key elements of cancer progression.) Walnut extract significantly slowed the survival of the cancer stem cells and most striking, reduced the essential characteristics of their self-renewal capacity.[13]

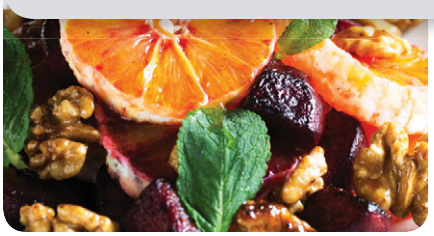
Walnuts provide potent but very rare phytonutrients that block cancer. Scientists found that incubation of human liver cancer cells with the walnut quinone juglone caused obvious, destructive changes to the structure of the cancer cells—and induced their apoptosis.[14]

Why You Should Eat The Walnut Skin

Some food experts suggest removing the paper-thin, outermost layer of a shelled walnut, citing the fact that they have a bitter taste. We're talking about the very fine, whitish outer part that is either flaky or sometimes, waxy. But you should definitely resist any advice to remove this skin from shelled walnuts. It's believed that up to **90%** of walnuts' abundant phenols are found in this skin, making it the healthiest part to eat.

Look for walnuts that are raw and unpasteurized. Note that walnuts are highly perishable due to their high content of polyunsaturated fatty acids, which are easily damaged. If you buy shelled walnuts in bulk, avoid those that appear shriveled or rubbery, smell rancid, or that you cannot verify are fresh. Shelled walnuts should be stored in an airtight container and placed in the refrigerator, where they will keep for six months, or in the freezer, where they will last for a year. Unshelled walnuts should preferably be stored in the refrigerator, although as long as you keep them in a cool, dry, dark place they will stay fresh for up to six months.

Shelled walnuts are great as a quick snack just as they are. Or add them to your favorite salad, vegetable dish, fruit, or dessert–mix crushed walnuts into plain yogurt. But if you don't like the slightly bitter flavor, you can still get their rich therapeutic benefits by blending them into smoothies.



Other rare phytonutrients in walnuts are known as tellimagrandin I and tellimagrandin II. Scientists identified these walnut members of the ellagitannins family as the predominant compounds responsible for the previously observed cytotoxic effect of walnuts on cancer cells. They also demonstrated that the mechanisms through which these walnut phytonutrients attack cancer cells include impairment of their mitochondrial function and induced apoptosis.[15]

Another rare and powerful phytonutrient found in walnuts is the flavonoid **morin**. A 2015 study published in the *International Journal of Oncology* reported that morin exerts strong anticancer activity against human colon cancer cells. It was determined to accomplish this by inducing generation of reactive oxygen species (ROS), suppressing anti-apoptotic proteins, and triggering apoptosis via several different pathways.[16]

Effective Cardiovascular Protection

Walnuts provide the amino acid L-arginine, shown to deliver vascular benefits to individuals who have heart disease or who have a higher risk for it due to multiple factors.[17]

More critically, walnuts also contain the omega-3 fat alpha-linolenic acid (ALA), which has anti-inflammatory effects and may prevent the formation of pathological blood clots. Those who eat an ALA-rich diet are less likely to have a fatal heart attack and have an almost **50%** reduced risk of sudden cardiac death.[18] It should be noted, however, that as people age, the ***enzyme*** required to convert ALA into beneficial **EPA/DHA** declines, meaning that walnuts may not provide sufficient omega-3s. That's why fish oil supplementation is so important, even in those who consume ALA-rich foods like walnuts.

And it doesn't take a lot of walnuts to make a huge difference. A study found that blood levels of ALA were significantly raised by eating just four walnuts a day![19]

Other research showed that eating just one ounce (seven walnuts) daily can decrease overall cardiovascular risk.[12] Also, increased frequency of nut consumption among people at high cardiovascular risk was found to result in a significantly lower risk of death.[20]

Walnut consumption supports healthful cholesterol levels. Scientists found that, when compared with control diets, walnut-rich diets produced significantly greater decreases in total and LDL-cholesterol concentrations, with weighted mean decreases of **10.3** and **9.2 mg/dL**, respectively.[21]

In the April 2015 issue of the *FASEB Journal*, scientists reported on an investigation into the effects of short-term walnut consumption on the reactive hyperemia index (RHI), a measure of human microvascular function—referring to the health of your body's smallest blood vessels such as capillaries. After just four weeks, the group of volunteers who ate **40 grams**, or **1.5 ounces**, of walnuts daily was found to have improved vascular function. The study concluded that this improvement was

strongly associated with the effects of the walnut fatty acids, alpha-linolenic acid (ALA) and linoleic acid (LA).[22]

Walnuts stand out because they contain an unusually high level of the gamma-tocopherol form of vitamin E instead of the alpha-tocopherol form. Gamma-tocopherol has been demonstrated—particularly in studies on the cardiovascular health of men—to provide significant protection from heart problems.[4]

Enhanced Protection Of Cognitive Function

Compounds in walnuts—gamma-tocopherol, folate, alpha-linolenic acid, omega-3 fatty acids, and antioxidant polyphenols—contribute to neuroprotection.

Animal research has indicated that consumption of foods such as blueberries and walnuts can decrease vulnerability to oxidative stress that occurs in aging and "may increase 'health span' and enhance cognitive and motor function in aging."[23]

In a study on young and old rats, scientists noted the gene transcription effects—in the critical hippocampus region of the brain—of a diet with a walnut content equivalent to **1.5 ounces** in a human diet. Compared to controls, the walnut diet increased transcription of a particular immediate-early gene (IEG) that is essential to memory formation and synaptic plasticity. This prompted researchers to conclude "that dietary walnut may have protective effects on the aging brain."[24]

Scientific attention was then shifted to humans. A crossover study published in the *British Journal of Nutrition* included 64 college students who were randomly assigned to follow an eight-week walnut diet and an eight-week placebo diet, with a six-week washout period between diet sequences. The walnut diet was demonstrated to boost inferential verbal reasoning by a significant **11.2%**.[25]

Further research has led scientists to suggest that walnuts may play a key role in the prevention of Alzheimer's disease.

First, a lab study found that walnut extract inhibited the formation of fibrillar amyloid beta-protein—a principal component of the amyloid plaques in the brains of Alzheimer's patients. Remarkably, walnut extract was also able to defibrillize already formed amyloid fibrils. The researchers concluded that "***walnuts may reduce the risk, or delay the onset, of Alzheimer's disease by maintaining (fibrillar amyloid beta-protein) in the soluble form***."[26]

Then, scientists conducted a study with transgenic mice that modeled Alzheimer's. Compared to the control diet, a diet containing the equivalent in human terms of **1.5 ounces** of walnuts daily significantly improved memory, learning ability, anxiety, and motor development. The study author suggested that "walnuts may have a beneficial effect in reducing the risk, delaying the onset, or slowing the progression of, or preventing [Alzheimer's disease]."[27]

Finally in 2015, scientists investigated the cognitive and potentially anti-Alzheimer's effects of walnut consumption on humans aged 20 through 90. Controlling for all factors except walnut consumption, the researchers found that, compared to those who ate no nuts, those who ate a handful of walnuts daily performed substantially better on all six cognitive exams, taking considerably less time to finish questions and tasks. Crucially, those over age 60 reaped special benefits from walnut consumption, achieving recall

Nutritional Content Of Walnuts

Just one ounce (**28 grams**) of shelled walnuts provides:[35]

Calories	185
Protein	4.3 grams
Total fat	18.4 grams
Cholesterol	0.0 mg
Monounsaturated fat	2,500 mg
Saturated fat	1.7 grams
Polyunsaturated fat	13.3 grams
Omega-3 fatty acids (precursor to EPA/DHA)	2,565 mg
Omega-6 fatty acids	10,761 mg
Trans fat	0.0 grams
Thiamin	0.1 mg
Vitamin B6	0.2 mg
Folate	27.7 mcg
Manganese	1.0 mg
Magnesium	44.6 mg
Phosphorus	97.8 mg
Copper	0.4 mg
Phytosterols	20.3 mg
Dietary fiber	1.9 grams

and other cognitive test scores that were more than seven percentile points higher than those of the same age group who did not eat walnuts.[28]

Other Effects

Various studies have suggested that walnuts may also provide other health benefits:

- Overweight adults with type II diabetes who ate one-quarter cup of walnuts daily reduced fasting insulin levels, compared to those who did not, within just months.[29]
- An animal study found that a diet containing the human equivalent amount of two ounces of walnuts significantly altered the ratio of two major, gut bacteria communities, suggesting "a new mechanism…by which walnuts may exert their beneficial health effects."[30]
- Consuming walnuts has, after just three days, been associated with increased satiety and, consequently, potential weight loss.[31]
- Among men consuming a Western diet, adding **75 grams**, or just over half a cup, of walnuts daily significantly improved sperm quality, including vitality, motility, and morphology.[32]

Summary

Unlike other nuts, walnuts are rich in omega-3 polyunsaturated fatty acids including alpha-linoleic acid (ALA)—a substantial **2.7 grams** per quarter cup—with an array of beneficial effects. They also contain oleic acid, the critical monounsaturate found in olive oil. Walnuts provide several very rare and highly potent, anticancer phytonutrients—juglone, tellimagrandin, and morin. Studies show walnuts can inhibit cancer[13,33,34] and promote brain,[23-25] cardiovascular,[19,20,22] microbiomic,[30] and metabolic[29] health, making them an undeniable super food. ●

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

What You Should Do

Despite the benefits you've just read about **walnuts**, it may be unwise to add them to your diet. That's because they have a relatively high calorie content that could induce unwanted weight gain.

What you should do is replace unhealthy components of your diet with walnuts.

Just imagine how much healthier the American population would be if they substituted walnuts for the dangerous snacks (such as potato chips and corn chips) that are endlessly advertised on TV?

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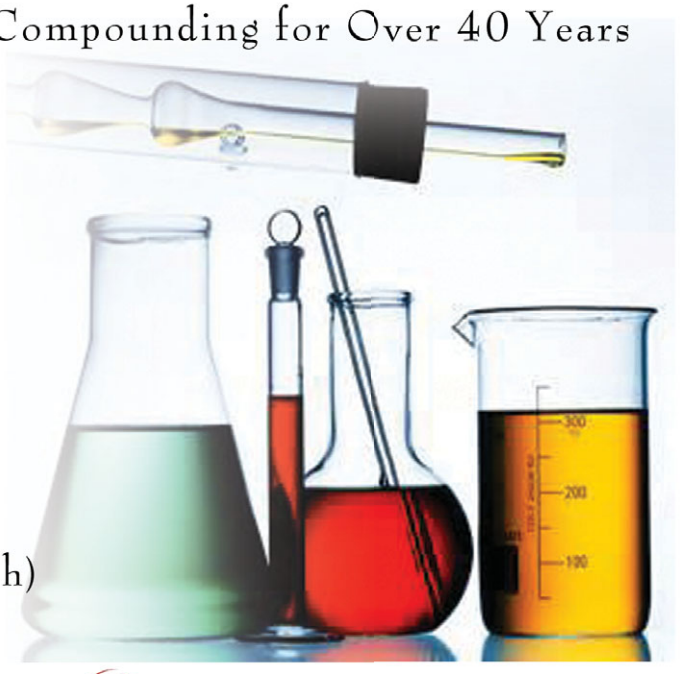

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4 bottles		**$33.75 each**

Suggested dose is one to two capsules daily.

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References
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CAUTION: If you are taking glucose lowering medication, consult your healthcare provider before taking this product.

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ULTIMATE eye HYDRATION

Maintaining eye support is essential for optimal eye health.

As we get older, our eyes become vulnerable to a variety of insults that can cause irritation and dry eye. With just a few drops of the proper eye lubricant, **eye irritation** stemming from **dryness** may be alleviated.

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Brite Eyes III
Item #00893 • 2 vials (5 mL each)

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Blood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that blood testing is an essential component of any program designed to attain optimal health and longevity, *Life Extension*® offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

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2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit; whichever is applicable (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370; or review the results with your personal physician.

It's that simple! Don't delay—call today!

For Our Local Customers:

For those residing in the Ft. Lauderdale, Florida area, blood-draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address is 5990 North Federal Highway, Ft. Lauderdale, FL, 33308-2633.

Blood Testing
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MOST POPULAR PANELS

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COMPREHENSIVE PANELS

MALE LIFE EXTENSION PANEL (LC322582) — $269

Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. **CBC** includes immune (white) cell count, red blood cell count and platelet count. Also includes:

DHEA-S
TSH for thyroid function
Estradiol
Vitamin D 25- hydroxy
Hemoglobin A1c
C-Reactive Protein
Homocysteine
Free Testosterone
Total Testosterone
PSA (prostate-specific antigen)

FEMALE LIFE EXTENSION PANEL (LC322535) — $269

Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. **CBC** includes immune (white) cell count, red blood cell count and platelet count. Also includes:

DHEA-S
TSH for thyroid function
Estradiol
Progesterone
Hemoglobin A1c
C-Reactive Protein
Homocysteine
Free Testosterone
Total Testosterone
Vitamin D 25-hydroxy

WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) — $275

CBC/Chemistry profile (see description at right), DHEA-S, free and total Testosterone, Estradiol, Progesterone, Cortisol, TSH, Free T3, Free T4, Reverse T3, Insulin, Hemoglobin A1c, Vitamin D 25-hydroxy, C-Reactive Protein (high sensitivity), and Ferritin.

MALE ELITE PANEL* (LC100016) — $575

Chem/CBC profile, Free and Total Testosterone, Total Estrogens, Estradiol, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, Free and Total PSA, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, Ferritin, Homocysteine

FEMALE ELITE PANEL* (LC100017) — $575

Chem/CBC profile, Free and Total Testosterone, Total Estrogens, Estradiol, Estrone, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, Ferritin, Homocysteine

MALE HORMONE ADD-ON PANEL (LCADDM)* — $120

Pregnenolone and Dihydrotestosterone (DHT)

To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides valuable information about a testosterone metabolite that can affect the prostate, and the mother hormone that acts as a precursor to all other hormones.

FEMALE HORMONE ADD-ON PANEL (LCADDF)* — $125

Pregnenolone and Total Estrogens

To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides valuable information about total estrogen status, and the mother hormone that acts as a precursor to all other hormones.

LIFE EXTENSION THYROID PANEL (LC304131) — $75

TSH, T4, Free T3, Free T4.

FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011) — $299

CBC/Chemistry Profile (see description above right), DHEA-S, Estradiol, Total Estrogens, Progesterone, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol.

MALE COMPREHENSIVE HORMONE PANEL* (LC100010) — $299

CBC/Chemistry Profile (see description above right), DHEA-S, Estradiol, DHT, PSA, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol.

THE CBC/CHEMISTRY PROFILE (LC381822) — $35

Note: This CBC/Chemistry Profile is included in many Life Extension panels. Please check panel descriptions.

CARDIOVASCULAR RISK PROFILE
Total Cholesterol
HDL Cholesterol
LDL Cholesterol
Triglycerides
Cholesterol/HDL Ratio
Estimated CHD Risk
Glucose
Iron

LIVER FUNCTION PANEL
AST (SGOT)
ALT (SGPT)
LDH
Total Bilirubin
Alkaline Phosphatase

KIDNEY FUNCTION PANEL
BUN
Creatinine
BUN/Creatinine Ratio
Uric Acid

BLOOD PROTEIN LEVELS
Total Protein
Albumin
Globulin
Albumin/Globulin Ratio

BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE
Red Blood Cell Count
White Blood Cell Count
Eosinophils
Basophils
Polys (Absolute)
Lymphs (Absolute)
Monocytes (Absolute)
Eos (Absolute)
Baso (Absolute)
RDW
Monocytes
Lymphocytes
Platelet Count
Hemoglobin
Hematocrit
MCV
MCH
MCHC
Polynucleated Cells

BLOOD MINERAL PANEL
Calcium
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Phosphorus
Sodium
Chloride
Iron

COMPREHENSIVE THYROID PANEL (LC100018) — $199

TSH, T4, Free T4, Free T3, Reverse T3, TPO, ATA

FOOD SAFE ALLERGY TEST (LCM73001)** — $198

This test measures delayed (IgG) food allergies for 95 common foods.

STRESS MANAGEMENT PROFILE (LC100043) — $125

Cortisol AM/PM, DHEA-S, Glucose, Insulin, Progesterone, Free T3, Lipid Panel

HEALTHY AGING PANEL-COMPREHENSIVE* (LC100026) — $249

CBC/Chemistry profile (see description above), C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Homocysteine, Vitamin D 25-hydroxy, Hemoglobin A1c, TSH, Free T3, Free T4, Ferritin, Urinalysis, Fibrinogen, and Insulin.

HEALTHY AGING PANEL-BASIC* (LC100025) — $149

CBC/Chemistry profile (see description above), C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Vitamin D 25-hydroxy, Hemoglobin A1c, TSH, Ferritin, and Insulin.

VAP™ TEST* (LC804500) — $90

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.

VAP™ PLUS* (LC100009) — $330

VAP, C-Reactive Protein (high sensitivity), Homocysteine, Fibrinogen, PLAC® Test (Lp-PLA2), Vitamin D 25-hydroxy.

Other Popular Tests and Panels

◯ **NUTRIENT PANEL*** **(LC100024)** — **$349**
Vitamin B12, Folate, Vitamin D 25-hydroxy, Vitamin C, Vitamin A, Selenium, Zinc, CoQ10, and RBC Magnesium.

◯ **CHRONIC FATIGUE PROFILE** **(LC100005)** — **$375**
CBC/Chemistry Profile (see description previous page), Epstein –Barr Virus antibodies (IgG and IgM), Cytomegalovirus Antibodies (IgG and IgM), Ferritin, Total and Free Testosterone, DHEA-S, Free T3, Free T4, Cortisol, C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Insulin.

◯ **ANEMIA PANEL*** **(LC100006)** — **$79**
CBC/Chemistry Profile (see description previous page), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate

◯ **AUTOIMMUNE DISEASE SCREEN*** **(L100041)** — **$199**
ANA screen, hs-CRP, TNF , Immunoglobulins, IgA, IgG, IgM

◯ **DIABETES MANAGEMENT PROFILE – COMPREHENSIVE** **(LC100040)** — **$129**
Hemoglobin A1C, Glucose, Insulin, Lipid Panel, Glycomark

◯ **DIABETES MANAGEMENT PROFILE – BASIC** **(LC100039)** — **$39**
Hemoglobin A1C, Glucose, Insulin

ADVANCED CARDIAC BIOMARKERS

◯ **ADVANCED OXIDIZED LDL PANEL*** **(LC100035)** — **$285**
This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic as well as cardiovascular disease and the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase, and Oxidized LDL.

◯ **OXIDIZED LDL PANEL*** **(LC100034)** — **$175**
This panel looks at vascular inflammatory biomarkers, beginning with the development of metabolic as well as cardiovascular disease and the formation of vulnerable plaque. The panel contains the following tests: Myeloperoxidase and Oxidized LDL.

◯ **OXIDIZED LDL*** **(LC817472)** — **$75**
OxLDL is a powerful initiator of inflammatory changes in the artery wall, which eventually lead to the formation of plaque.

HORMONES

◯ **DHEA-SULFATE** **(LC004020)** — **$61**
This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.

◯ **MALE BASIC HORMONE PANEL** **(LC100012)** — **$75**
DHEA-S, Estradiol, Free and Total Testosterone, PSA

◯ **FEMALE BASIC HORMONE PANEL** **(LC100013)** — **$75**
DHEA-S, Estradiol, Free and Total Testosterone, Progesterone

◯ **DIHYDROTESTOSTERONE (DHT)*** **(LC500142)** — **$50**
Measures serum concentrations of DHT.

◯ **ESTRADIOL** **(LC004515)** — **$33**
For men and women. Determines the proper amount in the body.

◯ **INSULIN FASTING** **(LC004333)** — **$29.90**
Can predict those at risk of diabetes, obesity, heart and other diseases.

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

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

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

GENERAL HEALTH

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

◯ **FERRITIN** **(LC004598)** — **$28**
Ferritin levels reflect your body's iron stores and is also a biomarker for insulin resistance.

◯ **VITAMIN B12/FOLATE*** **(LC000810)** — **$39.68**
Measurements of B12 and Folate help evaluate your general health and nutritional status since the B vitamins are important for cardiac health as well as energy production.

◯ **PSA (PROSTATE SPECIFIC ANTIGEN)** **(LC010322)** — **$31**
Screening test for prostate disorders and possible cancer.

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Resveratrol with Pterostilbene
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Solarshield® Sunglasses
X-R Shield

Mood & Stress Management

5 HTP
L-Theanine
Natural Stress Relief
SAMe (S-Adenosyl-Methionine)

Multivitamins

Children's Formula Life Extension Mix™
Comprehensive Nutrient Packs ADVANCED
Life Extension Mix™ Capsules without Copper
Life Extension Mix™ Capsules
Life Extension Mix™ Powder without Copper
Life Extension Mix™ Powder
Life Extension Mix™ Tablets with Extra Niacin
Life Extension Mix™ Tablets without Copper
Life Extension Mix™ Tablets
Once-Daily Health Booster
One-Per-Day Tablets
Two-Per-Day Capsules
Two-Per-Day Tablets

Personal Care

Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
European Leg Solution Featuring Certified Diosmin 95
Face Master Platinum Facial Toning System
Hair, Skin & Nail Rejuvenation Formula w/VERISOL®
Hair Suppress Formula
Life Extension Toothpaste
Sinus Cleanser
Venotone
Xyliwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Probiotics

Bifido GI Balance
BroccoMax®
FlorAssist® Heart Health Probiotic
FlorAssist® Oral Hygiene
FlorAssist® Probiotic
FlorAssist® Throat Health
Jarro-Dophilus EPS®
Theralac® Probiotics
TruFlora® Probiotics

Skin Care

Advanced Anti-Glycation Peptide Serum
Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Triple Peptide Serum
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Face Oil
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Glycation Serum with Blueberry & Pomegranate Extracts
Antioxidant Facial Mist
Anti-Oxidant Rejuvenating Foot Cream
Anti-Oxidant Rejuvenating Foot Scrub
Anti-Oxidant Rejuvenating Hand Cream
Anti-Redness & Adult Blemish Lotion
Bioflavonoid Cream
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
Corrective Clearing Mask
DNA Repair Cream
Dual-Action MicroDermAbrasion
Enhanced FernBlock® with Red Orange Complex
Essential Plant Lipids Reparative Serum
Face Rejuvenating Anti-Oxidant Cream
Fine Line-Less
Healing Formula
Healing Mask
Healing Vitamin K Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydroderm
Lifting & Tightening Complex
Lycopene Cream
Melatonin Cream
Mild Facial Cleanser
Multi Stem Cell Skin Tightening Complex
Neck Rejuvenating Anti-Oxidant Cream
Pigment Correcting Cream
Rejuvenating Serum
Rejuvenex® Body Lotion
RejuveneX® Factor Firming Serum
Renewing Eye Cream
Resveratrol Anti-Oxidant Serum
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Ultra Lip Plumper
Ultra Rejuvenex®
Ultra RejuveNight®
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Youth Serum

Sleep

Bioactive Milk Peptides
Enhanced Natural Sleep® with Melatonin
Enhanced Natural Sleep® without Melatonin
Fast-Acting Liquid Melatonin
Glycine
L-Tryptophan
Melatonin
Optimized Tryptophan Plus

Sports Performance

Creatine Capsules
Creatine Whey Glutamine Powder (Vanilla Flavor)
DMG (N, N-dimethylglycine)
New Zealand Whey Protein Concentrate, (Natural Chocolate and Vanilla Flavor)
Pure Plant Protein
Tart Cherry Extract
Whey Protein Isolate (Chocolate and Vanilla Flavor)

Vitamins

Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
Biotin
Buffered Vitamin C Powder
Complete B-Complex
Daily C+
Fast-C® with Dihydroquercetin
Gamma E Tocopherol with Sesame Lignans
Gamma E Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK-7
Natural Vitamin E
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5'-Phosphate Caps
Super Absorbable Tocotrienols
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K with Advanced K2 Complex
Vitamin B12
Vitamin B6
Vitamin C with Dihydroquercetin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

Weight Management

7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCActive™ Garnicia Cambogia Extract
Integra-Lean®
Mediterranean Trim with Sinetrol™-XPur
Optimized Irvingia with Phase 3™ Calorie Control Complex
Optimized Saffron with Satiereal®
Super Citrimax®
Super CLA Blend with Guarana and Sesame Lignans
Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women's Health

Advanced Natural Sex for Women® 50+
Breast Health Formula
Femmenessence MacaPause®
Natural Estrogen without Soy Isoflavones
Natural Estrogen
ProgestaCare® for Women
Super-Absorbable Soy Isoflavones
Ultra Soy Extract

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	A						
01524	**ACETYL-L-CARNITINE** • 500 mg, 100 veg. caps	34.00	25.50	22.50			
01525	**ACETYL-L-CARNITINE ARGINATE** • 100 veg. caps	59.00	44.25	38.24			
01628	**ADRENAL ENERGY FORMULA** • 60 veg. caps	24.00	18.00	16.50			
01630	**ADRENAL ENERGY FORMULA** • 120 veg. caps	46.00	34.50	31.50			
01828	**ADVANCED LIPID CONTROL** • 60 veg. caps	30.00	22.50	20.25			
00681	**AHCC®** • 500 mg, 30 caps	59.98	44.99				
29727	**AHCC® (KINOKO® GOLD)** • 500 mg, 60 veg. caps	74.95	52.47				
00457	**ALPHA-LIPOIC ACID W/BIOTIN** (Super) • 250 mg, 60 caps	37.00	27.75	24.00			
01907	**AMPK ACTIVATOR** • 90 veg. caps	48.00	36.00	33.00			
01440	**ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO** • 100 caps	26.00	19.50	17.25			
01509	**ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN®** (Advanced) • 60 veg. caps	39.00	29.25	27.00			
01625	**APPLEWISE POLYPHENOL EXTRACT** 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	**ARGININE/ORNITHINE** • 500/250, 100 caps	17.99	13.49				
00038	**ARGININE/ORNITHINE POWDER** • 150 grams	22.95	17.21	14.25			
01624	**(L)-ARGININE CAPS** • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	**ARTERIAL PROTECT** • 30 veg. caps	48.00	36.00	33.00			
01617	**ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX®** 120 veg. caps	44.00	33.00	30.00			
01618	**ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX®** 60 caps	36.00	27.00	24.00			
01404	**ARTHRO-IMMUNE JOINT SUPPORT** • 60 veg. caps	32.00	24.00	21.00			
00919	**ARTICHOKE LEAF EXTRACT** • 500 mg, 180 veg. caps	30.00	22.50	21.00			
01533	**ASCORBYL PALMITATE** • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	**ASHWAGANDHA EXTRACT** (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	**ASIAN ENERGY BOOST** • 90 veg. caps	24.00	18.00	16.50			
01066	**ASPIRIN** • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01720	**ASTAXANTHIN WITH PHOSPHOLIPIDS** • 4 mg, 30 softgels	16.00	12.00	10.50			
	B						
00920	**BENFOTIAMINE W/ THIAMINE** • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	**BENFOTIAMINE** (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
01206	**BERRY COMPLETE** • 30 veg. caps	21.00	15.75	14.00			
01496	**BERRY COMPLETE W/ACAI** (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	**BETA-CAROTENE** • 25,000 IU, 100 softgels	11.25	8.44				
01622	**BIFIDO GI BALANCE** • 60 veg. caps	20.00	15.00	13.50			
01073	**BILBERRY EXTRACT** • 100 mg, 100 veg. caps	42.00	31.50	28.50			
01512	**BIOACTIVE MILK PEPTIDES** • 30 caps	18.00	13.50	12.00			
01631	**BIO-COLLAGEN W/PATENTED UC-II®** • 40 mg, 60 small caps	36.00	27.00	24.00			
*01006	**BIOSIL™** • 5 mg, 30 veg. caps	18.95	15.16				
*01007	**BIOSIL™** • 1 fl oz	31.99	25.59				
00102	**BIOTIN** • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	**BLACK CUMIN SEED OIL** • 60 softgels	16.00	12.00	10.50			
01710	**BLACK CUMIN SEED OIL W/BIO-CURCUMIN®** • 60 softgels	32.00	24.00	22.50			
01008	**BLAST™** • 600 grams of powder	26.95	20.21				
70000	**BLOOD PRESSURE MONITOR (ACCUFIT™)** • med/lg cuff	79.99	49.99				
70004	**BLOOD PRESSURE MONITOR** • Digital wrist cuff	69.95	52.46				

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01214	**BLUEBERRY EXTRACT** • 60 veg. caps	22.50	16.88	15.00			
01438	**BLUEBERRY EXTRACT W/ POMEGRANATE** • 60 veg. caps	30.00	22.50	20.25			
01506	**BONE FORMULA** (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	**BONE RESTORE** • 120 caps	22.00	16.50	14.25			
01727	**BONE RESTORE W/VITAMIN K2** • 120 caps	24.00	18.00	16.50			
01725	**BONE STRENGTH FORMULA W/KOACT®** • 120 caps	45.00	33.75	30.00			
00313	**BONE-UP®** • 240 caps	28.95	21.71	20.41			
01661	**BORON** • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	**BOSWELLA** • 100 caps	38.00	28.50	22.50			
01802	**BRAIN SHIELD® GASTRODIN** • 300 mg, 60 veg. caps	33.00	24.75	22.50			
01253	**BRANCHED CHAIN AMINO ACIDS** • 90 caps	19.50	14.63	12.75			
01699	**BREAST HEALTH FORMULA** • 60 caps	34.00	25.50	22.50			
00893	**BRITE EYES III** • 2 vials, 5 ml each	34.00	25.50	24.00			
26576	**BROCCO MAX®** • 60 veg. caps	26.95	20.21				
01203	**BROMELAIN** (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
	C						
01653	**CALCIUM CITRATE W/VITAMIN D** • 300 caps	24.00	18.00	15.94			
01651	**CALCIUM D-GLUCARATE** • 200 mg, 60 veg. caps	18.00	13.50	11.25			
†01823	**CALREDUCE SELECTIVE FAT BINDER** 120 mint chewable tablets	45.00	33.75	28.50			
01700	**CARDIO PEAK™ w/STANDARDIZED HAWTHORN & ARJUNA** 120 veg. caps	36.00	27.00	24.00			
00916	**CARNITINE W/GLYCOCARN®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01532	**L-CARNITINE** • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01258	**CARNOSOOTHE W/PICROPROTECT™** • 60 veg. caps	29.95	22.46	20.25			
01829	**CARNOSINE** • 500 mg, 60 veg. caps	36.00	27.00	24.00			
01687	**CARNOSINE** (Super) • 500 mg, 90 veg. caps	66.00	49.50	45.00			
01830	**CAT MIX** • 100 grams powder	14.00	10.50	8.25			
01891	**CHILDREN'S FORMULA LIFE EXTENSION MIX™** 100 chewable tablets	20.00	15.00	13.50			
00550	**CHLORELLA** • 500 mg, 200 tablets	23.50	17.63				
01571	**CHLOROPHYLLIN** • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	**CHO-LESS™** • 90 capsules	35.00	26.25				
01910	**CHOL-SUPPORT™** • 60 liquid veg. caps	52.00	39.00	34.50			
01477	**CHROMIUM ULTRA** • 100 veg. caps	24.00	18.00	15.75			
01504	**CHROMIUM W/CROMINEX®** 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	**CINSULIN® W/INSEA2® AND CROMINEX® 3+**- 90 veg. caps	38.00	28.50	25.50			
01906	**CISTANCHE** (Standardized) • 30 veg. caps	20.00	15.00	12.00			
01818	**CITRIMAX®** (Super)- 180 veg. caps	40.00	30.00	28.50			
00818	**CLA BLEND W/SESAME LIGNANS** (Super) 1,000 mg, 120 softgels	36.00	27.00	24.75	19.75		
00819	**CLA BLEND W/GUARANA & SESAME** (Super) 1,000 mg, 120 softgels	42.00	31.50	28.75			
01896	**COGNITEX® W/BRAIN SHIELD®** • 90 softgels	60.00	45.00	39.00	36.00		
01897	**COGNITEX® W/PREGNENOLONE & BRAIN SHIELD®** 90 softgels	62.00	46.50	39.75	37.50		
01421	**COGNITEX® BASICS** • 60 softgels	38.00	28.50	26.25	24.00		
01659	**COGNIZIN® CDP CHOLINE CAPS** • 250 mg, 60 veg. caps	36.00	27.00	25.50			

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01835	**COMPLETE B-COMPLEX** • 60 veg. caps	10.00	7.50	6.75			
01999	**COMPREHENSIVE NUTRIENT PACKS ADVANCED** • 30 packs	90.00	67.50	61.50			
00119	**COPPER CAPSULES** • 2 mg, 100 caps	9.91	7.43				
00949	**COQ10 w/*d*-LIMONENE** (Super-absorbable) 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
00950	**COQ10 w/*d*-LIMONENE** (Super-absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
01226	**COQ10** (Super ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	**COQ10 w/BIOPQQ®** (Super ubiquinol) • 100 mg, 30 softgels	54.00	40.50	33.00	30.00		
01426	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) - 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) - 50 mg, 30 softgels	20.00	15.00	12.00			
01431	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) - 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	**CRAN-MAX®** • 500 mg, 60 veg. caps	17.50	13.13	11.25			
01424	**CRAN-MAX® WITH ELLIROSE™** (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	**CREATINE CAPSULES** • 120 veg. caps	10.95	8.21	6.94			
01746	**CREATINE WHEY GLUTAMINE POWDER** • 454 grams (vanilla)	30.00	22.50	20.25			
01429	**CR MIMETIC LONGEVITY FORMULA** • 60 veg. caps	39.00	29.25	27.00			
00407	**CURCUMIN®** (Super bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01808	**CURCUMIN® W/GINGER & TURMERONES** (Advanced bio) 30 softgels	30.00	22.50	20.25			
01804	**CYTOKINE SUPPRESS™ W/EGCG** • 30 veg. caps	30.00	22.50	20.25			
	COSMESIS						
80157	**ADVANCED ANTI-GLYCATION PEPTIDE SERUM** • 1 oz	53.00	39.75	34.50			
80154	**ADVANCED LIGHTENING CREAM** • 1 oz	65.00	48.75	42.75			
80155	**ADVANCED PEPTIDE HAND THERAPY** • 4 oz	46.00	34.50	29.25			
80152	**ADVANCED TRIPLE PEPTIDE SERUM** • 1 oz	65.00	48.75	42.75			
80140	**ADVANCED UNDER EYE SERUM W/STEM CELLS** • .33 oz	49.00	36.75	31.50			
80139	**AMBER SELF MICRODERMABRASION** • 2 oz	49.00	36.75	31.50			
80158	**ANTI-AGING FACE OIL** • 1 oz	59.00	44.25	39.00			
80118	**ANTI-AGING MASK** • 2 oz	72.00	54.00	47.52			
80151	**ANTI-AGING REJUVENATING FACE CREAM** • 2 oz	65.00	48.75	42.75			
80153	**ANTI-AGING REJUVENATING SCALP SERUM** • 2 oz	46.00	34.50	29.25			
80134	**ANTI-GLYCATION SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS** • 1 oz	33.00	24.75	23.51			
80133	**ANTIOXIDANT FACIAL MIST** • 2 oz	32.00	24.00	22.80			
80127	**ANTIOXIDANT REJUVENATING FOOT CREAM** • 2 oz	45.00	33.75	32.10			
80128	**ANTIOXIDANT REJUVENATING FOOT SCRUB** • 2 oz	59.00	44.25	38.94			
80117	**ANTIOXIDANT REJUVENATING HAND CREAM** • 2 oz	64.00	48.00	43.12			
80105	**ANTI-REDNESS & ADULT BLEMISH LOTION** • 1 oz	74.50	55.88	49.17			
80147	**BIOFLAVONOID CREAM** • 1 oz	46.00	34.50	29.25			
80144	**BROCCOLI SPROUT CREAM** • 1 oz	46.00	34.50	29.25			
80156	**COLLAGEN BOOSTING PEPTIDE SERUM** • 1 oz	59.00	44.25	39.00			
80120	**CORRECTIVE CLEARING MASK** • 2 oz	64.50	48.38	42.57			
80141	**DNA REPAIR CREAM** • 1 oz	49.00	36.75	31.50			
80108	**ESSENTIAL PLANT LIPIDS REPARATIVE SERUM** • 1 oz	74.95	56.21	49.46			
	SUBTOTAL OF COLUMN 3						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
80123	**FACE REJUVENATING ANTIOXIDANT CREAM** • 2 oz	69.50	52.13	45.87			
80107	**FINE LINE-LESS** • 1 oz	74.50	55.88	49.17			
80131	**HAIR SUPPRESS FORMULA** • 4 oz	59.00	44.25	38.94			
80137	**HEALING FORMULA ALL-IN-ONE CREAM** • 1 oz	53.00	39.75	34.07			
80115	**HEALING MASK** • 2 oz	64.50	48.38	42.57			
80102	**HEALING VITAMIN K CREAM** • 1 oz	79.50	59.63	52.47			
80109	**HYALURONIC FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80110	**HYALURONIC OIL-FREE FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80138	**HYDRATING ANTIOXIDANT FACE MIST** • 4 oz	39.95	29.96	28.50			
80103	**LIFTING & TIGHTENING COMPLEX** • 1 oz	74.50	55.88	49.17			
80146	**LYCOPENE CREAM** • 1 oz	28.00	21.00	19.05			
80135	**MELATONIN CREAM** • 1 oz	33.00	24.75	20.33			
80114	**MILD FACIAL CLEANSER** • 8 oz	59.00	44.25	38.94			
80159	**MULTI STEM CELL SKIN TIGHTENING COMPLEX** • 1 oz	59.00	44.25	39.00			
80122	**NECK REJUVENATING ANTIOXIDANT CREAM** • 2 oz	64.00	48.00	42.24			
80111	**PIGMENT CORRECTING CREAM** • 1/2 oz	74.00	55.50	48.84			
80106	**REJUVENATING SERUM** • 1 oz	74.50	55.88	49.17			
80150	**RENEWING EYE CREAM** • 1/2 oz	65.00	48.75	42.75			
80142	**RESVERATROL ANTI-OXIDANT SERUM** • 1 oz	46.00	34.50	29.25			
80112	**SKIN LIGHTENING SERUM** • 1/2 oz	85.00	63.75	56.10			
80130	**SKIN STEM CELL SERUM** • 1 oz	74.00	55.50	51.75			
80143	**STEM CELL CREAM W/ALPINE ROSE** • 1 oz	66.00	49.50	43.50			
80148	**TIGHTENING & FIRMING NECK CREAM** • 2 oz	39.00	29.25	26.25			
80116	**ULTRA LIP PLUMPER** • 1/3 oz	64.00	48.00	42.24			
80101	**ULTRA WRINKLE RELAXER** • 1 oz	89.95	67.46	59.82			
80113	**UNDER EYE REFINING SERUM** • 1/2 oz	74.50	55.88	49.17			
80104	**UNDER EYE RESCUE CREAM** • 1/2 oz	74.50	55.88	49.17			
80129	**VITAMIN C SERUM** • 1 oz	85.00	63.75	56.10			
80136	**VITAMIN D LOTION** • 4 oz	36.00	27.00	25.25			
80145	**VITAMIN E-ESSENTIAL CREAM** • 1 oz	28.00	21.00	19.50			
80149	**YOUTH SERUM** • 1 oz	65.00	48.75	42.75			
	D						
01912	**DAILY C+ CITRUS FLAVOR** • 30 stick packs	21.00	15.75	14.25			
00658	**7-KETO® DHEA METABOLITE** • 25 mg, 100 caps	28.00	21.00	18.00			
01479	**7-KETO® DHEA METABOLITE** • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	**DHA** (Vegetarian sourced) • 30 veg. softgels	20.00	15.00	13.50			
00607	**DHEA** • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
01478	**DHEA COMPLETE** • 60 veg. caps	48.00	36.00	32.40			
00335	**DHEA** • 25 mg, 100 caps	18.00	13.50	11.25			
00454	**DHEA** • 15 mg, 100 caps	14.00	10.50	9.00			
00882	**DHEA** • 50 mg, 60 caps	19.00	14.25	12.75			
01689	**DHEA** • 100 mg, 60 veg. caps	24.00	18.00	16.50			
01358	**DIGEST RC®** • 30 tablets	19.95	14.96	12.75			
02021	**DIGESTIVE ENZYMES** (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	**DIGESTIVE ENZYMES w/PROBIOTICS** (Enhanced Super) • 60 veg. caps	28.00	21.00	18.00			
01671	**D,L-PHENYLALANINE** • 500 mg, 100 veg. caps	18.75	14.06	12.00			
	SUBTOTAL OF COLUMN 4						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01540	**DMAE BITARTRATE** • 150 mg, 200 veg. caps	18.00	13.50	11.25			
00059	**DMG** • 125 mg, 60 tablets	24.80	18.60	17.02			
01570	**DNA PROTECTION FORMULA** • 60 veg. caps	34.00	25.50	24.00			
01831	**DOG MIX** • 100 grams powder	18.00	13.50	11.25			
02006	**DOPA-MIND™** • 60 veg. tabs	48.00	36.00	32.00			
00321	**DR. PROCTOR'S ADVANCED HAIR FORMULA** • 2 oz	39.95	29.96	24.00			
00320	**DR. PROCTOR'S HAIR SHAMPOO** • 8 oz	24.95	18.71	16.50			
00899	**DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE** • 2.4 oz	39.95	29.96	29.21			
	E						
01528	**ECHINACEA EXTRACT** • 250 mg, 60 veg. caps	14.35	10.76	9.38			
01997	**ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ AND CORDIART™** • 60 softgels	68.00	51.00	46.50			
00997	**ENDOTHELIAL DEFENSE™ w/GLISODIN®** • 60 veg. caps	54.00	40.50	36.00			
00625	**EPA/DHA** (Mega) • 120 softgels	19.95	14.96	13.50			
01737	**ESOPHAGEAL GUARDIAN** (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01042	**EUROPEAN LEG SOLUTION DIOSMIN 95** 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	**EXTRAORDINARY ENZYMES** • 60 caps	26.00	19.50	18.00			
01514	**EYE PRESSURE SUPPORT W/MIRTOGENOL®** • 30 veg. caps	38.00	28.50	25.50			
	F						
*01054	**FACE MASTER® PLATINUM** • Facial Toning System	199.00	199.00				
00965	**FAST-ACTING JOINT FORMULA** • 30 caps	39.00	29.25	27.00			
01717	**FAST-C® W/DIHYDROQUERCETIN** • 120 veg. tabs	26.00	19.50	18.00			
20053	**FEM DOPHILUS®** • 30 caps	25.95	19.46				
20055	**FEM DOPHILUS®** • 60 caps	39.95	29.96				
01064	**FEMMENESSENCE MACAPAUSE®** • 120 veg. caps	34.99	26.24				
01728	**FERNBLOCK® W/RED ORANGE COMPLEX** (Enhanced) 30 veg. caps	42.00	31.50	28.50			
00718	**FIBRINOGEN RESIST™** • 30 veg. caps	49.00	36.75	33.00			
01749	**FLAX SEED** (Organic golden) • 14 oz	11.67	8.75				
01821	**FLORASSIST® HEART HEALTH PROBIOTIC** • 60 veg. caps	32.00	24.00	21.00			
02011	**FLORASSIST® ORAL HYGIENE** • 30 lozenges	20.00	15.00	13.50			
01825	**FLORASSIST® PROBIOTIC** • 30 liquid veg. caps	32.00	24.00	21.00			
01920	**FLORASSIST® THROAT HEALTH** • 30 lozenges	20.00	15.00	13.50			
01913	**FOLATE** (Optimized) • 5,000 mcg, 30 veg. tablets	25.00	18.75	16.50			
01939	**FOLATE** (Optimized) • 1,000 mcg, 100 veg. tablets	19.00	14.25	12.75			
01841	**FOLATE + VITAMIN B12 CAPS** • 200 veg. caps	10.50	7.88	7.13			
01544	**FORSKOLIN** • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	**FUCOIDAN W/MARITECH® 926** (Optimized) • 60 veg. caps	36.00	27.00	24.75			
	G						
00559	**GAMMA E TOCOPHEROL/TOCOTRIENOLS** • 60 softgels	42.00	31.50	27.75			
00759	**GAMMA E TOCOPHEROL W/SESAME LIGNANS** • 60 softgels	32.00	24.00	21.75			
01394	**GARLIC** (Optimized) • 200 veg. caps	24.95	18.71	15.75			
**01122	**GINGER FORCE®** • 60 liquid caps	34.95	26.21				
01658	**GINKGO BILOBA CERTIFIED EXTRACT™** 120 mg, 365 veg. caps	46.00	34.50	31.50			
01648	**GINKGO EXTRACT 28/7** (Super) • 120 mg, 100 veg. caps	29.00	21.75	19.88			
00756	**GLA WITH SESAME LIGNANS** (Mega) • 60 softgels	19.50	14.63	13.50			

SUBTOTAL OF COLUMN 5

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
00345	**(L-) GLUTAMINE CAPSULES** • 500 mg, 100 caps	14.95	11.21	10.13			
00141	**(L-) GLUTAMINE POWDER** • 100 grams	22.00	16.50	15.00			
00522	**GLUCOSAMINE/CHONDROITIN CAPSULES** • 100 caps	38.00	28.50	24.00			
01541	**GLUTATHIONE, CYSTEINE & C** • 100 veg. caps	20.00	15.00	13.50			
00314	**L-GLUTATHIONE** (Mega) • 250 mg, 60 caps	39.64	29.73				
01987	**GLYCATION PROTECTION FORMULA** • 60 veg. caps	44.00	33.00	29.25			
01669	**GLYCINE** • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
01411	**GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE** 100 mg, 60 veg. caps	36.00	27.00	25.50			
01604	**GREEN COFFEE EXTRACT COFFEEGENIC®** 200 mg, 90 veg. caps	22.00	16.50	15.00			
01620	**GREEN COFFEE EXTRACT COFFEEGENIC®** 400 mg, 90 veg. caps	32.00	24.00	21.00			
00953	**GREEN TEA EXTRACT** (Mega) • lightly caffeinated,100 veg. caps	30.00	22.50	18.00			
00954	**GREEN TEA EXTRACT** (Mega) • decaffeinated, 100 veg. caps	30.00	22.50	18.00			
	H						
01074	**5 HTP** • 100 mg, 60 caps	27.95	20.96				
**02002	**HAIR, SKIN & NAIL REJUVENATION FORM W/VERISON®** 90 tabs	32.00	24.00	22.00			
01738	**HCA** (Garnicia) • 90 veg. caps	17.00	12.75	11.25			
29754	**HCACTIVE™ GARCINIA CAMBOGIA EXTRACT** • 90 caps	30.00	22.50				
01393	**HEPATOPRO** • 900 mg, 60 softgels	50.00	37.50	34.50			
01527	**HUPERZINE A** • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	**HYDRODERM®** • 1 oz	79.95	59.96	49.00			
	I						
*01060	**I26 HYPERIMMUNE EGG** • 140 grams powder	54.99	46.75				
01704	**IMMUNE MODULATOR W/TINOFEND®** • 60 veg. caps	17.00	12.75	11.25			
00955	**IMMUNE PROTECT W/PARACTIN®** • 30 veg. caps	29.50	22.13	19.91			
02005	**IMMUNE SENESCENCE PROTECTION FORMULA™** • 60 veg. tabs	40.00	30.00	27.00			
01049	**INNERPOWER™** • 530 grams powder	42.00	31.50				
01674	**INOSITOL CAPSULES** • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	**INTEGRA-LEAN® AFRICAN MANGO IRVINGIA** 150 mg, 60 veg. caps	28.00	21.00	18.00			
01248	**IODINE COMPLETE** (Advanced) • 12.5 mg, 180 tablets	46.00	36.50				
01677	**IRON PROTEIN PLUS** • 300 mg, 100 caps	28.00	21.00	19.50			
01492	**IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX** (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00			
	J, K, L						
00056	**JARRO-DOPHILUS EPS®** • 60 veg. caps	22.95	17.21				
01759	**JARRO-DOPHILUS EPS®** • 30 caps	39.95	29.96				
01834	**K W/ADVANCED K2 COMPLEX** (Super) • 90 softgels	30.00	22.50	20.25			
01600	**KRILL HEALTHY JOINT FORMULA** • 30 softgels	32.00	24.00	21.75			
01050	**KRILL OIL** • 60 softgels	33.95	25.46				
00316	**KYOLIC® GARLIC FORMULA 102** • 200 veg. caps	26.45	19.84				
00214	**KYOLIC® GARLIC FORMULA 105** • 200 caps	27.45	20.59				
00789	**KYOLIC® RESERVE** • 600 mg, 120 caps	27.95	20.96				
01681	**LACTOFERRIN** • 60 caps	52.00	39.00	36.00			
00020	**LECITHIN** • 16 oz granules	18.00	13.50	12.00			
02055	**LIFE EXTENSION MIX™** • 315 tablets	80.00	60.00	52.00	43.75		

SUBTOTAL OF COLUMN 6

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02057	**LIFE EXTENSION MIX™ W/EXTRA NIACIN** • 315 tablets	80.00	60.00	52.00	43.75		
02054	**LIFE EXTENSION MIX™** • 490 caps	90.00	67.50	58.00	47.50		
02056	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz	80.00	60.00	52.00	43.75		
02065	**LIFE EXTENSION MIX™** • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02064	**LIFE EXTENSION MIX™** • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02066	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz w/o copper	80.00	60.00	52.00	43.75		
01608	**LIVER EFFICIENCY FORMULA** • 30 veg. caps	18.00	13.50	12.00			
01639	**5-LOX INHIBITOR W/APRÈSFLEX®** • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	**L-LYSINE** • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	**LYCOPENE** (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
	M						
01885	**MACUGUARD® OCULAR SUPPORT** • 60 softgels	22.00	16.50	14.85			
01886	**MACUGUARD® OCULAR SUPPORT w/ASTAXANTHIN** 60 softgels	42.00	31.50	28.50			
01459	**MAGNESIUM CAPS** • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	**MAGNESIUM (CITRATE)** • 160 mg, 100 veg. caps	9.00	6.75	5.63			
01908	**MEDITERRANEAN TRIM WITH SINETROL™-XPUR** 60 veg. caps	18.00	13.50	12.00			
01668	**MELATONIN** • 300 mcg, 100 veg. caps	5.75	4.31	3.75			
01083	**MELATONIN** • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	**MELATONIN** • 1 mg, 60 caps	5.00	3.75	3.47			
00330	**MELATONIN** • 3 mg, 60 caps	8.00	6.00	5.16			
00331	**MELATONIN** • 10 mg, 60 caps	28.00	21.00	18.00			
00332	**MELATONIN** • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
01734	**MELATONIN** (Fast-Acting Liquid) • 2 oz (Citrus-Vanilla)	12.00	9.00	8.25			
01787	**MELATONIN TIMED RELEASE** • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	**MELATONIN TIMED RELEASE** • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	**MELATONIN TIMED RELEASE** • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
01536	**METHYLCOBALAMIN** • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	**METHYLCOBALAMIN** • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	**MIGRA-EEZE™** (Butterbur) • 60 softgels	29.50	22.13	19.75			
01800	**MIGRA-MAG w/BRAIN SHIELD®** • 90 veg. caps	22.00	16.50	15.00			
01522	**MILK THISTLE** (European) • 60 veg. caps	34.00	25.50	22.50			
01822	**MILK THISTLE** (European) • 60 softgels	28.00	21.00	18.75			
01817	**MILK THISTLE** (European) • 120 softgels	44.00	33.00	30.00			
01698	**MIRAFORTE w/STANDARDIZED LIGNANS** (Super) • 120 caps	62.00	46.50	42.00			
01869	**MITOCHONDRIAL BASICS W/BIOPQQ®** • 30 caps	44.00	33.00	30.00			
01868	**MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®** • 120 caps	72.00	54.00	48.00			
00065	**MK-7** • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	**MSM** (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
	N						
01534	**N-ACETYL-L-CYSTEINE** • 600 mg, 60 veg. caps	14.00	10.50	10.13			
01904	**NAD+ CELL REGENERATOR™** • 100 mg, 30 veg. caps	34.00	25.50	19.50			
00066	**NATTOKINASE** • 60 softgels	25.50	19.13				
01807	**NATURAL APPETITE SUPPRESS** (Advanced) • 60 veg. caps	38.00	28.50	25.50			
00984	**NATURAL BP MANAGEMENT** • 60 tablets	44.00	33.00	30.00			
01892	**NATURAL ESTROGEN** • 60 veg. tabs	38.00	28.50	25.50			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01893	**NATURAL ESTROGEN W/O SOY ISOFLAVONES** • 30 veg. caps	32.00	24.00	21.00			
01626	**NATURAL SEX FOR WOMEN® 50+** (Advanced) • 90 veg. caps	59.00	44.25	34.00			
01444	**NATURAL SLEEP®** • 60 veg. caps	13.00	9.75	7.50			
01551	**NATURAL SLEEP® w/ MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	**NATURAL SLEEP® W/O MELATONIN** (Enhanced) • 30 caps	20.00	15.00	13.50			
01445	**NATURAL SLEEP® MELATONIN** • 5 mg, 60 veg. caps	18.00	13.50	12.00			
00987	**NATURAL STRESS RELIEF** • 30 veg. caps	28.00	21.00	18.00			
01121	**NERVIA®** • 60 softgels	49.95	37.46				
01603	**NEURO-MAG® MAGNESIUM L-THREONATE** • 90 veg. caps	40.00	30.00	27.00			
01602	**NEURO-MAG® L-THREONATE W/CALCIUM & VITAMIN D3** 225 grams • Lemon flavor	40.00	30.00	27.00			
01990	**NITROVASC w/CORDIART™** • 30 veg. caps	18.00	13.50	12.00			
01903	**NK CELL ACTIVATOR™** • 30 veg. tablets	45.00	33.75	31.50			
00373	**NO-FLUSH NIACIN** • 800 mg, 100 caps	19.00	14.25	12.75			
	O						
01824	**OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRACT** (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	**OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN** • 120 softgels	45.00	33.75	31.50	24.75		
01983	**OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	**OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
01981	**ONCE-DAILY HEALTH BOOSTER** • 60 softgels	52.00	39.00	36.00			
02001	**ONE-PER-DAY** • 60 tablets	22.00	16.50	15.00			
01328	**ONLY TRACE MINERALS** • 90 veg. caps	15.00	11.25	9.38			
	P						
01789	**PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL** 30 softgels	15.00	11.25	10.50	9.00		
01790	**PALMETTOGUARD® SUPER SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL** • 60 softgels	28.00	21.00	19.50	18.00		
00073	**PANCREATIN** • 50 caps	13.22	9.92				
01323	**PEAK ATP® WITH GLYCOCARN®** • 60 veg. caps	54.00	40.50	37.50			
00342	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 454 grams powder	109.95	82.46				
01080	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 270 veg. caps	79.95	59.96				
01811	**PEONY IMMUNE** • 60 veg. caps	36.00	27.00	24.00			
00673	**PGX® PLUS MULBERRY** (WellBetX®) • 180 veg. caps	34.95	26.21				
01676	**PHOSPHATIDYLSERINE CAPS** • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01436	**POLICOSANOL** • 10 mg, 60 veg. caps	20.00	15.00	11.25			
01423	**POMEGRANATE™** (Full-Spectrum) • 30 softgels	24.00	18.00	15.75			
00956	**POMEGRANATE EXTRACT** • 30 veg. caps	19.50	14.63	13.16			
01797	**POMI-T®** • 60 veg. caps	33.33	25.00	22.50			
01500	**PQQ CAPS W/BIOPQQ®** • 10 mg, 30 veg. caps	24.00	18.00	13.50	12.00		
01647	**PQQ CAPS W/BIOPQQ®** • 20 mg, 30 veg. caps	40.00	30.00	24.00	21.00		
00302	**PREGNENOLONE** • 50 mg, 100 caps	26.00	19.50	16.50			

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
00700	**PREGNENOLONE** • 100 mg, 100 caps	30.00	22.50	20.25			
**01373	**PRELOX® NATURAL SEX FOR MEN®** • 60 tablets	52.00	39.00	36.00			
01576	**PREVAGEN®** • 30 caps	60.00	45.00				
*01577	**PREVAGEN®** ES • 30 caps	70.00	60.00				
00525	**PROBOOST™ THYMIC PROTEIN A** • 30 packets	59.95	44.96				
01441	**PROGESTACARE® FOR WOMEN** • 4 oz cream	35.50	26.63	24.38			
01898	**PROSTATE FORMULA** (Ultra NAT) • 60 softgels	38.00	28.50	26.25	24.00		
01909	**PROSTAPOLLEN™** (Triple strength) • 30 softgels	28.00	21.00	18.75			
01742	**PROTEIN-ISOLATE** (Whey) Vanilla • 1 lb. powder	30.00	22.50	20.25			
01743	**PROTEIN-ISOLATE** (Whey) Chocolate • 1 lb. powder	30.00	22.50	20.25			
01770	**PROTEIN CONCENTRATE** (New Zealand Whey) Vanilla 520 grams	30.00	22.50	19.95			
01771	**PROTEIN CONCENTRATE** (New Zealand Whey) Chocolate 660 grams	30.00	22.50	19.95			
01812	**PROVINAL® PURIFIED OMEGA-7** • 30 softgels	27.00	20.25	18.00			
01508	**PTEROPURE®** • 50 mg Pterostilbene 60 veg. caps	32.00	24.00	22.50			
01209	**PUMPKIN SEED EXTRACT** (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01587	**PURE PLANT PROTEIN** • Vanilla 540 grams powder	38.00	28.50	26.25			
01637	**PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT** 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	**PYRIDOXAL 5'-PHOSPHATE** • 100 mg, 60 veg. caps	22.00	16.50	14.85			
	Q, R						
01309	**QUERCETIN** (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
01030	**RED YEAST RICE** (Bluebonnet) • 600 mg, 60 veg. caps	16.95	13.56				
00605	**REGIMINT** • 60 enteric-coated caps	19.95	14.96	14.00			
01708	**REISHI EXTRACT MUSHROOM COMPLEX** • 60 veg. caps	30.00	22.50	20.25			
01448	**REJUVENEX® BODY LOTION** • 6 oz	24.00	18.00	14.85	12.75		
01621	**REJUVENEX® FACTOR FIRMING SERUM** • 1.7 oz	65.00	48.75	37.50			
01220	**REJUVENEX®** (Ultra) • 2 oz	52.00	39.00	33.00	29.25		
00676	**REJUVENIGHT®** (Ultra) • 2 oz	39.95	29.96	27.00			
01410	**RESVERATROL W/PTEROSTILBENE** • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02031	**RESVERATROL W/NICOTINAMIDE RIBOSIDE** (Optimized) • 30 veg. caps	42.00	31.50	27.00			
02030	**RESVERATROL** (Optimized) • 60 veg. caps	46.00	34.50	31.00			
00889	**RHODIOLA EXTRACT** • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	**RIBOGEN™ FRENCH OAK WOOD EXTRACT** 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	**(D) RIBOSE POWDER** • 150 grams	27.50	20.63	18.56			
01473	**(D) RIBOSE TABLETS** • 100 veg. tabs	32.00	24.00	21.00			
01609	**RICH REWARDS® BREAKFAST GROUND COFFEE** • 12 oz. bag	13.00	9.75				
01730	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
01612	**RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE** 12 oz. bag	13.00	9.75				
01610	**RICH REWARDST® DECAFFEINATED ROAST GROUND COFFEE** 12 oz. bag	14.00	10.50				
01530	**RICH REWARDS® CRUCIFEROUS VEGETABLE SOUP** • 32 oz.	11.95	8.96	8.44			

SUBTOTAL OF COLUMN 9

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01208	**R-LIPOIC ACID** (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	**RNA CAPSULES** • 500 mg, 100 caps	17.95	13.46	12.12			
	S						
01432	**SAFFRON W/SATIEREAL®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
00358	**SAMe** (S-ADENOSYL-METHIONINE) 200 mg, 20 enteric coated tablets	16.00	12.00	10.50	9.75		
00557	**SAMe** (S-ADENOSYL-METHIONINE) 400 mg, 20 enteric coated tablets	28.00	21.00	18.00			
01740	**SEA-IODINE™** • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
00046	**SELENIUM** • 2 fl. oz dropper	11.95	8.96				
01679	**SE-METHYL L-SELENOCYSTEINE** • 200 mcg, 100 veg. caps	12.00	9.00	8.25			
00318	**SERRAFLAZYME** • 100 tablets	18.00	13.50	12.00			
01684	**SILYMARIN** • 100 mg, 50 veg. caps	9.25	6.94	6.19			
01249	**SINUS CLEANSER** • 4 oz. bottle	25.00	18.75				
01596	**SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT®** 30 veg. liquid caps	25.00	18.75	17.25			
00961	**SODZYME® w/GLISODIN® & WOLFBERRY** • 90 veg. caps	28.00	21.00	18.00			
00657	**SOLARSHIELD® SUNGLASSES** • Smoke color	12.99	9.74	8.63			
01097	**SOY EXTRACT** (Ultra) • 150 veg. caps	87.00	65.25	58.50			
00432	**STEVIA™** (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	**STEVIA™ ORGANIC LIQUID SWEETENER** (Better) • 2 oz	11.00	8.25				
01476	**STRONTIUM** • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01649	**SUPER ABSORBABLE SOY ISOFLAVONES** • 60 veg. caps	28.00	21.00	18.75			
01778	**SUPER SELENIUM COMPLEX** • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	T						
01723	**TART CHERRY EXTRACT W/STANDARDIZED CHERRYPURE®** 60 veg. caps	22.00	16.50	15.00			
01827	**TAURINE** • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
01918	**TEAR SUPPORT w/MAQUIBRIGHT®** • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	**L-TAURINE POWDER** • 300 grams	20.00	15.00	12.66			
13685	**TEN MUSHROOM FORMULA®** • 120 veg. caps	39.95	29.96				
01304	**THEAFLAVIN STANDARDIZED EXTRACT** • 30 veg. caps	18.00	13.50	12.00			
01683	**(L) THEANINE** • 100 mg, 60 veg. caps	24.00	18.00	15.38			
***01038	**THERALAC® PROBIOTICS** • 30 caps	47.95	35.96				
00668	**THYROID FORMULA** (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	**TMG POWDER** • 50 grams	14.00	10.50	8.25			
01859	**TMG** • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	**TOCOTRIENOLS** (Super-absorbable) • 60 softgels	30.00	22.50	21.00			
01278	**TOOTHPASTE** • 4 oz (Mint) tube	9.50	7.13	6.50			
01917	**TRANQUIL TRACT™** • 60 veg. caps	52.00	39.00	34.50			
01468	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT** 60 veg. caps	24.00	18.00	16.50			
01469	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL** • 60 veg. caps	32.00	24.00	22.20			
02003	**TRIPLE ACTION THYROID** • 60 veg. caps	36.00	27.00	24.00			
01803	**TRI SUGAR SHIELD®** • 60 veg. caps	36.00	27.00	24.00			
01386	**TRUFIBER™** • 180 grams	32.95	24.71				
01389	**TRUFLORA® PROBIOTICS** • 32 veg. caps	42.95	32.21				
01722	**L-TRYPTOPHAN** • 500 mg, 90 veg. caps	33.00	24.75	22.50			

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01721	**TRYPTOPHAN PLUS** (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02016	**TWO-PER-DAY** • 60 tablets	10.50	7.88	7.13			
02015	**TWO-PER-DAY** • 120 tablets	20.00	15.00	13.50			
02014	**TWO-PER-DAY** • 120 caps	22.00	16.50	15.00			
00326	**L-TYROSINE** • 500 mg, 100 tablets	12.98	9.74				
	V						
00213	**VANADYL SULFATE** • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
00408	**VENOTONE** • 60 caps	18.95	14.21	12.00			
01327	**VINPOCETINE** • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	**VITAMIN B3 NIACIN** • 500 mg, 100 caps	7.65	5.74	4.99			
00098	**VITAMIN B5** • 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88	7.04			
01535	**VITAMIN B6** • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	**VITAMIN B12** • 500 mcg, 100 lozenges	8.75	6.56	5.44			
01634	**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
00927	**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 250 veg. tablets	25.50	19.13	17.44			
00084	**VITAMIN C POWDER** (BUFFERED) • 454 grams	23.95	17.96	16.50			
01736	**VITAMIN C-MAGNESIUM CRYSTALS** (EFFERVESCENT) 180 grams	20.00	15.00	13.50			
01732	**VITAMIN D3** • 2,000 IU, 1 fl oz, Mint flavor	28.00	21.00	18.75			
01753	**VITAMIN D3** • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	**VITAMIN D3** • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	**VITAMIN D3** • 5,000 IU, 60 softgels	11.00	8.25	7.43			
01718	**VITAMIN D3** • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	**VITAMIN D3 W/SEA-IODINE™** • 5,000 IU, 60 caps	14.00	10.50	9.38			
00864	**VITAMIN D3 LIQUID EMULSION** • 2,000 IU, 1 oz.	28.00	21.00	18.75			
01840	**VITAMINS D AND K W/SEA-IODINE™** • 60 caps	24.00	18.00	16.50			
01763	**VITAMIN E** (Natural) • 400 IU, 100 softgels	30.00	22.50	21.00	19.50		
01225	**VITAMIN K2** (Low-dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
	W						
01902	**WAIST-LINE CONTROL™** • 120 veg. caps	42.00	31.50	28.50			
	X, Y						
01919	**X-R SHIELD** • 90 veg. caps	15.00	11.25	9.75			
00409	**XYLIWHITE™ MOUTHWASH** • 16 oz	10.00	7.50				
	Z						
01813	**ZINC HIGH POTENCY** • 50 mg, 90 veg. caps	7.95	5.96	5.25			
01561	**ZINC LOZENGES** • 60 veg. lozenges	9.00	6.75	6.00			
01961	**ZINC LOZENGES** (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
**01051	**ZYFLAMEND® WHOLE BODY** • 120 softgels	64.95	48.71				
	BOOKS						
33880	**OUTSTANDING HEALTH:** THE 6 ESSENTIAL KEYS TO MAXIMIZE YOUR ENERGY AND WELL BEING by Michael Galitzer, MD & Larry Trivieri Jr. • 2015	24.95	18.71				
33878	**TESTOSTERONE REPLACEMENT THERAPY** by Dr. John Crisler • 2015	19.99	14.99				
33877	**THE TRUTH ABOUT MEN AND SEX** by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74				
33876	***TOX*-SICK** • by Suzanne Somers • 2015	26.00	19.50				
33875	**DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN** • by Sandeep Jauhar • 2015	26.00	19.50				
	SUBTOTAL OF COLUMN 11						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
33874	**MISSING MICROBES** • by Martin J. Blaser, MD • 2014	28.00	21.00				
33873	**EATING ON THE WILD SIDE** • by Jo Robinson • 2014	16.00	12.00				
33872	**GET SERIOUS** • by Brett Osborn, MD • 2014	24.95	18.71				
33868	**TOXIN TOXOUT:** GETTING HARMFUL CHEMICAL OUT OF OUR BODIES AND OUR WORLD • by Bruce Lourie and Rick Smith • 2014	25.99	19.49				
33867	**THE COMPLETE MEDITERRANEAN DIET** by Michael Ozner, MD • 2014	19.95	14.96				
33869	**UNLEASH THE POWER OF THE FEMALE BRAIN** by Daniel Amen, MD • 2014	16.00	12.00				
33870	**MAGNIFICENT MAGNESIUM** by Dennis Goodman, MD • 2014	14.95	11.21				
33864	**THE SUPPLEMENT PYRAMID** by Michael A. Smith, MD • 2014	24.95	18.71				
DPT05	**DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION** (Hardcover) • 2014	69.95	39.95	36.00			
33865	**THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS]** by Sergey A. Dzugan, MD, PhD • 2014	29.95	22.46				
33862	**I'M TOO YOUNG FOR THIS** • by Suzanne Somers • 2013	26.00	19.50				
33835	**PHARMOCRACY** • by William Faloon • 2011	24.00	9.60	8.00			
33854	**THE GREAT CHOLESTEROL MYTH** • by Jonny Bowden, PhD, CNS and Stephen Sinatra, MD • 2012	19.99	14.99				
33958	**THE VITAMIN D SOLUTION** by Michael F. Holick, PhD, MD (Paperback) • 2013	16.00	12.00				
33838	**YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY** by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	**KNOCKOUT** • by Suzanne Somers • 2009	25.99	17.00				
33809	**TESTOSTERONE FOR LIFE** by Abraham Morgentaler, MD • 2008	16.95	11.87				
33696	**LIFE EXTENSION REVOLUTION** by Philip Lee Miller, MD (Paperback)	16.00	12.00				
33805	**MIAMI MEDITERRANEAN DIET WITH 300 RECIPES** by Michael D. Ozner, MD, FACC, FAHA (Hardcover) • 2008	24.95	16.25				
33906	**THE MIGRAINE CURE** • by Sergey Dzugan, MD, PhD • 2006	24.00	15.60				
	SUBTOTAL OF COLUMN 12						

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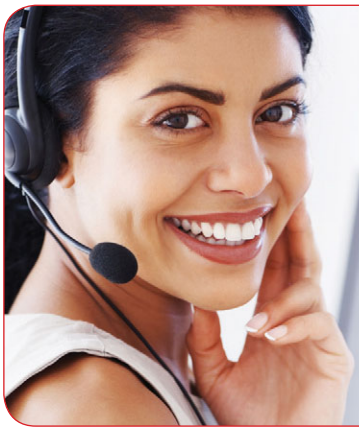

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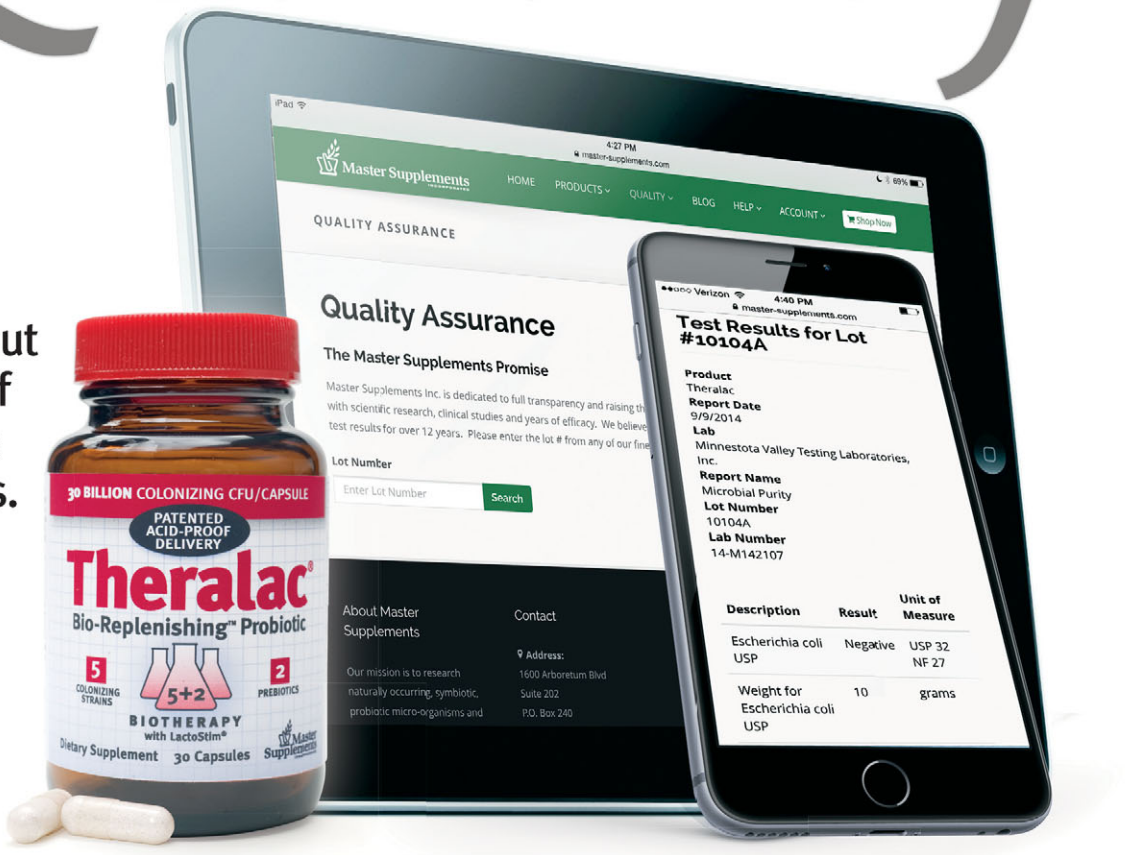

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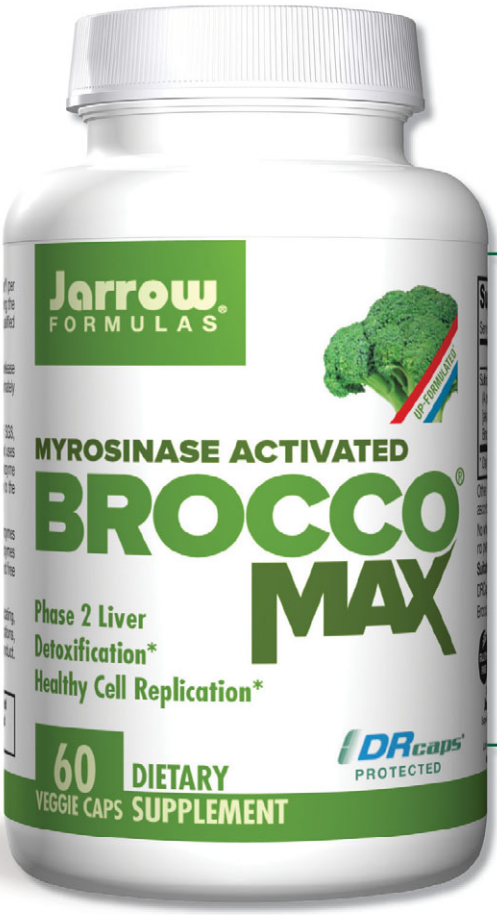

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A Clinically Proven and Patented Medicinal Mushroom Extract

Every year, 23 million days of work are lost to feeling under the weather. While most people view immune challenges as part and parcel of the cold weather season, they are not, in fact, inevitable. After all, many people manage to stay well all year round, even though they are exposed to the same environments as those who have weaker resistance. The reason is because the environment is not responsible for whether you feel well or not. Your immune system is.

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How AHCC® Works

AHCC® is a patented, fermented, medicinal mushroom extract whose efficacy is **supported by over 20 human clinical research studies**. It has been shown to modulate immune response in several ways.

- **AHCC®** enhances the production of cytokines, the messengers of the immune system, so that your whole immune team can coordinate an organized response to outside threats.*
- **AHCC®** boosts populations of macrophages, the "street cleaners" of your immune system, which pick up foreign substances and cellular debris.*
- **AHCC®** increases the activity of natural killer (NK) cells, your innate immune system's first line of defense against invasion.*
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STRONG SUPPORT FOR SORE MUSCLES

After Exercise and Everyday Exertion

Tart cherries are chockfull of compounds found to block **COX-1** and **COX-2** inflammatory enzymes.[1] Benefits of the fruit include:[2-5]

- **Rapid muscle recovery after exercise, and**
- **Fast relief from the minor aches, discomfort, and stiffness following everyday activities.**

Clinically Validated

Numerous studies have confirmed the muscle-supporting benefits of tart cherries. One clinical trial found that consuming tart cherry juice twice daily produced a substantial decrease in muscle symptoms related to exercise. In the same study, loss of strength due to exercise over four days was reduced from **22%** to only **4%**.[4]

Anthocyanins

Anthocyanins—the powerful flavonoids found in dark-pigmented fruit—have been studied for their many advantages, including **heart**, **cellular**, and **cognitive health**.[6-8] Tart cherries have a higher content of anthocyanins than many other fruits.[1]

Life Extension® offers **100%** natural **Tart Cherry Extract with Standardized CherryPURE®**, which opens the door to the positive benefits of continuous exercise—**at any age**! This formulation provides all the muscle-supporting benefits of tart cherries and matches that anthocyanin dose used in successful clinical trials by providing a standardized **40 mg** dose of anthocyanins in each vegetarian capsule.[2,4]

Non-GMO

CherryPURE® is a registered trademark of Shoreline Fruit, LLC.

References

1. *Phytomedicine.* 2001 Sep;8(5):362-9.
2. *J Int Soc Sports Nutr.* 2010 May 7;7:17.
3. *Scand J Med Sci Sports.* 2010 Dec;20(6):843-52.
4. *Br J Sports Med.* 2006 Aug;40(8):679-83.
5. *Am J Vet Res.* 2009 Jun;70(6):758-63.
6. *Mol Nutr Food Res.* 2007 Jun;51(6):675-83.
7. *Biochemistry (Mosc).* 2004 Jan;69(1):75-80.
8. *Adv Nutr.* 2011 Jan;2(1):1-7.

Tart Cherry Extract with Standardized CherryPURE®

Item #01723 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	$22	**$16.50**
4 bottles		**$15 each**

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ArthroMax® Advanced with UC-II® and AprèsFlex® is a multi-nutrient formula based on scientific data on natural support for joint health. The ArthroMax® formula provides more joint support than ever before, enhanced with two innovative, clinically validated ingredients: AprèsFlex® and UC-II®.

Better Absorption For Optimum Benefit

AprèsFlex® represents a quantum leap forward in the delivery to aging joints of **boswellia**, long prized for its ability to help with inflammatory issues. It is a superior inhibitor of the enzyme ***5-lipoxygenase*** or *5-LOX*.

Excess activity of 5-LOX results in the accumulation of ***leukotriene B4***, a pro-inflammatory compound that affects aging joints. **Boswellia** has been shown to bind directly to the 5-LOX enzyme in our bodies, blocking it from facilitating production of pro-inflammatory leukotrienes.[1,2]

AprèsFlex® boswellia *absorbs* into the blood **52% *better*** than previously available forms of boswellia, for superior effectiveness.

ArthroMax® Advanced With UC-II® And AprèsFlex®

In addition to AprèsFlex®, ArthroMax® contains a novel form of standardized cartilage: **UC-II®**. Data show it helps with immune issues that can impact joint discomfort and ease of motion in aging individuals.

ArthroMax® Advanced with UC-II® & AprèsFlex®

Item #01618 • 60 capsules

	Retail Price	Your Price
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4 bottles		**$24 each**

Non-GMO

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References

1. *Wien Med Wochenschr.* 2002;152(15-16):373-8.
2. *J Ethnopharmacol.* 2006 Sep 19;107(2):249-53.

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