IODINE DEFICIENCY INCREASES BREAST CANCER RISK

How FDA Regulation Bankrupts America

Curing Today’s Health Care Cost Crisis

Natural Solutions For Addiction

Omega-3 Fatty Acids Reduce Premature Death Risk Up to 85%

NEW BOOK EXPOSES GOVERNMENT CORRUPTION AND HOW YOU CAN STOP IT
High Potency FAT-SOLUBLE NUTRIENTS in ONE Softgel

Most people don’t get enough oil-based nutrients like vitamin K, lycopene, and gamma tocopherol. This problem is solved with a one-per-day softgel called Life Extension® Super Booster. It provides high potencies of fat-soluble compounds lacking in dry powder formulas along with other nutrients.

Just one **SUPER BOOSTER** provides:

- **VITAMIN K2** Scientific studies show vitamin K2 provides superior benefits for the bones, arteries, and other tissues. The MK-4 form of vitamin K2 is the most rapidly absorbed and is now routinely used in Japan to maintain healthy bone density. MK-4, however, only remains active in the blood for a few hours. The MK-7 form of K2, on the other hand, remains bioavailable to the human body over a sustained 24-hour period. Super Booster provides a potent dose of MK-7 and MK-4 to keep calcium in the bone and out of the arteries.

- **GAMMA TOCOPHEROL** If one consumes only alpha tocopherol, the critically important gamma tocopherol is displaced from cells within the body. While alpha tocopherol vitamin E inhibits lipid peroxidation, the gamma tocopherol form quenches the dangerous peroxynitrite free radical. It is especially important for those who take vitamin E supplements to make sure they consume at least 200 mg a day of gamma tocopherol.

- **LUTEIN** The carotenoid lutein helps maintain healthy cell division, supports the macula of the eye, and protects the endothelial lining of the arteries.

- **LYCOPENE** Evidence suggests that people who ingest the carotenoid lycopene enjoy healthier prostate function. Lycopene also helps guard against LDL oxidation.

- **GINKGO** Hundreds of studies substantiate the multifaceted effects of Ginkgo biloba in promoting healthy circulatory and neurological function.

- **CHLOROPHYLLIN** Scientific studies indicate that chlorophyllin may protect against environmentally induced damage to DNA.

A bottle of 60 **Super Booster** softgels retails for $42. If a member buys four bottles, the price is reduced to just **$28.50** per bottle.

The **Super Booster** saves consumers **huge dollars** by combining a wide variety of costly nutrients into one daily softgel. If you add up the price of the individual ingredients contained in the **Super Booster**, you would spend **two to three times more** for this potency if taken separately.

**JUST ONE SOFTGEL OF SUPER BOOSTER SUPPLIES:**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin K2 (as menaquinone-7)</td>
<td>100 mcg</td>
</tr>
<tr>
<td>Vitamin K2 (as menaquinone-4)</td>
<td>1000 mcg</td>
</tr>
<tr>
<td>Vitamin K1 (as phytonadione)</td>
<td>1000 mcg</td>
</tr>
<tr>
<td>Mixed tocopherols</td>
<td>359 mg</td>
</tr>
<tr>
<td>(providing Gamma Tocopherol 230 mg)</td>
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<tr>
<td>Ginkgo extract</td>
<td>120 mg</td>
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<tr>
<td>Chlorophyllin</td>
<td>100 mg</td>
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<tr>
<td>Sesame lignans</td>
<td>20 mg</td>
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<tr>
<td>Lycopene</td>
<td>10 mg</td>
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<tr>
<td>Lutein</td>
<td>2 mg</td>
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<tr>
<td>Selenium (as Se-Methyl L-Selenocysteine)</td>
<td>67 mcg</td>
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<tr>
<td>Selenium (as L-Selenomethionine)</td>
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<td>Selenium (as Sodium selenite)</td>
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<tr>
<td>Vitamin B12</td>
<td>300 mcg</td>
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<tr>
<td>Vitamin C</td>
<td>95 mg</td>
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<tr>
<td>Zinc</td>
<td>10 mg</td>
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</table>

**Contains corn and sesame. CAUTION:** If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Lyc-O-Mato® is a registered trademark of LycoRed Natural Products Limited.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

To order Super Booster, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com).
28  SLASH YOUR RISK FOR PREMATURE DEATH WITH OMEGA-3s
Most health-conscious consumers (and cardiologists) know about the benefits of omega-3 fatty acids found in fish oil for heart health. Startling new data show that omega-3 supplementation can reduce your risk of dying prematurely by as much as 85%.

42  SILENT EPIDEMIC OF IODINE DEFICIENCY
Iodine levels in table salt have plummeted in recent years. Nearly 74% of adults may not be getting enough as a result. Discover this widespread deficiency’s link to heart disease, psychiatric disorders, and breast cancer and how easy it is to correct.

54  COMBATING AGE-RELATED BRAIN DETERIORATION
Your brain is shrinking at this very moment, the result of unavoidable age-related structural degradation. Starting at age 30, this process leads to everything from cognitive decline to learning disabilities. Dr. Eric Braverman outlines ways to reverse brain aging.

68  NATURAL WAYS TO CURE ADDICTION
There is a drug-induced death in this country every 15 minutes. Despite the trillion dollars spent so far on the “drug wars” and addiction treatment programs that rely on counseling, relapse rates hover at 90%. One forward-thinking doctor has achieved a relapse rate of just 9% using specific nutrients, hormones, and gut ecology restoration.

80  BOOK EXCERPT: WHEAT BELLY
Generations ago, 42-inch waistlines were rare, childhood obesity virtually nonexistent—and no “fitness craze” kept people thin. In this compelling excerpt from his latest work, Dr. William Davis smashes conventional wisdom about healthy “whole grains” and makes the case for one of the chief culprits behind today’s obesity epidemic: wheat.

DEPARTMENTS

21  IN THE NEWS
Creatine reduces statin drug side effects; soluble fiber busts belly fat; fisetin prevents diabetic complications; and more.
Feeble bones severely hamper quality of life and put aging humans at risk for injury due to possible breaks or fractures.

**Bone Restore** combines critical bone boosting nutrients into one superior formula.

**Bone Restore** includes highly absorbable forms of calcium, a bioavailable form of boron, along with vitamin D3, magnesium, zinc, manganese, and silicon.

**Bone Restore** comes in fast-release capsules, making the minerals and other nutrients immediately available for absorption into the bloodstream.

The retail price for 150 capsules of **Bone Restore** is $22.50. If a member buys four bottles, the price is reduced to just $14.63 per bottle.

**To order Bone Restore, call 1-800-544-4440 or visit www.LifeExtension.com**

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Contains corn.

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DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. Patent 6,706,904 and patents pending.

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These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
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John Boik, PhD, is the author of two books on cancer therapy, Cancer and Natural Medicine (1996) and Natural Compounds in Cancer Therapy (2001). He obtained his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University Department of Statistics. He is currently president of New Earth BioMed, a nonprofit cancer research corporation that studies mixtures of natural products.

Eric R. Braverman, MD, is director of the Place for Achieving Total Health (PATH Medical and the PATH Foundation) in New York City. Dr. Braverman received his BA from Brandeis University Summa Cum Laude/Phi Beta Kappa and his MD from New York University Medical School with honors. He is the author of Younger You (2006) and Younger Thinner You (2009) and over 100 research papers and is clinical assistant professor of integrative medicine at the Department of Neurosurgery at Cornell Weill Medical College, as well as a lecturer on mild cognitive decline.

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Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is triple board-certified in internal medicine, sleep disorder medicine, and anti-aging medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the new University of Central Florida Medical School.

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Ralph W. Moss, PhD, is the author of books such as Antioxidants Against Cancer, Cancer Therapy, Questioning Chemotherapy, and The Cancer Industry, as well as the award-winning PBS documentary “The Cancer War.” Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

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Stephen B. Strum, MD, is a medical oncologist who has specialized in prostate cancer treatment since 1983. He is co-founder and past medical director of the Prostate Cancer Research Institute. Currently, he directs a practice for prostate cancer patients in Ashland, OR.

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Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Renton, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 11 books and publishes Nutrition and Healing, a monthly newsletter with a worldwide circulation of more than 100,000.
Since Life Extension® introduced CoQ10 in 1983, our scientists have continued to develop increased potency and absorbability.

**Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** contains PrimaVie® shilajit that doubles levels of CoQ10 in the mitochondria.1

Combining CoQ10 and shilajit produced a 56% increase in cellular energy production in the *brain*, and in muscle there was a 144% increase in cellular energy production.2

Shilajit boosts CoQ10’s beneficial effects by stabilizing CoQ10 in the superior ubiquinol form, which prolongs its action at the cellular level.3,4

Additionally, shilajit facilitates the more efficient delivery of CoQ10 into the mitochondria, which results in enhanced cellular energy.5-9

Shilajit helps the mitochondria convert fats and sugars into the body’s main source of energy, ATP (adenosine triphosphate).5-9

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

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

References:

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How Regulation of Medicine is Bankrupting the United States and What Congress Can Do to Stop It

BY WILLIAM FALOON

A fierce debate is raging as to who will pay for this nation’s skyrocketing sick-care costs.

Private companies have scaled back sharply on health care coverage they used to provide. Employees now pay an increasing percentage of their medical insurance premiums, along with higher deductibles, co-pays, and no-pays (i.e., exclusions). Many businesses provide no health coverage to their employees.1,2

Based on the median income in the United States, the typical family cannot come close to paying the staggering cost of health care themselves.

It seems rather odd, but since neither business nor individuals can afford today’s sick-care costs, the burden is increasingly being borne by the sector least able to pay, i.e., heavily indebted state and federal governments.

The federal government is already saddled with a huge unfunded Medicare liability. No one has figured out where the money will come from to cover these future health care costs.

To put this into context, the most recent estimate of Medicare’s unfunded liability is $24.6 trillion.3 Yet total federal tax revenues taken in annually (which include Medicare premiums) are only around $2 trillion.4,5 As our current President stated last year, we are approaching a point where the government will have to spend more money on Medicare than every other federal program combined!6

AS WE SEE IT
The most recent government report states that the Medicare hospital trust fund will go bankrupt five years sooner than what was projected a mere twelve months earlier.7

None of these numbers are reliable. Congress and agency bureaucrats use all kinds of accounting gimmicks when projecting Medicare’s date with insolvency.

For instance, the unfunded Medicare liability was pegged at $37 trillion in 2009.8 That means the government should have had $37 trillion in a trust fund earning interest in order to meet its future obligations. But politicians constantly manipulate the numbers. The latest report reduced Medicare’s official unfunded liability to $24.6 trillion. The reason for these wild fluctuations is that in any given year, officials can create “assumptions” out of thin air, like assuming doctors will take major pay cuts. Congress has not enacted these pay cuts, but bureaucrats pretend they do in order to understate Medicare’s true unfunded liability.9

What no one in government understands is that health care costs are set to skyrocket even further as new drugs the FDA is approving are costing around $100,000 per patient.10-12 Be it $24.6 trillion or $37 trillion, the government does not have the money to cover its Medicare obligations.

And Medicaid, which provides health care for lower income people, also has trillions of dollars of unfunded liabilities that are being paid with tax and newly issued debt dollars.13

Bernard Madoff was sentenced to 150 years in prison because he took investors’ money and diverted it to other purposes. The federal government forced Americans to pay Medicare premiums their entire lives. Instead of those premiums being placed in a reserve fund for future use, they were squandered on whatever was most politically expedient at the time, which included overpaying those with the right connections.

While Madoff will spend the rest of his life incarcerated, no one talks about bringing civil or criminal charges against those responsible for the largest Ponzi scheme in the history of the human race, i.e., Medicare with its $24.6 trillion of admitted unfunded liabilities.

Like the federal government, many local and state governments have also operated a Ponzi scheme of unfunded pension and health care liabilities they cannot pay.14-16 Since the federal government is mathematically insolvent, it seems ludicrous to assume that exorbitant sick-care costs can be resolved by any level of government.

While politicians aimlessly point fingers as to who should pay America’s medical bills, please remember that there is a real-world solution. Health care in the United States is so tightly regulated that it in many ways resembles the inefficiencies of Maoist China, where the economy was suffocated by erratic and illogical governmental decrees. As China lifted its regulatory stranglehold, prosperity flourished. It’s time for US leaders to follow China’s example and stop over-regulating medicine!
Even I Was Shocked!

For the enlightenment of new members, please know that the Life Extension Foundation® has sounded the alarm bells since the early 1980s about the health care cost crisis that must now be confronted. We said that unless the shackles of regulation are removed, this nation faced inevitable economic insolvency with little in the way of cures being found for age-related diseases.

I have written dozens of articles and made hundreds of media appearances attacking today's broken health care system. I was not aware until recently, however, of how much my own health insurance premiums had gone up, since I was covered under a group plan. For me, my wife, and two children, Life Extension is paying a staggering $17,000 per year! Since our group plan insures over 300 people, we obtain a considerable discount off the individual rate—yet the premiums, deductibles, co-pays, and no-pays are worse than ever.

I’d like to think Life Extension is the most efficiently run organization in the world. We can, at the moment, afford these outrageous health insurance premiums for our dedicated employees. But I know many businesses and individuals cannot, and certainly not the government, which is unable to pay for what it is already on the hook for.

We Have Been Deceived…

Look back over the past 30 years and ask how many cures for the diseases of aging have been found? One can argue the number is near zero!

Americans have paid outlandish prices for prescription drugs under the guise that pharmaceutical profits would fund research leading to medical breakthroughs. The problem is that real-world discoveries have not manifested. One can point to some treatments that prolong patient survival, but these are offset by lethal side effects inflicted by fraudulently approved therapies.17-19 The fact is that few real cures have occurred despite Americans spending more health care dollars than anyone else.

Unregulated medicine has made considerable strides, but the majority of the population does not know about these approaches, and vested financial interests have spent billions to ensure that the media, politicians, and bureaucrats continue suppressing them.

We have been deceived by those who associate regulations with beneficial outcomes. As it relates to medical progress, the opposite has occurred, i.e., excessive regulation is causing millions to suffer and die needlessly while health care costs skyrocket.20

Few understand that the underlying purpose of regulations is to provide a government-protected advantage to the group favoring the regulation. It’s not about how a regulation will protect the public, but a matter of how it can financially benefit a special interest.21

An often-cited example is the petition drug maker Wyeth filed with the FDA asking that a natural human form of estrogen called estriol be banned.22,23 The female hormone drugs Wyeth is selling (Premarin® and PremPro®) have been shown to inflict all kind of lethal side effects.24-31 Instead of spending money on research to come up with safer forms of estrogen (such as combining natural estrogens with indole-3-carbinol),32-34 it was much cheaper to persuade political hacks at the FDA to outlaw the competition (i.e., bioidentical estriol hormone compounds).35

Pharmaceutical companies have spent enormous dollars persuading the FDA to re-classify nutrients like pyridoxamine as prescription drugs so that they can monopolize them for their own economic benefit.36 If it were not for aggressive letter-writing campaigns to Congress by consumers, all dietary supplements would be expensive prescription drugs by now.
FDA—Failure, Deception, and Abuse

In 2010, a 498-page book was published exposing how FDA over-regulation has destroyed citizens’ health and this nation’s finances. Many more pages could be added based on what we have published over the past year alone.

The magnitude of the artificially inflated costs are beyond obscene. For example, an increasingly popular prescription drug in the United States is a testosterone ointment called AndroGel®. Last time we checked, pharmacy chains sell a one-month supply for $348. Many men who try it will continue it each month for the rest of their lives.

The cost of the active ingredient in AndroGel® is around $4. It costs a few more dollars to put it into ointment form under good manufacturing practices. So for less than $15 retail, consumers could purchase the same amount of testosterone as is in AndroGel®—if it were not for FDA over-regulation.

Even though transdermal testosterone delivery technology has been known for decades, and the patent for bioidentical testosterone expired a long time ago, the FDA only allows a chosen few pharmaceutical companies to sell it. When a compounding pharmacy tries to develop more efficient ways to make testosterone creams, FDA inspectors use existing regulations to stop them. The regulations mandate that individually compounded drugs be made from scratch. If a pharmacy tries to produce larger quantities in bulk, it is no longer classified as “compounded” according to FDA regulations and is therefore illegal.

In this Orwellian tragedy, the annual cost of regulated AndroGel® comes to $4,176 whereas the same amount of topical testosterone in an unregulated environment would drop to only $180 a year.

Regulated testosterone thus costs 23 times more than free-market testosterone. And look who pays for it! If you have health insurance, you will likely face a $25-50 co-pay each month, while your insurance company is fleeced for the balance. If you are a low income individual and don’t have insurance, there are government programs (like Medicaid) that will pay the full retail price of AndroGel®. If you are not indigent and have no insurance, then you are stuck with the entire tab. Be you a taxpayer, co-payor, or out-of-pocket payer your finances are being eaten away by these absurd regulations. Is it any wonder why medical insurance premiums are increasing so sharply?

Consumers have to band together to demand Congress introduce emergency legislation that repeals the absurd over-regulation of medicine that exists today.
I have written a new book titled *Pharmocracy* that details how egregious pharmaceutical company profits are protected by regulations, and how these vested interests will go to any corrupt length to ensure these regulations are perpetuated no matter how inane they are.38,39

**How Regulated Costs Add Up**

Institutionalized corruption artificially inflates the cost of virtually every health care service. Going back to the AndroGel® example, we estimate that more than 80 million American men could benefit by restoring their testosterone levels to youthful ranges.40 If these men are forced to use only FDA-approved testosterone drugs, the excess cost to the United States will be $319 billion each year for this one drug.

It used to be just a few years ago that when the entire federal deficit reached $300 billion, the public and some politicians complained. Yet the overpayment Americans are stuck with for this one class of drug (AndroGel® and others) because of FDA over-regulation may exceed previous federal deficits unless the law is amended.

When one considers there are thousands of medically related products and services that are artificially inflated by senseless regulations, it becomes clear that radical change is required to avoid an economic meltdown.

Governments collapse when ineptitude and corruption reach such egregious magnitudes that the citizenry has no choice but to revolt.

Since the year 1980, the Life Extension Foundation® has published articles that expose how over-regulation in the United States causes lifesaving medications to be delayed or suppressed altogether. We have also explained the extortionist costs to consumers who are forced to pay for what are too often dangerous FDA-approved therapies.

The new book *Pharmocracy* presents factual and irrefutable logic to reform today’s broken health care system.

While *Pharmocracy* uncovers egregious FDA incompetence and abuse, Congress is the body of government that provides FDA with enabling laws that result in needless suffering and death—while the nation descends into financial ruination.

Implementing the free-market approaches advocated in this book can spare Medicare and Medicaid from insolvency, while significantly improving the health and productivity of the American public.

*Pharmocracy* provides a rational basis to remove the suffocating compulsory aspect of health care regulation and allow free-market forces to compete against government-sanctioned medicine.

The cover price for each copy of *Pharmocracy* is $24. Life Extension members can obtain it at a 60% discount and pay only $9.60 a copy.

The unprecedented step we have taken is to offer four copies to Life Extension members for only $32 (or $8 each). The reason we want you to purchase four copies is to send one to your representative and two senators. We believe if enough constituents send a copy of *Pharmocracy* to Congress, Congressional members will be forced to recognize the obvious free-market solutions to today’s health care costs crisis, and know that a large segment of the public supports them against pharmaceutical interests.

To order one or four copies of *Pharmocracy*, call 1-800-544-4440 or visit www.lef.org/pharm
Even Compounded Testosterone Costs Too Much

As stated earlier, FDA regulations prohibit **compounding pharmacies** from making production-scale batches of popular drugs. Each compounded drug must be individually formulated by a licensed pharmacist. The result is that the labor involved in making a compounded drug comprises more than what the active ingredient costs.

But there are additional regulations that add even greater costs. Consumers require a prescription to buy compounded testosterone just like they do with FDA-approved testosterone. While competent physician supervision can enhance the safety and efficacy of a testosterone replacement program, the frank reality is that the majority of prescriptions for drugs like AndroGel® are not prescribed by physicians who understand how to optimally manage hormone replacement in men. Seldom are estrogen levels monitored to protect against estrogen overload that can occur when too much testosterone converts (aromatizes) into estrogen in an aging man’s body.41,42

An advantage with compounded testosterone is that if a physician knows how to write a prescription for it, they often have received training on follow-up monitoring. Compounded testosterone cream can be obtained for less than $30 a month, compared to the $348/month price for AndroGel®. Either form can contain the same amount of bioidentical testosterone.

**Compounded testosterone cream** is 91% less expensive than FDA-protected drugs, yet compounded testosterone is still twice as expensive as it needs to be because of governmental over-regulation.

In dealing with runaway health care costs, a solution is to make drugs like testosterone available to men over age 40 **without** the need of a doctor’s visit. There have been companies that have physicians review blood tests over the phone and prescribe testosterone, but FDA and state licensing boards have shut many of these down.43 Corrupt regulations ensure that efficiencies that would slash health care cost (at the expense of pharmaceutical profits) are outlawed.

**Simple Solution to Avert Economic Ruination**

Life Extension initiated a petition drive back in the 1980s to allow individual Americans to “opt-out” of the FDA’s regulatory umbrella. Our rationale was that this would provide consumers with more advanced treatments at lower prices.

Hundreds of our enlightened members petitioned, requesting liberation from the FDA stranglehold. The public, Congress, and media were apathetic at that time. The FDA was far from lethargic. They responded to our petition in a way that resembled an angry hornet’s nest when disturbed (or how some dictators respond to street protestors). The notion that we dared challenge the FDA’s absolute authority resulted in years of legal battles in which the FDA did everything in its power to destroy us.44

Move forward to today, and the political climate has turned around. The health care cost crisis we long ago predicted has evolved into a harsh reality no one can ignore. It is mathematically
impossible to solve it by forcing one group to pay regulated medicine’s inflated costs. The only salvation are the free-market reforms we long ago drafted.

Our proposal is quite simple. Amend the law to allow good manufacturing practice (GMP)-certified facilities to produce generic prescription drugs that do not undergo the excessive regulatory hurdles that force consumers to pay egregiously inflated prices.

To alert consumers when they are getting a generic whose manufacturing is not as heavily regulated as it is currently, the law would mandate that the label of these less-regulated generic drugs clearly states:

“This is not an FDA-approved manufactured generic drug and may be ineffective and potentially dangerous. This drug is NOT manufactured under the same standards required for an FDA-approved generic drug. Purchase this drug at your own risk.”

By allowing the sale of these less costly generics, consumers will have a choice as to what companies they choose to trust.

Equally important in our proposals is allowing consumers to be told about the off-label benefits of prescription drugs, such as the extensive body of evidence that metformin may help prevent type 2 diabetes\(^{45,46}\) (and not just treat it) and that metformin may also prevent and help treat certain cancers\(^{47-54}\).

A concern critics raise regarding this free-market solution is safety. Who will protect consumers from poorly made generic drugs, they ask?

First of all, there will be the same regulation of these drugs as there are with GMP-certified supplement makers. FDA inspectors will visit facilities, take sample products, and assay to ensure potency of active ingredient and dissolution. Laboratories that fail to make products that meet label claims would face civil and criminal penalties from the government.

Secondly, there is no incentive not to provide the full potency of active ingredient in these less regulated generic drugs. The price of the active ingredients makes up such a small percentage of the overall cost that a manufacturer would be idiotic to scrimp on potency\(^{55}\).

Companies that foolishly make inferior generics will be viciously exposed by the media, along with the FDA, consumer protection groups, and even prescribing physicians, who will be suspicious if a drug is not working as it is supposed to.

Companies producing inferior products will be quickly driven from the marketplace as consumers who choose to purchase these lower-cost generics will seek out laboratories that have reputations for making flawless products.

Substandard companies would not only be castigated in the public’s eye, but face civil litigation from customers who bought the defective generics. When one considers that GMP-certified
manufacturing plants can cost hundreds of millions to set up, a company would guarantee itself future insolvency if it failed to produce generic drugs that met minimum standards.

**Pharmaceutical Company Propaganda**

No matter how many facts show that free-market generic drugs can be made safe, there are alarmists who believe that even if one person suffers a serious adverse event because of a lower-cost generic drug, then the law should not be amended to allow the sale of these *less-regulated* products.

What few understand is that enabling lower-cost drugs to be sold might *reduce* the number of poorly made drugs. The reason is that prescription drug counterfeiting is a major issue today. Drugs are *counterfeited* because they are so expensive. Yet in the free market environment we espouse, a month’s supply of the popular cholesterol-lowering drug like simvastatin would sell for only $3. It is difficult to imagine anyone profiting by counterfeiting it. So amending the law to enable these super low-cost drugs to be sold might reduce the counterfeiting that exists right now.

Another reason these *less-regulated* generics will do far more good than harm is that people who need them to live will be able to afford them. The media has reported on heart-wrenching stories of destitute people who are unable to pay for their prescription drugs. They either do without or take a less-than-optimal dose. The availability of these *free-market generics* will enable virtually anyone to be able to afford their medications.

Those who think generic drugs are safe today should be aware of isolated instances when improperly made active ingredients make it into prescription drugs sold in US pharmacies. These defective ingredients often emanate from FDA-approved manufacturers in China and India. The FDA gives false assurances that these government-approved laboratories are safe. The reality is that the FDA can only inspect each Chinese drug-making factory at best only *once every 13 years*. So the protection consumers think they have today is a facade. I would feel more comfortable buying generics from a company that had its own inspectors in offshore manufacturing facilities as opposed to relying on meaningless FDA rhetoric.

**As this Article Was Being Finalized...**

As this article was being finalized, news broke that the FDA had just granted an exclusive monopoly to a company to sell a non-patented progesterone drug that prevents premature births. Healthy women naturally secrete huge amounts of progesterone during pregnancy that helps maintain their uterine lining. To protect against premature births and miscarriages in women at risk, enlightened doctors have for decades prescribed progesterone medications that were made by state-licensed compounding pharmacies. The cost per injection was around $20.
By granting orphan drug status to one company (KV Pharmaceutical), FDA rules banned all other forms of progesterone for this indication. The immediate impact was that the cost per injection skyrocketed to $1,500—or as much as $30,000 for a full-term pregnancy.59

An uprising over this price gouging forced the FDA to back down and state it "does not intend to take enforcement action against pharmacies that compound hydroxyprogesterone caproate."

What the FDA is saying is that while it has the discretion to arrest compounding pharmacists for making this drug, it does not "intend to" do so. After the FDA made this announcement, KV Pharmaceutical reduced the price to $690 per injection—which is still more than 34 times its previous free market price.

It is unclear how private insurance and Medicaid will determine whether to pay $690 per injection for the version FDA rules state is the only one that can be legally sold or continue paying for the much lower-cost compounded version.

Women who are denied access to this drug because of the regulatory quagmire face increased risks they will deliver pre-term babies. In these cases, the costs for intensive neonatology care can run into the hundreds of thousands of dollars per premature-born baby, a price often borne by Medicaid or private insurance.

No country on earth can afford this kind of institutionalized corruption, where the chosen few pharmaceutical companies favored by the FDA reap extortionist profits as the nation collapses into a financial abyss. This rare instance in which public backlash forced the FDA to back away from protecting a pharmaceutical company’s obscene profit reveals that citizens have the power to save this country from financial Armageddon.

The United States of America faces a health care cost crisis that will render Medicare, Medicaid, and many private insurance plans insolvent. The shocking details about this country’s inability to fund future medical costs are no longer confined to the pages of Life Extension Magazine®. You are reading about them virtually every day in the mainstream media.60,61

When terrorists attacked the United States in 2001, there were patriotic Americans who enlisted in the armed services. Many lost their limbs, their vision, and their lives.

No one has to engage in physical combat to save this country from the institutionalized inefficiencies and corruption that plague today’s disease-care system.
My new book *Pharmocracy* presents irrefutable logic to reform today’s broken health care system. The cover price for each copy of *Pharmocracy* is $24. Life Extension members obtain it at a 60% discount and pay only $9.60.

We are offering four copies of *Pharmocracy* to Life Extension members for only $32 (or $8 each). The reason we want you to purchase four copies is so you can send a copy to your representative and two senators.

We believe if enough citizens send *Pharmocracy* to Congress, that our leaders will be forced to recognize the obvious free-market solutions to today’s broken health care system.

To order one or four copies of *Pharmocracy* today call 1-800-544-4440.

For longer life,

William Faloon

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The reason for many circulatory problems is the breakdown of endothelial function and structure. Today, there are nutrients that have been clinically shown to help maintain healthy endothelial function and arterial circulation. **Endothelial Defense™ with GliSODin®** provides potent nutrients to support endothelial health: **standardized pomegranate** and an orally active form of **superoxide dismutase.**

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The unique blend of pomegranate **flower extract** and seed oil in **Endothelial Defense** contains potent polyphenols that provide support for youthful **lipid** and **glucose** metabolism, natural **immunity**, and help with **inflammatory factors.**

A bottle containing 60 softgels of **Endothelial Defense™ with Full-Spectrum Pomegranate™** retails for $56. If a member buys four bottles, the price is reduced to just $39 per bottle.

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To Order **Endothelial Defense™ with Full-Spectrum Pomegranate™**, call 1-800-544-4440 or visit www.LifeExtension.com
In a startling revelation, medical costs for a family of four will run $19,393 in the year 2011. That’s an increase of $1,319 from 2010 and double what it cost in 2002.

The obvious problem is that typical families cannot afford $19,393 yearly. Neither can their employers, their insurance companies, and certainly not our debt-laden state and federal governments.

There is a free-market solution to today’s artificially inflated health care costs. Congress can amend the law to allow free-market forces to drive down sick-care costs, better enable the prevention of diseases, and facilitate rapid development of improved medical therapies.

A just-released book titled Pharmocracy provides factual documentation to reform the broken health care system that plagues the United States. It is more than 300 pages long because there are at least that many underlying reasons why medicine costs far more than it should.

Until now, no one has identified and amalgamated the plethora of illogical regulations that cause health care to be so overpriced.

While Pharmocracy exposes FDA corruption and ineptitude, Congress is the body of government that provides the FDA with enabling laws that ultimately result in needless suffering and death ... while the nation descends into financial ruin.

Implementing free-market approaches described in Pharmocracy can spare Medicare and Medicaid from insolvency while significantly improving the health and productivity of the American public.

Pharmocracy provides an irrefutable and rational basis to remove the suffocating compulsory aspect of health care regulation. It then documents how the free market can provide superior health care at far lower prices while better protecting consumers.

HOW YOU CAN COMBAT INFLATED HEALTH CARE COSTS

Fight back against institutionalized corruption that is rendering this nation insolvent.

Pharmocracy provides a blueprint as to how motivated citizens can tear down the bureaucratic barriers that push health care costs beyond the financial reach of the typical American.

Pharmocracy is sold at a bookstore near you or can be ordered directly by calling 1-800-544-4440 or visit www.lef.org/pharm.

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The older eyes get, the more susceptible they become to an array of debilitating issues that can hamper eyesight and cripple quality of life. With just a few drops of the proper eye lubricant, eye irritation stemming from dryness may be alleviated. Brite Eyes by Life Extension® provides a powerful dose of two well-established lubricants in every drop, soothing eye discomfort without irritation. Hydroxymethylcellulose and glycerin are FDA-approved for ophthalmic use and are uniquely preserved with potent antioxidants and anti-glycating agents.

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

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

Eye support is essential to preventing age-related vision problems.

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

To order Brite Eyes III, call 1-800-544-4440 or visit www.LifeExtension.com
Creatine May Reduce Side Effects of Statin Drugs

The nutrient most associated with an ability to help reduce the side effects of statin drugs is coenzyme Q10 (CoQ10). Numerous studies support the use of CoQ10 in combination with prescription statin drugs. However, creatine appears to be another nutrient that may be of considerable benefit to those taking statin drugs experiencing any of the classic side effects of statin drugs, such as myalgia, weakness, and lethargy.

A recent study performed at the Johns Hopkins School of Public Health found creatine highly effective for reducing the side effects of the statin drugs. In fact, the researchers theorize one of the effects of the statin drugs may be a decrease in intracellular creatine in muscle, similar to the toxic effects of glucocorticoids and cyclosporine.

This study looked at 12 patients identified as intolerant of several different statin drugs. Amazingly, the study found that creatine loading followed by maintenance creatine therapy totally prevented myopathy symptoms in eight out of 10 patients receiving statins. More telling of the profound effect of the creatine: all patients went on to develop myopathy symptoms while receiving statins alone, which went away after creatine was reintroduced.

Creatine supplementation plus CoQ10 may be the most effective combination yet found for treating or preventing statin drug side effects.

—Will Brink

Soluble Fiber Helps Bust Belly Fat

In a recent article published in Obesity, researchers from Wake Forest Baptist Medical Center report an association between increased intake of soluble fiber and a reduction in visceral or belly fat that surrounds the body’s organs and is considered the most dangerous type of adipose tissue. “We know that a higher rate of visceral fat is associated with high blood pressure, diabetes, and fatty liver disease,” explained lead researcher Kristen Hairston, MD.

Dr. Hairston and her colleagues evaluated data from 1,114 participants in the Insulin Resistance and Atherosclerosis Family Study. Physical examinations were conducted, and visceral and subcutaneous fat was measured via computed tomography upon enrollment and after five years. Dietary intake over the previous year was reported during the five-year follow-up visit.

Although consuming more soluble fiber was not associated with the accumulation of less subcutaneous fat, an association with decreased visceral fat accumulation over time was observed.

Editor’s note: Dr. Hairston plans to conduct a clinical trial later this year to test whether consuming a soluble fiber supplement elicits a similar benefit as that suggested by the current research. Examples of soluble fiber sources are propomannan, oat bran, flaxseed, beans, and apples.

—D. Dye


* Obesity. 2011 Jun 16.
Review Finds Improved Survival in Trials of Vitamin D3 Supplementation

A lengthy review published in *The Cochrane Library* reveals that supplementing older individuals with vitamin D3 is associated with reduced mortality over a two-year period.*

Goran Bjelakovic of the University of Nis in Serbia and his European associates selected 50 randomized trials involving vitamin D supplementation, which provided a total of 94,148 participants for their analysis. The median length of supplementation with vitamin D was two years.

Dr. Bjelakovic and his colleagues uncovered a significant benefit for supplementation with vitamin D3, but not for other forms of the vitamin, on improving survival over the course of the trials. “Our analyses suggest that vitamin D3 reduces mortality by about 6%,” he concluded. “This means that you need to give about 200 people vitamin D3 for around two years to save one additional life.”

Editor’s note: Because there were fewer trials involving other forms of vitamin D included in the current analysis, the apparent absence of a survival benefit for these forms needs to be taken with caution. The dose of vitamin D3 used in these trials was far less than the 5,000 IU to 10,000 IU most Life Extension members use today.

—D. Dye


Flavonoid Prevents Diabetic Complications

Recently, the journal *PLoS ONE* reported the discovery by Salk Institute for Biological Studies researchers of a benefit for fisetin in the prevention of several complications that can result from diabetes.* Fisetin is a flavone found in abundance in strawberries, and smaller quantities in other fruit and vegetables.

Salk Institute Cellular Neurobiology Laboratory head David Schubert, PhD, and his associates evaluated the effects of fisetin in healthy control mice and Akita mice bred to develop type 1 diabetes. The latter developed kidney disease, retinopathy, and neuropathies typical of human type 1 diabetics.

Although the diabetes in animals that received fisetin remained, kidney enlargement and urinary protein decreased compared to diabetic mice that did not receive the compound. Anxiety-related symptoms, which are a central nervous system complication that occurs in many human diabetics, were also reduced in animals that were given fisetin.

Editor’s note: Dr. Schubert remarked, “We will never know if a compound like fisetin works in humans until someone is willing to support a clinical trial.”

—D. Dye


Studies Show How Tocotrienols Reduce Stroke Damage

Reports published online in the *Journal of Cerebral Blood Flow & Metabolism* and in the journal *Stroke* reveal the findings Chandan K. Sen and his associates discovered of protective effects for tocotrienols against the damage incurred by stroke.

In the first article, Dr. Sen and colleagues reported the effect of tocotrienols in a canine model of stroke. Animals that received tocotrienols experienced less overall brain damage, decreased loss of neural connections and better blood flow to the affected area (from collateral vessels) compared with those that did not receive the compounds.*

In the *Stroke* article, Dr. Sen and coauthors describe experiments with alpha-tocotrienol that uncovered one of three mechanisms by which the compound helps prevent the death of brain cells following stroke. The current research demonstrated that tocotrienol activates genes that produce multidrug resistance-associated protein 1 (MRP1), a protein that clears away intracellular oxidized glutathione, which accumulates during stroke and triggers brain cell death.*

Editor’s note: Alpha-, beta-, gamma-, and delta-tocotrienols are four of the eight forms in which vitamin E occurs and, while not abundant in Western diets, are available in supplemental form.

—D. Dye


**IN THE NEWS**

**Vitamin D Insufficiency Associated with Football Injuries**

The American Orthopaedic Society for Sports Medicine’s Annual Meeting held in San Diego was the site of a presentation by Michael Shindle, MD, and his colleagues showing a higher incidence of vitamin D insufficiency among National Football League players with muscle injuries.*

The current study included 89 NFL players aged 21 to 32 years. Vitamin D deficiency was identified in 27 participants, and insufficient levels were observed in 45 subjects. Caucasian players had an average level of 30.3 nanograms per milliliter, while African Americans averaged 20.4 nanograms per milliliter. Among those with muscle injury, vitamin D levels averaged 19.9 nanograms per milliliter, which is considered deficient.

Co-author Joseph Lane, MD, of the Hospital for Special Surgery concluded that, “Further research also needs to be conducted in order to determine if increasing vitamin D leads to improved maximum muscle function.”


**Editor’s note:** Scott A. Rodeo, MD, who is co-chief of the Sports Medicine and Shoulder Service at the Hospital for Special Surgery, added that, “Screening and treatment of vitamin D insufficiency in professional athletes may be a simple way to help prevent injuries.”

—D. Dye

**Higher Vitamin D Levels Improve Osteoporosis Drug Response**

The Endocrine Society’s 93rd Annual Meeting was the site of a presentation of the finding of Richard Bockman, PhD, and his associates of a better response to treatment with bisphosphonate drugs among women whose vitamin D levels were higher than the range of 20 to 30 nanograms per milliliter considered adequate by the Institute of Medicine.*

The current study included 160 women with osteoporosis who had been using bisphosphonates for 18 months or more and who had received at least two bone mineral density scans separated by up to 5 years. Eighty-nine of the participants were classified as responders to bisphosphonates, and 71 were nonresponders.

Bisphosphonate responders were seven times likelier than nonresponders to have a 25-hydroxyvitamin D level of 33 nanograms per milliliter or higher. “If you want to see a particular outcome from this treatment, then maybe 20 to 30 is not appropriate,” Dr. Bockman stated.


**Omega-3 Supplementation Soothes Anxiety, Inflammation**

In an article published in *Brain, Behavior and Immunity*, researchers at Ohio State University College of Medicine report that supplemental omega-3 fatty acids from fish oil lower anxiety as well as the stress-associated increase in pro-inflammatory molecules known as cytokines in healthy young adults without anxiety disorders.*

Janice Kiecolt-Glaser and her colleagues divided 68 first- and second-year medical students, who experience significant levels of stress, to receive omega-3 fatty acids or a placebo. Those who received omega-3s had a 20% reduction in anxiety compared to those who received the placebo, as well as lower amounts of pro-inflammatory cytokines.

“We saw a 14% reduction in the amounts of interleukin-6 among the students receiving the omega-3,” stated Ohio State professor of molecular virology, immunology, and medical genetics Ron Glaser, PhD. “Anything we can do to reduce cytokines is a big plus in dealing with the overall health of people at risk for many diseases,” he added.

*  *Brain Behav Immun.* 2011 Jul 19.
IN THE NEWS

Broccoli Compound Goes After Cancer Cells

A study reported in *Molecular Nutrition & Food Research* shows that sulforaphane, a compound that occurs in cruciferous vegetables including broccoli, targets cancer cells by inhibiting a family of enzymes known as histone deacetylases while leaving healthy cells alone. Histone deacetylase inhibitors help turn on tumor suppressor genes that are silenced in cancer cells, restoring normal function.

Emily Ho and her colleagues studied the effects of sulforaphane in normal, benign hyperplastic and prostate cancer epithelial cells. They found that the compound induced cell cycle arrest and programmed cell death in prostate hyperplasia and cancer cells, while not affecting normal cells.

“It is well documented that sulforaphane can target cancer cells through multiple chemopreventive mechanisms,” the authors write.

“Here we show for the first time that sulforaphane selectively targets benign hyperplasia cells and cancerous prostate cells while leaving the normal prostate cells unaffected,” they announce.

Editor’s note: Oregon State University researchers had previously found that giving mice a high-sulforaphane diet retarded prostate tumor growth.

—D. Dye


Movie Premiere: Transcendent Man with Ray Kurzweil

TRANSCEIDENT MAN chronicles the life and ideas of Ray Kurzweil, an inventor and futurist who presents his bold vision of the Singularity, a point in the near future when technology will be changing so rapidly that we will have to enhance ourselves with artificial intelligence to keep up. Ray predicts this will be the dawning of a new civilization in which we will no longer be dependent on our physical bodies, we will be trillions of times more intelligent, and there will be no clear distinction between human and machine, real reality and virtual reality.

Ray predicts that human aging and illness will be reversed, world hunger and poverty will be solved, and we will ultimately cure death. Critics accuse Ray of being too optimistic and argue that the dangers of the Singularity far outweigh the benefits, pointing out the apocalyptic implications that once machines achieve consciousness, we may not be able to control them. Whether Ray’s controversial ideas incite excitement or fear, dogma or disbelief, this ambitious documentary will forever change the way you look at life, death, and your own future.

For more information, visit: http://transcendentman.com/

—Felicia Ptolemy and Celia Black
ANTI-AGING PRACTICE IN INDONESIA

PERPASTI (Indonesian Society of Anti-Aging Physicians) is the first and biggest medical society of anti-aging practitioners in Indonesia.

It was officially announced on September 3, 2006, in Jakarta by the Minister of Health of the Republic of Indonesia. Although it is a young organization, the founders were very keen to absorb the knowledge and practice anti-aging medicine for themselves and their patients. Furthermore, a series of seminars, symposia, and workshops were held in Jakarta and other cities in Indonesia (which is home to more than 220 million people). Almost 700 doctors attended these seminars, including specialists of all kinds and general practitioners. This speaks to the broader appeal of the organization, which among its founders comprises dermatologists, lung specialists, pharmacologists, pathologists, naturopathic and homeopathic doctors, estheticians, advanced hormone therapists, epidemiologists, and physical exercise specialists.

Topics that were brought forward included obesity, stress reduction, esthetics/cosmetics, growth hormone, integrative cancer therapy, improving quality of life, and growing older without aging.

The desire to disseminate the science and skill of teaching wellness and anti-aging medicine has prompted chapters of PERPASTI to open up in cities throughout Indonesia.

The upcoming Congress in September-October 2011 will bring forward the latest developments in this medical specialty.

For registration information, call 021-3915158 or visit www.perpasti.com.
Mitochondrial Energy Optimizer with BioPQQ™ is designed to counteract age-related structural and functional changes by providing the following unique ingredients:

- **CARnosine** As humans age, proteins in their bodies become **irreversibly damaged** by **glycation** reactions. Glycation is the cross-linking of proteins and sugar to form non-functioning structures (Advanced Glycation End Products or “AGEs”) in the body, which can lead to alterations of normal cell function. **Carnosine** is not only a powerful **anti-glycating** agent, but it also protects **neurons** against reactive and cytotoxic protein carbonyl species associated with normal aging.\(^3\)\(^4\)

- **PYRIDOXAL 5'-PHOSPHATE** This breakthrough micronutrient has recently been shown to trigger **mitochondrial biogenesis**—the growth of new mitochondria in aging cells.\(^5\)\(^6\) PQQ also activates genes involved in protecting the delicate structures within the mitochondria.\(^7\)\(^8\)

- **LUTEOLIN** Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind **chronic inflammatory** reactions are pro-inflammatory **cytokines**, such as **Interleukin-1** and **tumor necrosis factor alpha**. Luteolin is a super-potent plant extract that has been shown to modulate these dangerous inflammatory cytokines.\(^9\)\(^10\)

- **BENEFOTIAMINE** Effectively modulates multiple destructive biochemical pathways, including AGEs’ formation pathway, which are induced by higher than ideal fasting glucose levels. Human mortality studies indicate that ideal fasting glucose levels are between 74–85 mg/dL. Yet many aging people have fasting glucose above 90 mg/dL, which is less than optimal.\(^16\)\(^17\) Benfotiamine protects endothelial cell integrity from the effects of high glucose levels. In addition, benfotiamine exhibits direct antioxidative capacity and prevents induction of DNA damage.\(^20\)

- **PYRIDOXAL 5’-PHOSPHATE** Aging results in the formation of advanced glycation end-products throughout the body. **Pyridoxal 5’-phosphate** is the active form of vitamin B6 that has been shown to protect against both lipid and protein glycation reactions.\(^21\)\(^24\)

- **R-LIPOIC ACID** Destructive free-radical activity in the mitochondria plays a major role in the loss of cellular vitality. A microencapsulated Bio-Enhanced R-lipoic acid facilitates youthful mitochondrial energy output while guarding against free radicals. Two forms of lipoic acid are sold on the supplement market, but R-lipoic acid is far more potent.\(^25\)\(^28\)

- **ACETYL-L-CARNITINE ARGINATE** The amino acid L-carnitine is required to transport fats into the mitochondria to be burned for cellular energy. Acetyl-L-carnitine arginate is a patented form of carnitine that also supports neurites in the brain.\(^29\)

Taking all of the individual ingredients in the Mitochondrial Energy Optimizer with BioPQQ™ separately would be prohibitively expensive, but Life Extension® members obtain this comprehensive formula at substantial savings.

A bottle of Mitochondrial Energy Optimizer with BioPQQ™ containing 120 capsules retails for $94. If a member buys four bottles, the price is reduced to $63 per bottle. Contains soybeans.

### Just four capsules of Mitochondrial Energy Optimizer with BioPQQ™ provide:

- **Carnosine** 1000 mg
- **ArginoCarn® Acetyl-L-carnitine arginate DIHCl** 675 mg
- **Bio-Enhanced® R-Lipoic acid (microencapsulated)** 150 mg
- **Benfotiamine** 150 mg
- **Pyridoxal 5’-Phosphate** 100 mg
- **BioPQQ™** 10 mg
- **Luteolin** 8 mg

To order Mitochondrial Energy Optimizer with BioPQQ™, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com).
Life Extension® first introduced SAMe in 1997. Since then, researchers continue to discover impressive benefits of this versatile nutrient. Largely known for its effects on optimal mood, SAMe has also shown benefits for the liver, brain, and joints.

A recent study conducted at Harvard Medical School and Massachusetts General Hospital cited the impressive benefits of SAMe for mood elevation.1

A report published in Germany indicates that SAMe may help maintain healthy neurological function.2 The impressive results showed that:

- SAMe increased glutathione levels by 50% and glutathione enzyme activity by 115%.2
- SAMe decreased a measurement of free radical activity by 46%.
- SAMe inhibited lipid peroxidation by 55% in culture.2

In addition to these findings, SAMe also improves brain cell methylation, thereby facilitating youthful DNA enzymatic actions (which may help account for SAMe's mood elevating properties). These enzymatic reactions are required for the healthy conversion of neurotransmitters such as serotonin and dopamine.

The good news is that SAMe prices continue to plummet. Compared to when SAMe was first introduced to the United States in 1997, Life Extension members can now obtain it for 78% less. On an inflation-adjusted basis, the savings are even greater.

A box of 20 400 mg SAMe tablets retails for $32. When a member buys six boxes, the price is reduced to only $18.75 a box—a savings of 40%!

(SAME is also available in bottles containing 50 400 mg tablets. Retail price is $72. If a member buys four bottles, the price is reduced to $49.50 per bottle.) (Item #01055)

References

To order your supply of premium-grade SAMe, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: SAMe should not be taken by those diagnosed with bipolar disorder.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
SLASH YOUR RISK for Premature Death with OMEGA-3s

For years, consumers have been learning of the benefits of reducing cardiovascular disease by ingesting omega-3 fatty acids. This message has made its way into the mainstream as cardiologists now prescribe omega-3 supplements to their patients.¹

Far beyond the benefits of heart disease reduction, scientists have discovered startling new data that omega-3 fatty acids slash the overall risk of an early death.¹⁻⁴ That reduction is seen not only in people with known chronic diseases but even in those who are apparently healthy. Published studies show that you can reduce your risk of dying prematurely by as much as 85% by maintaining optimal levels of omega-3 fats in your body.⁵

By Delia Wilder

October 2011 | Life Extension | 29
A wealth of published studies has demonstrated a significant reduction in mortality with the use of fish oils. In one such report, scientists studying people who had lived through a heart attack were shocked to find that patients with the highest levels of omega-3s in their blood were prevented from dying of any cause, not just heart-related conditions. In a similar study, people who had heart attacks were found to have a much lower likelihood of a dangerous cardiac arrhythmia called atrial fibrillation if they had high omega-3 levels—and had an incredible 85% lower risk of dying from all causes in addition.

Intrigued, scientists began looking at healthy people with no evident heart disease. Would the protection apply to those people as well? The answer is yes. When a large group of Norwegian men 64-76 years of age were supplemented with 2.4 g/day of omega-3s, they had a 47% reduction in risk of dying from all causes compared with a placebo group. Women can achieve similar levels of protection: a massive Australian dietary intake study found that women with the highest omega-3 consumption had a 44% reduction in risk of mortality from inflammatory diseases. The effect was dose-related: for each standard-deviation increase in omega-3 intake, women achieved a 17% reduction in their risk of dying.

What explains this remarkable and consistent reduction in “all-cause mortality?” There are many factors at work, but one of the most important is related to the ways in which your dietary fat intake affects your body’s inflammatory status. A high intake of omega-3s (from cold-water fish, from flax seed oil, and from fish oil supplements) can push your body from a dangerous pro-inflammatory condition to a healthier, lower-inflammation state. And that has direct impact on your chances of living longer.

**Omega-3 Fats and Inflammation:**
Steps Toward a Longer Life

The typical Western diet now contains a vast excess of omega-6 fats (largely derived from poultry products and certain vegetable oils). Other animal products are rich in saturated fats, not omega-6 fats and not nearly enough omega-3s (which we get from ocean fish and plant foods such as nuts and flax seeds).

The optimum ratio of omega-6 to omega-3 fats in the diet is roughly 4 to 1, though some proponents claim the ratio should be two omega-6s for each one omega-3. Shockingly, those who follow unhealthy modern Western diets often consume these fats in ratios as high as 25 (omega-6) to only 1 (omega-3). The resulting increase in inflammatory cytokines creates chronic, low-grade inflammation that directly exacerbates aging and may contribute to early death from myriad chronic conditions. In other words, inflammation is aging at a very fundamental level.

That’s why high consumption of omega-3s, particularly EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) found in fish oil has such a dramatic impact on your risk of dying. By nudging your omega-6 to omega-3 ratio back toward the optimum, you can significantly reduce your body’s inflammatory load.
You should do that by reducing your intake of saturated fat (from meat and dairy), reducing omega-6s (from poultry and certain vegetable oils), and increasing your intake of omega-3s (from fish, fish oil, and flax seed oil). By supplementing with omega-3s, you can increase your chances of living longer and better, by cutting your risk of a host of age-related, longevity-stealing chronic conditions that originate with inflammation. The evidence is detailed and compelling.

**Omega-3s Combat Stress and Cortisol Damage**

_**Chronic stress**_ and the resulting elevation in stress hormones (cortisol, epinephrine, norepinephrine) accelerate aging.\(^{15}\) They are _major contributors to premature death_ from a variety of causes, mostly related to increased risk of chronic cardiovascular, infectious, and metabolic disorders.\(^{15-17}\) There’s also evidence that chronic stress itself lowers your blood levels of omega-3s.\(^{18}\)

Supplemental omega-3s can inhibit the excessive adrenal gland stimulation that triggers stress effects.\(^{19,20}\) Studies of healthy adults subjected to biological and emotional stress demonstrate that omega-3 supplementation from fish oil prevents cortisol, epinephrine, and norepinephrine elevations.\(^{20-23}\) Plant-derived omega-3 supplements in animal studies not only blocked cortisol elevations, but countered stress-induced learning deficits.\(^{24}\)

**Omega-3s Battle Depression, Anxiety**

Victims of chronic mental illness, particularly _depression and anxiety_, have a shockingly high _rate of premature death_ from “natural causes.”\(^ {25,26}\) These illnesses can cost men nearly 15 years of life expectancy and women nearly 18 years.\(^ {27}\) Depression, the most common mental illness, affects more than 5% of the US population during any given 2-week period, and is strongly correlated with dying early.\(^ {28}\)

Scientific discoveries in the past decade demonstrate roles for omega-3s in the management of mental illness, especially depression and anxiety. Omega-3s are _essential_ components of brain cell membranes and may help increase nerve cell transmission of signals with serotonin, levels of which can be abnormal in depression.\(^ {29,30}\) Their anti-inflammatory effects also show promise in preventing depression-related loss of brain cells.\(^ {31}\)

People with major depressive disorder and bipolar disorder have low brain levels of omega-3s.\(^ {32,33}\) Those low levels are closely associated with worsening depression and even predict an increased risk of

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**Slash Your Risk for Premature Death with Omega-3s**

- Omega-3 fatty acids have a well-established role in preventing cardiovascular disease and death.
- Recent studies are revealing a role for these beneficial fats in reducing your risk of premature death from numerous causes.
- By reducing your total body level of inflammation, omega-3s can slash the risk of many conditions that cause us to die early.
- Keeping your omega-3 levels high, and your omega-6 levels low, can help prevent the metabolic syndrome, symptoms of depression and anxiety, a variety of forms of cancer, and many forms of liver and kidney diseases, all of which are associated with premature death.
- Omega-3s also contribute to reducing the deadly effects of chronic stress and high cortisol levels.
- If you aren’t supplementing with at least 2 grams/day of a high-quality omega-3 product, you may be unnecessarily courting an early death.
suicide. Conversely, higher dietary intake of omega-3s is associated with as much as a 34% reduction in risk of symptomatic depression, compared with people having the lowest rate of consumption.33

Omega-3 supplementation has by now become much more accepted because of its dramatic effectiveness in managing depression. Studies show that daily doses of 1 gram or more of EPA and DHA significantly reduce scores on standard depression rating scales, especially in older adults.36–38

Anxiety can be a crippling short-term problem that also contributes directly to premature death; one study found a 77% increase in mortality risk among anxious women at midlife.39–41 Omega-3 supplementation may be important in managing symptoms of anxiety as well as depression. An omega-3-rich mixture of essential fatty acids lowered test anxiety in one early human study.40 Later studies demonstrated reduction of anxious feelings in populations of substance abusers treated with 3 grams/day of EPA plus DHA.42

Omega-3s: Powerful Weapons against Metabolic Syndrome

The metabolic syndrome is a clustering of risk factors including abdominal obesity, elevated fasting glucose (also called insulin resistance or “pre-diabetes”), hypertension, elevated triglycerides, and lowered high-density lipoprotein (HDL). This syndrome contributes to disease risk that may increase the chances of an early death from multiples causes.43–47

Epidemiological evidence suggests that people with low levels of omega-3s in their blood have as much as a 2.4-fold higher risk of having metabolic syndrome.52 On the other hand, people with the highest intakes of omega-3s have as much as a 46% lower risk of metabolic syndrome.59,50

Supplementation with omega-3s at doses ranging from 1-3.7 grams per day has now been shown to improve all 5 parameters of the metabolic syndrome:

- Treatment with omega-3s has an anti-obesity effect.51 It reduces total fat mass, abdominal fat mass, the size of individual fat cells, and raises levels of the beneficial cytokine adiponectin.52,53
- Higher plasma omega-3 levels correlate with improved insulin sensitivity and glucose tolerance.50,54 Supplementation both prevents and reverses insulin resistance, especially in the face of a high-fat diet.55,56
- Average doses of 3.7 grams/day of fish oil reduce both systolic and diastolic blood pressure.57 Additional studies with doses as low as 1 gram/day also showed decreases in systolic blood pressure.58
- Omega-3 supplementation dramatically lowers triglycerides and other risk factors for atherosclerosis.52,58–60 One gram per day of fish oil was shown to normalize triglyceride levels in elderly people and protect them from rising levels.61
- Higher omega-3 plasma levels are correlated with higher HDL levels.50 Supplementation with omega-3s resulted in a reduction in the ratio of triglycerides to HDL level, a beneficial change.52

Omega-3s Fight Cancer at Its Earliest Stages

Cancers of all kinds are common causes of untimely death. Diet has long been known to be an important factor in the development of many kinds of cancer. The Mediterranean dietary pattern, abundant in vegetables, fruits, and omega-3-rich fish, is associated with low cancer rates.62 One study comparing the Mediterranean diet with an American Heart Association-recommended diet found a 56% reduction in risk of developing cancer and a 61% reduction in risk of dying from cancer.62 The Mediterranean diet group’s intake of omega-3 fats was also significantly higher than in the control group.

Cancers of the digestive tract are common and also the most susceptible to prevention with omega-3 fats.
These cancers have a strong inflammatory compon-
ent, which may explain at least part of the benefits of
omega-3 fatty acids. Laboratory and human clinical
studies demonstrate that omega-3 treatment causes
decreased proliferation and increased cell death
(apoptosis) of cancer-prone colon cells, while healthy
tissue is unaffected. Effective doses range from 2.5
to 7.7 grams/day of fish oil. Two grams/day of EPA
alone can reduce the number of precancerous rectal
polyps in patients at high risk for colorectal cancer.

Inflammation also plays a major role in skin cancer
development following exposure to ultraviolet (UV)
rays from the sun. Not surprisingly, studies show
that omega-3s have a role in protecting skin cells
from the cancer-causing effects of the sun. Four
grams per day of purified omega-3s protected a group
of healthy subjects from sunburn, UV-induced precancerous changes in skin, and DNA damage in circulat-
ing blood cells.

Cancers of the breast and prostate are also respons-
ive to omega-3 prevention. Men with the highest
blood levels of EPA and DHA have a 38-41% reduced
risk of prostate cancer, compared with those having
the lowest levels. Treatment with omega-3s reduced
the rate at which prostate cancers progress to the
dangerous state of independence from hormonal con-
trol; that progression is typically the harbinger of an
untreatable cancer and early death.

In a group of premenopausal women at high risk
of breast cancer, those consuming the highest ratio of
omega-3:omega-6 fats had a 50% reduction in their
risk of developing cancer. Women who had been
diagnosed and treated for early breast cancer, and
whose diet contained the largest amount of omega-
3s, had a 25% reduction in the risk of cancer recur-
cence. High-risk women who supplemented with
2.5-7.6 grams/day of DHA/EPA achieved excellent
levels of these omega-3s in their breast tissue and had
no side effects.

Omega-3s: Vital Protection
for Kidney and Liver Function

Kidney disease kills more than 46,000 Americans
annually and is the ninth leading cause of death in
the US; roughly 4.5 million of us suffer from kidney
disease of one form or another. Although there are
many different types of kidney disease, most of them
share a significant oxidative and inflammatory com-
ponent that can be helped by high levels of omega-
3s. In one large study, people consuming the
highest amounts of omega-3s had a 31% reduction
in their risk of developing chronic kidney disease.
And kidney transplant recipients with higher levels of
omega-3s in their blood had significantly lower risk of
transplant rejection than did those with lower levels.

Kidney disease (and its treatment) imposes mas-
sive metabolic and oxidative stress on the victim’s
body, accounting in part for a high mortality rate.
Dialysis patients taking EPA/DHA 1.8 grams/day expe-
rienced significantly lower levels of harmful adrenal
stimulation compared with controls, and 3.4
grams/day dropped their triglyceride levels signifi-
cantly, thereby lowering their heart attack risk.
Two grams/day of EPA/DHA significantly reduced markers of inflammation in patients with end-stage renal disease, while 2.1 grams/day of fish oil reduced markers of oxidative stress.83,84 A dose of 4 grams/day of fish oil substantially improved renal function in diabetic patients, a group at major risk of early death from kidney disease.85

Non-alcoholic fatty liver disease (NAFLD) affects up to 35% of the world’s population. Its dangerous consequence called non-alcoholic steatohepatitis (NASH) may lead to cirrhosis of the liver, a cause of premature death in the United States.86-88 The massive liver accumulation of triglycerides in NAFLD is also strongly associated with diabetes and cardiovascular disease, further reducing longevity.89 Mainstream medicine has proved impotent to date at slowing the progression of NAFLD to NASH, or at reducing its potentially deadly consequences.90

As with all of the other causes of early death, a high intake of omega-3s is strongly preventive of NAFLD: men with the greatest consumption of EPA/DHA had a 52-56% reduction in their risk of having the condition.89 Supplementation with omega-3s provides impressive protection and treatment for people with NAFLD. Studies show that doses of 1 gram/day and more result in marked improvements in serum markers of liver cell damage, reductions of circulating triglycerides, and visible improvement in liver texture and blood flow on Doppler ultrasound tests.91-93

Summary

Americans die too young, despite the highest expenditures on prescription drugs in the world.94 We succumb to a host of chronic conditions typically labeled “age-related,” though aging is not the only inducing factor. Instead, we are falling victim to persistent inflammatory changes brought on in large part by poor dietary choices.

Compelling studies demonstrate that people with high omega-3 intakes live longer. We now have a clear understanding of why: they have lower rates of virtually every one of the “age-related” conditions that hasten death.

You should consume at least two grams (2,000 milligrams) of EPA/DHA daily to emulate studies showing reduction in risk of early death.

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

Still More Ways Omega-3s Can Keep You From Dying Too Early

There’s compelling evidence that omega-3s play a role in some less-than-obvious causes of early death. For example, osteoporosis, which affects more than 4.5 million American women and an additional 800,000 men,95 causes fractures that are major contributors to premature death, often ending an otherwise productive life in a prolonged and painful fashion.96-98 Keeping omega-3 levels optimum may help to prevent osteoporotic fractures and thus reduce your risk of early death.95-105

Chronic lung diseases such as asthma and COPD (chronic obstructive pulmonary disease) also significantly shorten life span.106 Again, there’s a wealth of evidence supporting a role for omega-3s in mitigating the inflammatory state that triggers these conditions and contributes to early death.106-116

Given the role of inflammation in the aging process, it just makes sense to ensure that our omega-3 levels are as high as possible.
SLASH YOUR RISK FOR PREMATURE DEATH WITH OMEGA-3s

Overall death from cardiac causes
20-29% fewer deaths in supplemented patients1,2

Risk of sudden cardiac death
13-57% lower risk in patients supplemented with 1.8 g/day EPA/DHA2,3

Risk of non-fatal cardiac events
8% lower risk in patients supplemented with 1.8 g/day EPA/DHA3

Risk of hospitalization for cardiac arrhythmia (atrial fibrillation)
81% lower risk in supplemented patients5

Risk of depression, anxiety, or stress
28-35% lower risk in those with highest intake117

“TRADITIONAL” RISK REDUCTION BY OMEGA-3 INTAKE

<table>
<thead>
<tr>
<th>Condition</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
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<td>Overall death from cardiac causes</td>
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REVERSAL OF ALL-CAUSE MORTALITY BY OMEGA-3 INTAKE

<table>
<thead>
<tr>
<th>Study Population</th>
<th>Reduction in All-Cause Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart attack survivors</td>
<td>71-85% reduction in supplemented patients or those with highest omega-3 levels5,6</td>
</tr>
<tr>
<td>Patients with stable coronary heart disease</td>
<td>27% reduction in supplemented patients or those with highest omega-3 levels118</td>
</tr>
<tr>
<td>Breast cancer survivors</td>
<td>41% reduction in those with highest EPA and DHA intake74</td>
</tr>
<tr>
<td>Hemodialysis patients</td>
<td>57% reduction in those with highest DHA levels119</td>
</tr>
<tr>
<td>Healthy women ≥ 49 years old</td>
<td>44% reduction in inflammatory disease mortality in those with highest omega-3 intake4</td>
</tr>
<tr>
<td>Men without overt cardiovascular disease</td>
<td>47% reduction in patients supplemented with 2.4 g/day omega-37</td>
</tr>
</tbody>
</table>
References


57. Friedman AN. Omega-3 fatty acid supplements in women at high risk of breast cancer have dose-dependent effects on breast adipose tissue fatty acid composition. *Am J Clin Nutr.* 2010 May;91(5):1185-94.


Ultra Natural Prostate Formula combines eleven cutting-edge natural ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.* One of the newest additions to the formula is European pumpkin seed oil extract, which is rich in delta-7 sterols and fatty acids.

The formula provides saw palmetto extract and Graminex Flower Pollen Extract™ to interfere with DHT activity and help regulate inflammatory reactions in the prostate.* Lycopene is a carotenoid that has been added to the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, Ultra Natural Prostate Formula incorporates HMRLignan™, derived from Norway spruce, flax lignans, and nettle root extract.

Since normal aging can lead to potentially unsafe levels of prostaglandins in the prostate, Pygeum africanum extract is included to help suppress prostaglandins and thereby promote prostate comfort.* Beta-sitosterol has been added because it is the most biologically active component of pygeum and enhances its protective effects.

Ultra Natural Prostate Formula also contains 5-LOXIN® boswellia extract to protect against the dangerous enzyme 5-lipoxygenase and the mineral boron to help slow elevation of prostate-specific antigen (PSA).

The retail price for one bottle of Ultra Natural Prostate Formula is $38. If a member buys four bottles, the price is reduced to $26.25 per bottle. If a member buys 12 bottles, the price is reduced to $24 per bottle.

Contains soybeans and corn.

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

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Health-conscious individuals know the vital importance of the omega-3s found in fish oil for heart health and brain support. Over 14,000 scientific studies in the past 35 years confirm the benefits of the omega-3 fatty acids EPA and DHA at any stage in life.

Yet many young people aren’t getting enough. Omega-3 Chewables offer a low-dose way to augment their current nutritional regimen.

**Cutting-Edge Delivery System**

Omega-3 Chewables feature a state-of-the-art micro-encapsulation technology. This “double-shell” protection system keeps the fish oil locked into tiny capsules contained in each soft chew. They pass intact into your gastrointestinal tract, where they’re broken down and absorbed.

No fishy taste, no aftertaste.

**Molecularly Distilled, Lab Tested**

Sourced from small-species fish harvested in pristine waters off the coast of South America, the fish oil in Omega-3 Chewables is thoroughly tested for safety and purity. It conforms to global health standards, including those established by the European Union, Health Canada, and the Food and Drug Administration (FDA).

**A Convenient Way to Eat Your Omega-3s**

Each Omega-3 Chewable supplies 120 mg of EPA and DHA fatty acids. It’s a nice way to help children (and some adults) increase their omega-3 intake.

Most adults will continue to rely on Super Omega-3 with Sesame Lignans and Olive Fruit Extract softgel capsules to meet optimal potencies.

A re-sealable pouch containing 60 individually wrapped soft chews retails for $24. If a member buys 4 pouches, the price is reduced to only $16.50 per pouch.

Contains fish (anchovy, sardine).

Contains corn and rice.

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

**Caution:** If you are taking anti-coagulant or anti-platelet medications, consult with your healthcare provider before taking this product.

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

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
There’s no debating the power of omega-3 fatty acids. From support for heart health and brain function to help with inflammation, their broad-spectrum benefits have been firmly established in a wealth of studies.1-9

To ensure the purest, most stable, easy-to-tolerate fish oil supplement, Life Extension® SUPER OMEGA-3 EPA/DHA is molecularly distilled. This patented process ensures any pollutants are reduced to virtually undetectable levels. The result? Our fish oil enjoys a 5-star rating for purity, quality, and concentration from the International Fish Oil Standards program (IFOS)—the highest possible rating from the world’s premier testing laboratory.

Sesame Lignans and Standardized Olive Fruit Extract for Enhanced Benefits

Fish oils (and other fatty acids) have a tendency to oxidize, rendering them nutritionally inferior. Scientific studies show that when added to fish oil, sesame lignans safeguard against oxidation and direct fatty acids toward pathways that help with inflammatory reactions.70

To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers standardized, high-potency olive fruit extract. Research shows that when combined with olive oil, fish oil supplements help with inflammation better than fish oil alone.17

Olive also contains the compounds hydroxytyrosol, tyrosol, and oleuropein. Together these nutrients counter the action of free radicals, delay aging in specialized skin cells, prevent undesirable LDL oxidation, and help maintain normal platelet activation.72-15

Super Omega-3 supplies the equivalent content of 6 ounces of extra virgin olive oil. Take two softgels twice daily with meals.

A bottle containing 120 softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $32. If a member buys four bottles, the price is reduced to just $21 per bottle. If 10 bottles are purchased, the cost is just $18.68 per bottle. Item #01482

References:

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

IFOS™ certification mark is a registered trademark of Nutraceutical Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutraceutical Diagnostics, Inc.

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

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

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Contains fish (anchovy, mackerel), soybeans, and sesame. These products are not intended to diagnose, treat, cure or prevent any disease.
THE SILENT EPIDEMIC OF IODINE DEFICIENCY
In 2008, researchers concerned about the growing threat of iodine deficiency analyzed 88 samples of iodized table salt—the main supply of this critical micronutrient for most people. Less than half of those tested contained amounts of iodine sufficient for optimal health.

Coupled with the trend of reduced salt consumption, rates of iodine deficiency are now reaching epidemic levels.

In the developed world, iodine deficiency has increased more than fourfold over the past 40 years. Nearly 74% of normal, “healthy” adults may no longer consume enough iodine.

In this article, the latest data on this dangerous trend are presented. You will learn of iodine deficiency’s profound impact on overall health. You will discover iodine’s vital role in thyroid function and its link to obesity, cognitive impairment, heart disease, psychiatric disorders, and various forms of cancer. You will also find out how iodine can help ward off breast cancer and fibrocystic breast disease.
The health benefits of reducing salt intake have been well established.\(^9,12,13\) Millions of Americans are slashing their use of salt to protect themselves against high blood pressure and cardiovascular disease. But by cutting our salt intake we are also cutting our iodine intake, which is why mean urinary iodine levels (a measure of iodine sufficiency) plummeted by more than half over a 20-year period.\(^4,14\) Additional, otherwise healthy behaviors have also contributed to inadequate iodine intake. (See Table 1 on page 46.)

The danger of low dietary iodine is further compounded by your body’s decreased ability to utilize it, the result of contamination by a ubiquitous environmental toxin called perchlorate. Originally developed for explosives and rocket fuel,\(^18\) perchlorate now pervades ground water and food supplies throughout the US. It’s even used as a flavor-enhancer in certain foods.\(^19-21\) Perchlorate blocks the thyroid gland’s ability to absorb and utilize dietary iodine, an effect that is of concern when iodine intake drops off.\(^18,22\)

The US recommended dietary allowance (RDA) for iodine is 150-290 micrograms (mcg) for adults, while the Food and Nutrition Board of the Institute of Medicine has set the tolerable upper limit at 1,100 mcg.\(^18,23,24\) These guidelines may be inadequate to address certain health conditions. They were first established as sufficient only to prevent goiter. Daily doses for optimal health of 3,000-6,000 mcg have been used without side effects in studies of people with other iodine deficiency-related health conditions such as polycystic breast disease.\(^18\)

By way of comparison, the average daily Japanese consumption of iodine ranges from 5,280 to 13,800 mcg of iodine, with no harmful effects and a host of benefits.\(^18,25,26\) The Japanese experience is shedding new light on the importance of iodine, not only for thyroid health, but on other body functions as well. In particular, compelling evidence is emerging about the role of iodine in maintaining breast health, a major concern for millions of American women.

Since thyroid function is a puzzle to many people, we’ll begin with a brief overview of that important gland and its requirements for iodine. Then we’ll turn to the role of iodine in maintaining breast health, particularly in preventing breast cancer and fibrocystic breast disease.
Your Thyroid Gland and the Role of Iodine

Your thyroid gland is located in the front of your neck, just below your voice box. The thyroid produces two forms of thyroid hormone, both of which are derived from the amino acid tyrosine and several atoms of iodine. Thyroid hormones control your body’s metabolism, regulating everything from body temperature and heart rate to glucose consumption and even blood lipid levels.27-29

Too much thyroid hormone (hyperthyroidism) results in an excessively high metabolic rate. People with this condition have rapid heart rates and often palpitations,29 excessive sweating, and may feel much warmer than other people do, even in a cool room. In extreme cases they may lose weight and experience muscle weakness.

Too little thyroid hormone (hypothyroidism) results in just the opposite set of symptoms: a slower than normal heart rate,29 a chronic feeling of being cold, constipation, unexplained weight gain, dry skin, hair loss or coarse dry hair, weakness, muscle aches, depression, and fatigue.30,31 In extreme cases, people with low thyroid function experience cognitive decline,32 and babies born to mothers with inadequate iodine levels are at high risk for a unique form of mental retardation known as cretinism. Cognitive impairment caused by low thyroid function is reversible with iodine or thyroid hormone supplementation.32,33

Both over- and under-production of thyroid hormone are associated with the thyroid gland swelling known as goiter. In hyperthyroidism, the goiter is the result of inflammation of the gland as it is under attack by an overactive immune system.

In hypothyroidism, the goiter develops as the thyroid attempts to make more thyroid hormone in the absence of sufficient dietary iodine.

Iodine deficiency is the most common cause of goiter, and since it causes hypothyroidism, is also the most common endocrine (glandular) problem in the world.18 Iodine deficiency is most prevalent in people who live far inland, away from the oceans that provide our best source of iodine. Those areas are commonly referred to as “goiter belts,” because of the high rates of impaired thyroid function.5

Iodine deficiency disorders can produce symptoms of low thyroid function (hypothyroidism) even without abnormalities in measured thyroid hormone levels.34 Recent evidence suggests, for example, that iodine deficiency is linked to obesity, cognitive impairment, psychiatric disorders, fibromyalgia, and a variety of cancers.34
Paradoxically, another major consequence of mild-to-moderate iodine deficiency in older adults is hyperthyroidism (excessive thyroid function), especially in women. This is the result of rapidly growing thyroid gland nodules that over-produce thyroid hormone; it can trigger cardiac arrhythmias, osteoporosis, and muscle wasting.

Among those negative consequences is the impact of iodine deficiency on breast health. Compelling data are emerging that link iodine deficiency to breast cancers and high rates of fibrocystic breast disease, two of the greatest concerns of older women in the US. It's worth exploring those data here; including evidence that iodine supplementation can promote healthy breast tissue.

Fortunately, all iodine deficiency disorders and related health dangers can be prevented by adequate intake of iodine.

The Emerging Role of Iodine in Breast Health

Iodine deficiency is rapidly emerging as a major risk factor for breast cancer.

Human breast tissue and breast milk contain higher concentrations of iodine than the thyroid gland itself, which contains just 30% of the body's iodine stores. Breast tissue is rich in the same iodine-transporting proteins used by the thyroid gland to take up iodine from the blood. The evolutionary
OCTOBER 2011
LIFE EXTENSION
47

The Silent Epidemic of Iodine Deficiency

reasons for this are clear: iodine is essential to the developing newborn brain, so the mother’s body must have a direct means of supplying iodine to the nursing infant.18,39

Iodine plays an important role in the health of women’s breast tissue.40 In the presence of chemicals and enzymes found in breast tissue, iodine has been shown to exert a powerful antioxidant effect equivalent to vitamin C.18,41 Iodine-deficient breast tissue exhibits chemical markers of elevated lipid peroxidation, one of the earliest factors in cancer development.18,42-45

Iodine-deficient breast tissue also shows alterations in DNA and increases in estrogen receptor proteins.40 Coupled with iodine deficiency-induced increases in circulating estrogen levels, these changes can substantially increase the risk of breast cancer in women with low iodine levels.44

Iodine also helps regulate levels of the stress hormone cortisol and contributes to normal immune function.46-47 Abnormal cortisol levels and deficient immune function are significant contributors to the risks of breast cancer; women with fibrocystic breast disease may also suffer from elevated cortisol levels.48-51

Taken together, these biological factors explain the well-known link between iodine deficiency and thyroid disease, thyroid cancer, and breast cancer, all of which predominate in postmenopausal women.42,52,53

The link between iodine consumption and breast cancer is most evident when you compare the Japanese and Western diets against cancer incidence.

Japanese women consume a diet high in iodine-rich seaweed, which provides them with an iodine intake 25 times higher than the average American woman’s.54 Japanese women also have breast cancer rates roughly one-third of those found in American women, a difference that disappears in Japanese women who immigrate to the US, where they consume considerably less seaweed.18,52,55

Studies of iodine therapy for breast cancer prevention are encouraging. Continuous iodine given to cancer-prone rats cut mammary tumor rates nearly 2.5-fold.56 Breast cancer cells avidly absorb iodine, which in turn suppresses tumor growth and causes cancer cell death.57,58

Added dietary iodine reduces the size of both benign and malignant breast tumors, an effect credited in part to iodine’s direct reduction of lipid peroxidation levels.54,56 Although the doses of iodine used in these

Table 2. Prevalence of Iodine Deficiency in Australia3

<table>
<thead>
<tr>
<th>Group</th>
<th>% With Mild Deficiency</th>
<th>% With Moderate to Severe Deficiency</th>
<th>Total % Deficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant Women</td>
<td>29.6</td>
<td>19.8</td>
<td>49.4</td>
</tr>
<tr>
<td>Postpartum Women</td>
<td>34.6</td>
<td>19.2</td>
<td>53.8</td>
</tr>
<tr>
<td>Diabetic Patients</td>
<td>37.8</td>
<td>34.1</td>
<td>71.9</td>
</tr>
<tr>
<td>Normal Volunteers</td>
<td>47.4</td>
<td>26.3</td>
<td>73.7</td>
</tr>
</tbody>
</table>
physicians’ assessments. In those studies, only 33% of placebo recipients reported any benefit. No side effects were detected at any of the doses used.

It is becoming increasingly clear that iodine deficiency interferes with optimum breast health, and intake of levels far higher than the recommended dietary allowance of 150-290 mcg is required to achieve benefits. Daily amounts of 3,000-6,000 mcg may help relieve the symptoms of fibrocystic breast disease.

Iodine From The Sea: The Most Effective Natural Form

Earth’s oceans are the main repository of iodine on the planet, and nowhere is iodine as highly concentrated as in seaweed. In particular, seaweeds such as kelp and bladderwrack are capable of concentrating and storing iodine at astonishingly high levels. Scientists speculate that these primitive plants accumulate iodine to protect themselves from oxidative stress in the open ocean. Humans can reap the benefits of this natural process, because the iodine in these seaweeds is in the most biologically available forms, making it ideal for consumption.

The Role of Iodine in Cardiovascular Health

Iodine and iodine-rich foods enjoy a long history as natural therapies for hypertension and cardiovascular disease. Even when no overt symptoms are evident, hypothyroidism can contribute to heart disease and stroke, and it increases the risk of death from these conditions. Thyroid dysfunction creates unfavorable disturbances in lipid profiles, elevating low-density lipoprotein (LDL) and total cholesterol levels and raising the risk of atherosclerosis. Hypothyroidism also weakens the heart muscle, causing it to “squeeze” less firmly with each contraction; it can cause cardiac arrhythmias as well. These effects may not be evident at rest, but become important during moderate exercise. Low thyroid function is also associated with higher waist-to-hip ratios, an obesity-related risk factor for cardiovascular disease.

Restoring normal thyroid function helps reverse multiple cardiovascular risk factors, most notably...
Iodine Protects Against Stomach Cancer

The thyroid gland, breast tissue, and portions of the digestive tract share similarities in that all of them contain a rich concentration of iodine. Stomach lining cells in particular concentrate iodine, capitalizing on its antioxidant effects.

This has led medical researchers to investigate whether iodine deficiency plays a role in cancers of the digestive tract.

They found that people living in iodine-deficient areas of the world are not only prone to iodine-deficiency goiters, but also have higher rates of stomach cancers. Stomach cancer patients in a landlocked area of Iran were 2.5 times as likely to have severe iodine deficiency than control patients. Gastric cancer is the most common cancer in parts of northeastern Turkey where iodine deficiency is common, and iodine levels in gastric cancer tissue were markedly lower than those in surrounding healthy tissue.

Increased iodine intake has been strongly correlated with a reduction in stomach cancer rates in recent years.

Summary

Iodine is critical to healthy thyroid function. Its deficiency can cause weight gain, low energy, depression, cardiovascular disease, cognitive decline, and a variety of cancers.

Yet rates of iodine deficiency have reached epidemic levels, increasing fourfold over the past 40 years. A startling 74% of normal, “healthy” adults may no longer be consuming sufficient quantities.

Recent scientific analysis reveals that many commercial table salt brands now contain inadequate amounts of iodine. Emerging evidence points to the severe impact of low iodine on a wide range of health issues, including increased risks of breast cancer and fibrocystic breast diseases.

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

References


14. Caldwell KL, Jones R, Hollowell JG. Urinary iodine concentration:


23. Available at: http://lpi.oregonstate.edu/infocenter/minerals/iodine/.


Healthy sleep is one of the best ways to feel revitalized and maintain optimal health. Increasingly, research has shown the health benefits of a good night’s sleep. Melatonin is one of the most popular supplements for supporting sleep.

Now, pick the right melatonin for your needs with doses ranging from 300 mcg to 10 mg. For optimal results, melatonin should be taken within 30-60 minutes of going to sleep.

Caution: Consult your healthcare provider before taking this product if you are being treated for a medical condition (especially autoimmune or depressive disorders). Use caution if combining with alcohol. This product is not intended for children, pregnant or lactating women, or women trying to become pregnant. Do not attempt to drive or operate heavy machinery after taking this product.
A CONVENIENT WAY
TO BOOST YOUR IODINE

Most Life Extension® members already take a 5,000 IU capsule of vitamin D3 each day.

An efficient way of obtaining iodine is to use a formula that provides 1,000 mcg of Sea-Iodine™ along with 5,000 IU of vitamin D3.

By taking Vitamin D3 with Sea-Iodine™, individuals can obtain high potencies of two crucial nutrients in one capsule to maintain optimal health.

A bottle containing 60 5,000 IU capsules of Vitamin D3 plus 1,000 mcg of Sea-Iodine™ retails for $14. If a member buys four bottles, the price is reduced to $9.38 per bottle. Each bottle lasts most people two months.

Contains rice.
Due to the source of the kelp, this product may contain fish and shellfish.

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 hypercalcemia (high blood calcium levels). People with kidney disease, certain medical conditions (such as hyperparathyroidism or sarcoidosis), and those who use cardiac glycosides (digoxin) or thiazide diuretics should consult a physician before using supplemental vitamin D. If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner.

To order Vitamin D3 5,000 IU with Sea-Iodine™, call 1-800-544-4440 or visit www.LifeExtension.com

A huge percentage of the American population is failing to obtain enough iodine in their diet.
You probably won’t hear this from your doctor, but your brain’s gradually shrinking as you read this.

Why?

A certain amount of physical wasting or *atrophy*—also medically termed “regional deterioration of brain structure”—occurs in the brain naturally with age.¹ The impact of these *structural* alterations is vastly underestimated by both physicians and patients alike. This process usually commences around age 30, with marked acceleration observed at 50.

The results of physical brain deterioration can be dramatic. They include neurocognitive deficits, such as diminished attention span, verbal skills, spatial perception, deficits in abstract thinking and creativity, along with increased difficulty learning new tasks and retaining new information, flagging memory, and deteriorating sleep quality.

Maintaining a youthful brain in the face of these detriments of aging is perhaps the most crucial challenge of aging. The brain, our most important organ, is responsible for orchestrating a complex symphony of hormonal, neurochemical, and electrical signals to maintain the body in a state of vibrant health.

In this article, you will learn of the many insults on brain health in the modern world and what you can do to halt and reverse them. >>
Using sophisticated brain imaging techniques, researchers have shown that obese people literally have smaller brains than their age-matched, normal-weight peers. Using MRI analysis techniques, for example, scientists at the University of Pittsburgh showed that, among elderly subjects with apparently normal cognition, obesity is associated with declining volumes in several key areas of the brain. Furthermore, research suggests that the decline of the key brain chemical dopamine is related to the impulse to overeat, which in turn encourages obesity, perpetuating a vicious cycle of weight gain and increasing imbalances in brain neurotransmitters. This means that obesity accelerates cognitive decline, damages attention, erodes memory, and decreases your brain’s processing speed, while altering brain voltage.

**Calcification**

Aging is often accompanied by increased calcification; we essentially “turn to stone.” Brain calcification, which is sometimes associated with hyperparathyroidism, results in impaired brain processing speed. In older women with osteoporosis, bone loss has been shown to predict impaired brain processing speed. In older women with osteoporosis, bone loss has been shown to predict impaired brain processing speed. In elderly subjects with apparently normal cognition, obesity is associated with declining volumes in several key areas of the brain. Furthermore, research suggests that the decline of the key brain chemical dopamine is related to the impulse to overeat, which in turn encourages obesity, perpetuating a vicious cycle of weight gain and increasing imbalances in brain neurotransmitters. This means that obesity accelerates cognitive decline, damages attention, erodes memory, and decreases your brain’s processing speed, while altering brain voltage.

**Attention Impairment**

Subtle declines in memory, reasoning, and cognition are statistically likely to progress well beyond mere “forgetfulness” among many individuals. Sadly, a significant number of Americans will succumb to cognitive decline, and eventually to dementia, well before their bodies have given out. According to the Alzheimer’s Association, 5.3 million Americans are currently afflicted with this mind-robbing disease, and the ranks of the affected are expected to swell in coming years as more Baby Boomers attain elder status.

Mild cognitive impairment (MCI) is a related condition that often precedes the development of Alzheimer’s-type dementia. Some international studies suggest that up to 40% of older people will be affected by mild cognitive impairment worldwide, and many of these patients will go on to develop Alzheimer’s-type dementia. In a lecture I delivered at Columbia University, I noted that dementia takes 15 to 20 years to develop; by 80-85 years of age, up to 50% of Americans will suffer some form of dementia. But even by 70 or 80, nearly everyone experiences some cognitive loss.

**Obesity and Cognitive Decline**

In addition to brain atrophy, researchers have reported that just being overweight in middle age puts you at greater risk of having decreased cognitive abilities and suffering “steeper cognitive decline” later in life.

**How to Detect Attention Impairment**

Various forms of attention become impaired as the brain ages. Impairments can be quantified using objective tests, such as the test of variables of attention (TOVA). Forms of altered attention include the following:

- Omissions (missed stop signs, for example)
- Commissions (jumping the gun, for instance)
- Response time (slow response indicates flagging attention)
- Response variability (becomes inconsistent)
- Complex attention (can the subject “pull it all together”?)

According to the Alzheimer’s Association, 5.3 million Americans are currently afflicted with this mind-robbing disease, and the ranks of the affected are expected to swell in coming years as more Baby Boomers attain elder status.
Drug abuse and addiction impact numerous aspects of a person’s life. While the immediate costs are fairly well known, the long-term consequences of addiction receive less attention. Accelerated cognitive decline is one of them. Disturbances in the dopamine-driven “reward cascade” in the brain are associated with multiple drug-seeking behaviors. Alcohol, cocaine, heroin, marijuana, nicotine, and glucose all cause activation and neuronal release of brain dopamine. Dr. Kenneth Blum and I, along with other colleagues, have published numerous articles regarding our discovery that individuals with genetically determined deficits in certain dopamine receptors are at greater risk of addiction, due to abnormal cravings that are only satisfied by the “feel good” dopamine molecule. We have related this genetic abnormality to addictive, compulsive, and impulsive behaviors ranging from drug abuse to gambling to overeating that leads to morbid obesity.17-19

Experts are now projecting that as Baby Boomers age, the ranks of older drug abusers will grow significantly.20,21 Some drugs of abuse are outright neurotoxic, destroying brain structures even as they enhance the desire to continue abusing them.22 Others, like nicotine from tobacco, temporarily enhance memory and attention, but in the long term, tobacco “accelerates dementia processes.”23

Alcohol abuse results in cognitive impairment that may last long after sobriety is achieved. Alcohol abuse during pregnancy results in potentially severe, irreparable harm to the fetus’ developing nervous system. Tragically, fetal alcohol syndrome is the leading cause of retardation around the world.24 Alcohol-related impairments of executive brain functions manifest as a reduced ability to focus on tasks and pay attention.25 Other drugs that induce long-term cognitive deficits include cocaine, GBH (the so-called date-rape drug), amphetamines, MDMA (ecstasy), marijuana, and opiates such as heroin and oxycontin.22,26-31

Fortunately, it is possible to fight back and greatly improve one’s odds of aging gracefully with a sharp mind fully intact. From nutrients that support healthy brain structure to bio-identical hormones that help maintain youthful brain function, there’s plenty that can be done to prevent cognitive decline. Surprisingly, it begins not with the mind itself, but with muscle. Studies have repeatedly shown that older individuals who exercise regularly and maintain a healthy weight are less likely to succumb to cognitive decline, mild
cognitive impairment (MCI), and Alzheimer’s disease than their heavier, more sedentary peers.34,36

Shrinking muscle mass correlates with declining cerebral blood flow. Since sluggish cerebral blood flow is associated with a greater risk of cognitive impairment, it follows that building and maintaining adequate muscle mass equates with maintaining healthy cerebral blood flow. We once assumed that cerebral blood flow remains more or less constant, but we have recently discovered that exercise increases cerebral blood flow, possibly by speeding up brain metabolism.34,35,37,46,47

Strategies for Preserving and Enhancing Brain Function

Scientists recently published the results of a controlled trial that examined the effects of aerobic exercise on cognition and other biomarkers of Alzheimer’s disease among older adults diagnosed with mild cognitive impairment. Subjects were randomly assigned to engage in intensive aerobic exercise for 45 to 60 minutes per day, four days a week, for six months. Control subjects underwent supervised stretching sessions for equivalent periods, but did not engage in vigorous exercise. Results showed that aerobic exercise, but not simple stretching, acted as a “potent [non-drug-induced] intervention that improves executive control processes for older women at high risk of cognitive decline.”38

Another recent study conducted by the Mayo Clinic on more than 1,300 subjects concluded,

“Any frequency of moderate exercise performed in midlife or late life was associated with a reduced odds of having mild cognitive impairment.”37

Traumatic Head Injury: A Word of Caution

The National Football League (NFL) is just beginning to address the long-term effects on its players of countless head injuries sustained over the years on the gridiron. Meanwhile, primetime television dramas would have us believe that knocking a person unconscious is a humane, relatively harmless (and remarkably common) way to neutralize a bad guy. But the reality is quite different. Retired boxers who can barely speak are a better example of the effects of repeated head blows.

The NFL’s struggle with the issue is only the latest instance in which the media have focused, however fleetingly, on the dangers of traumatic brain injury (TBI). TBI is far more pervasive—and considerably more dangerous—than people imagine, or television dramas portray.

It is estimated that from 1.4 to 3.8 million Americans sustain TBIs each year, although many injuries go unreported.32,33 TBI encompasses sports-related concussions and repetitive head traumas. Symptoms may include loss of memory, sluggish reactions, aggressiveness, apathy, impulsiveness, reduced intellect, etc. It is a misconception that concussion is reliably signaled by unconsciousness.

Brain scans using magnetic resonance imaging (MRI), positron emission tomography (PET), or computed tomography (CT) are capable of detecting massive injuries, but many TBIs are missed by these methods due to the initial subtlety of symptoms. At PATH Medical, we evaluate brain function using a much broader range of assessments, including tests of brain electrophysiology, memory function, attention function, personality temperament and type, etc. If you suspect you or your child may have sustained a traumatic brain injury, never hesitate to seek professional evaluation and treatment.
The benefits of exercise are achieved through a variety of mechanisms, including enhanced production of key neurotransmitters.\textsuperscript{43,44} As I note in my book \textit{Younger You: Unlock the Hidden Power of Your Brain to Look and Feel 15 Years Younger} (McGraw-Hill, 2006), serotonin is an important brain chemical messenger associated with the regulation of mood and sleep. Deficiencies yield depression, fatigue, and poor sleep. Acetylcholine is a key neurotransmitter involved in cognition, memory, and learning. A deficit in acetylcholine, and its receptors, is associated with dementia and Alzheimer’s disease. Dopamine affects the body’s ability to regulate weight, experience pleasure, and feel energetic. When dopamine levels fall, obesity, addiction, and fatigue may result. Gamma-aminobutyric acid (GABA) is a crucial neurotransmitter that has a stabilizing effect on the brain’s other chemical messengers. GABA controls the brain’s rhythm, affecting one’s ability to handle stress and to function mentally and physically at a calm, steady pace.\textsuperscript{49}

In addition to these four foundational neurotransmitters, studies have shown that exercise increases production of a substance known as \textit{brain-derived neurotrophic factor}, which has been associated, at least in women, with enhanced cognitive function and brain plasticity.\textsuperscript{44,50-52} Exercise also encourages angiogenesis, or the formation of new blood supply structures. This is important for growing new brain cells and their supporting structures.\textsuperscript{50,53,54}

The Power of Neurogenesis: New Brain Growth and Life

When I attended medical school, we learned that many types of cells regenerate more or less constantly throughout life; in essence, entire organs are eventually renewed as old cells are replaced. But the brain and central nervous system represented a notable exception. Brain cells are finite, we were told, and soon after birth the ability to grow and regenerate neurons is irrevocably lost. Furthermore, dogma held, the myriad pathways and connections among adult brain cells are “fixed and immutable,” incapable of further adaptation, and certainly incapable of new growth.

We now know this is incorrect.\textsuperscript{55-58} Research conducted since the 1970s has shown that the growth of new nerves (a process known as neurogenesis) does occur. This growth plays an important role in the brain’s plasticity, or ability to remodel, especially in key areas of the brain, such as the hippocampus, which is responsible for some of the most important higher cognitive functions, including memory and emotion. It’s no coincidence that Alzheimer’s disease strikes the hippocampus first, eroding long-term memory.

While the hippocampus is vulnerable to the ravages of Alzheimer’s disease, it also responds to better nutrition and increased exercise, thereby promoting neurogenesis. In fact, scientists are only beginning to fully appreciate the dramatic implications of this discovery, which may yield new treatments for conditions ranging from mental illness and addiction to age-associated declines in memory and cognition.\textsuperscript{55,59-62}
Exercise Improves Sleep

One of the chief complaints among many of my elderly patients is poor sleep quality. Fortunately, exercise also improves sleep. And better sleep is also associated with increased neurogenesis in the adult brain. Conversely, poor sleep may restrict neurogenesis. By engaging in regular aerobic exercise you'll sleep better, age more slowly and improve the architecture, and thus health, of your brain.

Robust Brain Function, Robust Libido

A healthy brain correlates with better mental acuity—but also better sex. There’s a common saying that “the brain is the greatest erogenous zone.” This is truer than most of us realize. When the brain is alive, so are the sex organs. I’ve treated patients who came to me complaining of multiple problems, including failing memory and declining cognition, not to mention poor sleep quality and sluggish libido. My patients have experienced remarkable success reversing these declines using treatments ranging from nutrients, to better dietary habits, to electrocranial stimulation, to bioidentical hormone replacement therapy. In some cases it is necessary to treat underlying conditions such as hypertension, which is a contributing factor in vascular dementia, before success is achieved. After treatment, patients experience improved memory, reasoning and intellect, and they have been known to rave about their reignited sex lives.

Summary

Maintaining youthful cognitive function is a crucial challenge of aging, both in terms of cognitive function and structural deterioration or “brain wasting.” Declining memory function may begin as early as age 30 and is often evident after 50 years of age. Fortunately, it is possible to take proactive steps to maintain youthful cognition with aging. Maintaining a healthy body weight and body fat percentage may help preserve healthy brain structure and function. Frail bones have been linked with cognitive decline in women. Hormonal balance may promote healthy cognitive function. Traumatic brain injury is a common yet overlooked cause of cognitive difficulties. Exercise increases blood flow to the brain and may decrease the risk of cognitive decline, while promoting healthy sleep. A healthy diet and extra nutritional support further enhance cognitive function.

Causes of Dementia

Many medical conditions can contribute to dementia. These include:

- Alzheimer’s disease
- Vascular dementia
- Hormone or neurotransmitter deficiencies/imbalance
- Toxic disorders
  - Alcoholism/drug abuse/intoxication
  - Heavy metal intoxication (e.g., lead, mercury, etc.)
- Vitamin deficiencies especially B vitamins (B1 [thiamine], B2 [riboflavin], B12)
- Organ failure or dysfunction
  - Hypothyroidism
  - Hypo- and hyperparathyroidism
  - Kidney failure
  - Liver failure
  - Respiratory failure
- Chronic infections
  - HIV
  - Neurosyphilis
  - Tuberculosis
  - Prion diseases
- Head trauma
  - Boxer’s syndrome
  - Traumatic brain injury (e.g., concussion)
  - Chronic subdural hematoma
- Neoplastic conditions
  - Primary brain tumor
  - Metastatic brain tumor
- Psychiatric disorders
  - Depression
  - Schizophrenia
- Degenerative diseases
  - Huntington’s disease
  - Amyotrophic lateral sclerosis (ALS or Lou Gehrig’s disease)
  - Multiple sclerosis
  - Dementia with Lewy bodies

*This list is not intended to be comprehensive

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

Exercise

Exercise is crucial for preserving and even enhancing brain function as we age.

- Exercise increases cerebral arterial blood flow.\textsuperscript{46,64}
- Exercise promotes angiogenesis and stimulates neurogenesis in the adult hippocampus.\textsuperscript{50}
- Exercise promotes production of beneficial brain proteins called neurotrophins.\textsuperscript{65,66}
- More muscle equates with better cerebral arterial blood flow, and thus better cognition.

Healthy Diet

A healthy diet forms the foundation for successful aging. Diets high in saturated fat and cholesterol are significantly linked to an increased risk of dementia.\textsuperscript{67,68}

In contrast, diets high in omega-3 oils and olive oil (found in the Mediterranean diet) are linked to a significantly reduced risk of dementia.\textsuperscript{69-71}

Follow the antioxidant-rich “Rainbow Diet,” which is nutrient-dense, not calorie-dense.\textsuperscript{49} The Rainbow Diet is low in sodium and saturated fat and high in fiber. It is also anti-inflammatory. As its name implies, the Rainbow Diet emphasizes the consumption of a wide range of foods in all colors of the rainbow. White foods are excluded from this diet, with the exceptions of yogurt and egg whites.\textsuperscript{49}

Bioidentical Hormones*

Levels of many hormones decline with advancing age. It is possible to restore the body and mind to youthful vigor by re-establishing and maintaining youthful levels of these crucial hormones, under the supervision of a qualified physician. Some are available as supplements (e.g., DHEA, melatonin, vitamin D3), while others require a doctor’s prescription and supervision.\textsuperscript{49}

- Dehydroepiandrosterone (DHEA)/DHEA-S
- Erythropoietin
- Estradiol
- Human growth hormone (HGH)
- Insulin-like growth factor (IGF)
- Insulin
- Melatonin
- Parathyroid hormone
- Pregnenolone
- Testosterone
- Vitamin D3

Dr. Braverman’s Nutrient Recommendations

Nutrients are essential tools for keeping your brain young and fit. They are capable of increasing your brain power and processing speed, while simultaneously addressing specific adverse conditions throughout the rest of the body.\textsuperscript{49}

- Omega-3 fatty acids (fish oil): 2,000-6,000 mg/day (containing a minimum of 1,400 EPA and 1,000 mg DHA)
- Vitamin D3: 2,000-10,000 IU/day
- Coenzyme Q10: 100-300 mg daily
- Resveratrol: 250-500 mg daily
- Vitamin C: up to 4,000 mg daily
- B complex: 50-100 mg daily
- Acetyl-L-carnitine: up to 1,500-3,000 mg per day
- Acetyl-L-carnitine arginate: 1,000 mg per day
- R-lipoic acid: 150-400 mg daily
- Phosphatidylserine: 100-200 mg per day
- Ashwagandha: 250 mg per day
- Vinpocetine: 15-30 mg per day
- Alpha-glycerylphosphorylcholine (GPC): 600 mg per day
- Zinc: 30-90 mg/day (Editor’s note: Individuals supplementing with more than 50 mg of zinc should take at least 2 mg of copper daily.)
- Vitamin K2: 100 mcg to 2,100 mcg daily

Drug Therapy

Certain prescription therapies may promote more successful aging.

- Antihypertensive therapy. Evidence suggests that antihypertensive drugs may help reduce the risk for, and progression of, dementia.\textsuperscript{72}
- Antidepressants. Modern antidepressants increase neurogenesis and preserve neurotransmitters.\textsuperscript{73,74}

*(For a complete list, see my book, Younger You)\textsuperscript{49}


DHEA (dehydroepiandrosterone) has demonstrated many benefits, including positive effects on body composition. Regrettably, our natural production of this hormone diminishes by about 80% between the ages of 25 and 75 years. This has been associated with a decrease in muscle mass and strength and an increase in abdominal girth.

In the first of the two studies sponsored in part by the National Institutes of Health, researchers sought to determine the effect of DHEA replacement in DHEA-deficient elderly individuals. They randomized 56 men and women to receive either 50 mg/day of Life Extension’s DHEA before bedtime or a placebo. Both groups then underwent a program of resistance training for four months. At the end of the study, DHEA replacement produced a significantly greater effect in enhancing the benefits of weight training on muscle mass and strength in both men and women compared with the placebo group.

The second study cited was conducted by the same research team. The effects of DHEA-replacement therapy or a placebo on abdominal fat were investigated for the first time in 56 DHEA-deficient elderly men and women who did not exercise regularly. Using the same DHEA-dosing regimen as in the previous study, the researchers found that DHEA levels rose to youthful ranges in both men and women. This increase was accompanied by changes in body composition. Compared with miniscule changes in weight loss in the placebo group, women taking DHEA lost an average of 10.2% of their visceral (intra-abdominal) fat, while men shed an average of 7.4%. Subcutaneous fat (under the skin) losses averaged 6% in both men and women taking DHEA.

DHEA is widely available as a dietary supplement. These two studies utilized Life Extension’s DHEA formulation to safely restore DHEA levels to youthful ranges in these elderly individuals, which helped maximize lean tissue mass, maintain healthy abdominal weight, and support insulin sensitivity.

References:

To order DHEA call 1-800-544-4440 or visit www.LifeExtension.com

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

**CHOOSE THE DOSE THAT’S RIGHT FOR YOU:**

**DHEA 15 mg, 100 Capsules,**  
Item # 00454
While published studies show the greatest benefit occurs when 50–75 mg of DHEA is consumed each day, some women only need a low dose of DHEA. Just one of these 15-mg capsules a day is all some women need to bring DHEA levels back to youthful levels. A bottle containing 100 15-mg capsules of DHEA retails for $12; if a member orders four bottles, the price is reduced to just $7.50 per bottle. Contains rice.

**DHEA 25 mg, 100 Capsules,**  
Item # 00335
The minimum dose of DHEA for most healthy aging people is 25 mg a day, though optimal doses are 50–100 mg daily. These 25-mg capsules are a popular way to consume the precise amount of DHEA your body may need. A bottle containing 100 25-mg capsules of DHEA retails for $15; if a member orders four bottles, the price is reduced to just $9.38 per bottle. Contains rice.

**DHEA 25 mg, 100 Dissolve-in-Mouth Tablets,**  
Item # 00607
A bottle containing 100 25-mg dissolve-in-mouth tablets of DHEA retails for $14; if a member orders four bottles, the price is reduced to just $8.81 per bottle. Contains corn.

**DHEA 50 mg, 60 Capsules,**  
Item # 00882
The optimal daily dose of DHEA for most people is 50 mg. These economical 50-mg capsules enable most people to conveniently consume the optimal dose of DHEA in just one capsule. A bottle containing 60 50-mg capsules of DHEA retails for $16; if a member orders four, the price is reduced to just $10.50 per bottle. Contains rice.

**7-Keto® DHEA 100 mg, 60 vegetarian Capsules,**  
Item # 01271
7-Keto® DHEA is a metabolite of DHEA that safely increases fat-burning enzymes in the liver. Human subjects who consumed 200 mg of 7-Keto® DHEA a day in conjunction with a diet and exercise program lost more total weight and body fat than those who took a placebo. Since 7-Keto® DHEA does not convert to estrogen or testosterone in the body, it can be used by those with hormone-sensitive cancers such as breast and prostate cancer. This 7-Keto® DHEA supplement contains a potent antioxidant blend to protect against free radicals that might be formed in response to increased fat-burning. A bottle containing 60 100-mg vegetarian capsules of 7-Keto® DHEA, along with a special antioxidant blend, retails for $40; if a member orders four bottles, the price is reduced to only $27 per bottle. Contains rice.


**DHEA Complete (25 mg DHEA+100 mg 7-Keto® DHEA), 60 vegetarian Capsules,**  
Item # 01250
To obtain optimal potencies of both forms of DHEA, the DHEA Complete formula provides 25 mg of DHEA, 100 mg of 7-Keto® DHEA, and a potent antioxidant blend in each capsule. For those seeking to combine the multiple benefits of DHEA and 7-Keto® DHEA, this is the ideal single-formula supplement. A bottle containing 60 vegetarian capsules of DHEA Complete retails for $48; if a member orders four bottles, the price is reduced to only $32.40 per bottle. Contains rice.

**DHEA 100 mg, 60 Capsules,**  
Item # 00883
Some people produce so little DHEA that they need to take high doses. These 100-mg capsules provide high-potency DHEA at a very low cost. A bottle containing 60 100-mg capsules of DHEA retails for $22.50; if a member orders four bottles, the price is reduced to just $14.25 per bottle. Contains rice.

$50 81 p
$32 40 p
$14 25 p
Optimized Carnitine with GlycoCarn®

Diminished cellular energy production is an inevitable consequence of aging. As adults mature, the cellular power plants known as the mitochondria become dysfunctional. The resulting slowdown in energy production manifests in numerous health problems.

Nutritional researchers have discovered that the amino acid carnitine promotes the burning of fat for fuel in the mitochondria, thus promoting youthful levels of cellular energy production." Researchers have now identified several optimized, next-generation forms of carnitine that not only help boost cellular energy production, but also may confer targeted benefits for the brain, heart, muscles, and central nervous system.

Optimized Carnitine with GlycoCarn® combines these advanced forms of carnitine—acetyl L-carnitine, glycine propionyl L-carnitine, and acetyl L-carnitine arginate—in a single formula that provides balanced, broad-spectrum support for cellular energy production throughout the body.

Acetyl L-carnitine readily crosses the blood-brain barrier to combat oxidative stress and promote energy production in critical brain and central nervous system tissues. Acetyl L-carnitine also supports healthy brain function by stimulating the release of acetylcholine and dopamine, two neurotransmitters that play vital roles in brain health and communication.

Acetyl L-carnitine arginate has an added molecule of arginine that enables it to augment the effects of acetyl L-carnitine, promoting the growth of neurites that facilitate communication among nerve cells in the brain.

GlycoCarn® is a patented form of glycine propionyl L-carnitine that quickly penetrates into heart, endothelial, and muscle cells, with effects that range from protecting heart muscle from lack of blood flow to combating muscle fatigue by increasing muscle energy stores of glycogen.

Two capsules of Optimized Carnitine with GlycoCarn® provide:

- Acetyl L-carnitine HCl: 800 mg
- ArginoCarn® Acetyl L-carnitine Arginate Di-HCl: 300 mg
- GlycoCarn® Glycine Propionyl L-Carnitine HCl: 300 mg

A bottle of 60 vegetarian capsules of Optimized Carnitine with GlycoCarn® retails for $29. If a member buys four bottles, the price is reduced to only $19.58 per bottle.

To order Optimized Carnitine with GlycoCarn®, call 1-800-544-4440 or visit www.LifeExtension.com

GlycoCarn® and ArginoCarn® are registered trademarks of Sigma-tau HealthScience, Inc., and are protected by US patent Nos. 6,703,042 and worldwide patent EP1202956. The combination of multiple forms of Carnitine is protected by Sigma-tau patent # 6,245,378.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
It starts with forgetting where you put your car keys. Then you can’t remember a loved one’s birthday. A few years later, it takes a moment to recall an old friend’s name. Sadly, brain degeneration affects all aging adults. However, enhanced communication between neurons may hold the key to maintaining youthful cognition and memory.

Cognitex® with Pregnenolone & NeuroProtection Complex provides 9 cutting-edge brain boosting supplements in one exciting formula!

We all strive for a youthful brain, but the key to brain power may come from uridine-5’-monophosphate (UMP), a compound that is naturally found in the milk of nursing mothers and is essential to humans when their brains are the youngest — as infants. More importantly, UMP supports superior cognitive function in aging adults.

In order to bolster this improved brain function, Cognitex® contains Sharp-PS® GOLD to promote normal neuronal cell membrane activities and structure. With this structure in place, vinpocetine enhances circulation and oxygenation of brain cells while phospholipid-grape seed extract improves blood vessel tone and elasticity, thus boosting oxygen flow to the brain.

Wild blueberry extract has been added to protect against free-radical damage, and pregnenolone may have beneficial properties as well.

In order to protect against inflammation to a healthy brain, a proprietary NeuroProtection Complex Blend contains standardized extracts of hops, ginger, and rosemary — all known to have anti-inflammatory capabilities.

With a healthy brain in place, the proper levels of acetylcholine are needed to enable brain neurons to communicate. To maintain these levels, Cognitex® includes alpha-glyceryl phosphoryl choline (A-GPC) to boost acetylcholine and Sensoril® ashwagandha extract to inhibit an enzyme that degrades acetylcholine in the aging brain.

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

To order Cognitex®, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Novel Methods to Cure Drug Addiction
There is a drug-induced death in this country every 15 minutes,\(^1\) a trend that has risen steadily over the past decade. Despite a trillion dollars\(^2\) having been spent on this nation’s “drug wars” over the past six decades, more addictive and lethal compounds are used by Americans than ever before.\(^3\)

Why are we losing the war against drug addiction? One pioneering physician has a simple answer. Life Extension\(^\text{®}\) recently had the opportunity to speak at length with Dr. Marvin “Rick” Sponaugle. Board certified in both anesthesiology and addiction medicine, Sponaugle rejects addiction treatment that is based solely on counseling, the preferred methodology among almost all drug treatment facilities in the United States (97\%).\(^4\)

Instead, he combines state-of-the-art technology with safe, low-cost, natural interventions, including hormones, supplements, and restoration of gut ecology. The efficacy of his approach speaks for itself. While national relapse rates range as high as 90\% by some estimates,\(^5,6\) Dr. Sponaugle has treated over 5,000 substance abusers—with a relapse rate of only 9\%!\(^7\)
According to Dr. Sponaugle, most detox and rehab programs are ineffective because they do not address the root problem. “Patients continue to relapse until their brain function is optimized. Otherwise, patients will continue to use drugs to stimulate underactive brain regions and to calm overactive brain regions. We have learned that successful addiction treatment requires diagnosis and treatment of multiple underlying biochemical and medical disorders.”

Official statistics support Sponaugle’s contention. The National Institutes of Health report that long-term drug abuse induces adverse chemical alterations in the brain that remain long after someone has stopped using drugs. This simple fact supports a multitargeted neurochemical intervention over behavioral approaches like counseling.

**What Is Addiction?**
**Dr. Sponaugle’s Viewpoint**

Conventional medicine and most of society have long viewed addictions as pathological behavior over which the sufferer is expected to have a great deal of control. That, says Dr. Sponaugle, has led to conventional treatments that basically try to talk the patient out of a biochemical craving.

Sponaugle, who trained as an anesthesiologist, intensive care specialist, and pain management specialist, was horrified early in his career to see physicians allowing their addicted patients to undergo painful and dangerous withdrawal symptoms. This type of “cold turkey” withdrawal can be lethal to someone whose entire physiological system is out of balance due to substance abuse. In one instance, a nurse who had a heart transplant and was addicted to 3,200 mg/day of OxyContin® was placed in Dr. Sponaugle’s care by her university heart surgeons because they knew that traditional detox could harm her transplanted heart.

Sponaugle recognized that addictive behavior is the product of two major inputs to brain chemistry. First, a person’s inherited characteristics determine the ebb and flow of certain neurotransmitters in the brain. Second, acquired changes further amplify imbalances in those vital brain chemicals.

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**ADDICTION STATISTICS: USA**

<table>
<thead>
<tr>
<th>Category</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of persons 12 years of age and over with any illicit drug use in the past month</td>
<td>8%</td>
</tr>
<tr>
<td>Number of persons 12 years of age and over with any nonmedical use of a psychotherapeutic drug in the past month</td>
<td>6.2 million</td>
</tr>
<tr>
<td>Percentage of young adults (ages 18-25) who reported driving under the influence of alcohol at least once in the year 2000</td>
<td>19.9%</td>
</tr>
<tr>
<td>Emergency Department (ED) visits for drug misuse or abuse</td>
<td>2.1 million</td>
</tr>
<tr>
<td>ED visits for pharmaceutical misuse or abuse by adults aged 50 or older in 2008</td>
<td>256,097 (a 121% increase from 2004)</td>
</tr>
<tr>
<td>ED visits for illicit drug use by adults aged 50 or older in 2008</td>
<td>118,495</td>
</tr>
<tr>
<td>• Cocaine 63%</td>
<td></td>
</tr>
<tr>
<td>• Heroin 27%</td>
<td></td>
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<tr>
<td>• Marijuana 19%</td>
<td></td>
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<tr>
<td>• Illicit stimulants 5%</td>
<td></td>
</tr>
<tr>
<td>Number of Americans needing treatment for substance abuse and addiction in 2004</td>
<td>22.5 million</td>
</tr>
<tr>
<td>Number who received treatment</td>
<td>3.8 million</td>
</tr>
<tr>
<td>Percent of illegal drug users who are employed</td>
<td>71%</td>
</tr>
<tr>
<td>Days of work lost to alcoholism annually</td>
<td>500 million</td>
</tr>
</tbody>
</table>
Sponaugle uses high-tech SPECT (single-photon emission computed tomography) scans of the brain to demonstrate changes in brain blood flow and neurotransmitter activity in patients with various kinds of addictions. Remarkably, there are characteristic patterns on those images that correlate with different addictive substances, and even with behaviors such as video game addictions.13-15

Most experts have used those SPECT scans to study the impact of the drug or the behavior on brain function. Sponaugle’s key insight, however, was to recognize that certain patterns of brain activity themselves make addiction more likely.

Sponaugle says some of these brain activity patterns reflect inherited patterns of brain chemistry. People who display these patterns, he says, simply learn that they can feel “more normal” when they use a particular chemical substance.

But that’s only half of the story, says Sponaugle. He feels it is also important to diagnose and treat acquired alterations in brain chemistry that further promote substance use. Such changes include those wrought by chronic exposure to pharmacologic drugs and other environmental toxins, and especially those produced by changes in normal gut bacteria.

Unless we address both inherited and acquired patterns of brain chemistry, Sponaugle argues, we will routinely fail to treat the underlying factors that sustain addictive behavior. The result? Addicts will continue to use chemical substances to “medicate” themselves to achieve a sense of normality, resulting in the kinds of high relapse rates we see in conventional addiction treatments.

**Inherited Abnormalities in Brain Chemistry**

According to Sponaugle, the overwhelming majority of his 5,000 successfully treated patients have areas of their brains that are either overactive or underactive.7 And that abnormal activity level helps determine the kind of drug, substance, or behavior a person may turn to in order to “normalize” their feelings.

The underactive areas most commonly involve the prefrontal cortex (brain region behind the forehead) and the pleasure or reward system of the brain. People with diminished activity in the nucleus accumbens (reward center) display what scientists call “reward deficiency syndrome,” or RDS.16 People with RDS have a hard time feeling “normal” responses to positive events, leaving them essentially hungering for happiness. Neurons in those low-activity areas are primarily driven by the neurotransmitter dopamine;
addicts tend to display marked deficiencies in dopamine activity in both areas. As a result, says Sponaugle, people with RDS often seek to rebalance their brains with stimulating substances or behaviors that produce a dopamine surge in their pleasure center. For example, these patients might become addicted to cocaine, opiate drugs such as morphine or heroin, or stimulants such as amphetamines.

Dr. Sponaugle has demonstrated these effects graphically in a series of SPECT scans on his patients with addictions to cocaine and OxyContin: all of them showed marked reduction in activity of neurons that rely on dopamine. Sponaugle refers to these areas as “dopamine holes,” and he uses them as a diagnostic feature as he seeks to rebalance his patients’ brain chemistry.

People with overactive brain regions have an entirely different set of problems and are likely to become addicted to “calming” substances, according to Sponaugle. Neurotransmitters involved in these areas are excitatory chemicals such as dopamine, histamine, glutamate, epinephrine (adrenalin) and norepinephrine. Their effect is to increase electrical activity of brain cells. At low levels of excess activity, patients may experience mild anxiety or insomnia. At higher levels, they may experience panic attacks or even live in a more or less continuous panic mode.

This increased activity also shows up on SPECT scans, most notably in patients with high levels of anxiety or with panic disorders. Histamine is especially active in such patients’ brains. Dr. Sponaugle has a large file of SPECT scans showing overactive brain regions derived from elevated histamine activity in his patients addicted to “calming” substances such as alcohol, benzodiazepine anti-anxiety medications (e.g., Valium or Xanax), and again, opiates.

Acquired Abnormalities in Brain Chemistry

According to Dr. Sponaugle, people are “set up” for addictions by their inherited brain chemistry patterns. But that alone is not always enough to trigger an addiction. A “second hit” is usually required, typically in the form of imbalances in two important biological areas, the intestine and the endocrine (hormonal) system.

Gut Imbalance

The human gut is frequently referred to as the “second brain,” because of its normally high production of serotonin and other neurotransmitters. Sponaugle says his clinical research suggests that “Addiction is more frequently caused by toxins from the gut than from any other single causation.”

Alterations in the patterns of intestinal bacteria, coupled with ingestion of toxins from the environment, can produce what is known as intestinal hyperpermeability or “leaky gut,” a damaged intestinal lining that allows substances that normally would be eliminated in the stool to be absorbed into the bloodstream, with consequences in the brain. Bacterial overgrowth in the gut may also interfere with serotonin. According to Dr. Sponaugle, food allergies cause elevated histamine levels that lead to increased electrical activity throughout the brain. Histamine’s chemical structure is closely related to dopamine, and Dr. Sponaugle believes that histamine stimulates dopamine activity in the brain.

Hormonal Imbalance

Dr. Sponaugle says that his clinic has found hormonal imbalances to be one of the most common causes of addiction in middle-aged women. This is hardly surprising, since hormones such as estrogen, progesterone, and pregnenolone are known to have powerful effects on brain function, yet traditional centers fail to evaluate female hormones. These “neurosteroids” are potent modulators of the neurotransmitters dopamine, serotonin, and gamma-aminobutyric acid (GABA), so
Dr. Sponaugle's unique approach focuses on determining abnormal brain chemistry patterns and then rectifying them. In order to correctly assess biochemical and medical disorders that can distort brain chemistry and cause various addiction and anxiety issues, Sponaugle conducts a comprehensive analysis of more than 65 brain chemicals, hormones, enzymes, toxins, amino acids, infectious biomarkers, and vitamins through blood and urine testing.

This extensive evaluation allows Sponaugle to determine the root causes of each individual’s addictive behaviors. In many cases, the possibilities of exposure to mold and industrial toxins are also evaluated.

Dr. Sponaugle is critical of conventional addiction treatment programs, noting that most focus only on one or two aspects of drug addiction.

Instead, Sponaugle uses a combination of treatments he refers to as nutritional and rapid detox. Sponaugle’s nutritional detox provides intravenous amino acids, vitamins, and minerals to remedy biochemical imbalances safely.

Dr. Sponaugle drew on his extensive anesthesia and intensive care training to develop his rapid detox protocol. In this phase, he administers intravenous (IV) sedation and other medications that help blunt or block symptoms of physical withdrawal. These symptoms are typically related to elevated levels of “fight or flight” hormones like adrenaline that produce anxiety, agitation, palpitations, and jitteriness. Those unpleasant feelings, left uncorrected, make the detox experience so uncomfortable that many addicts prefer the addiction itself.

Dr. Sponaugle customizes his protocol to each patient, which helps him avoid any of the effects of the withdrawal-related adrenaline surge. His continued assessment and balancing of hormone and neurotransmitter levels over the longer term enables his patients’ recovery process to be more effective.

Two cases from Dr. Sponaugle’s clinical experience serve to illustrate his approach.

Jennifer

Jennifer was a 54-year-old nurse who began drinking large amounts of wine at age 50 (she had previously been a light social drinker only). On arrival at Dr. Sponaugle’s clinic, she had just returned from a 28-day, $46,000 stay at a treatment center in Arizona, relapsing just four days after returning home.

Jennifer’s brain scan revealed both areas of low dopamine activity (dopamine holes in her prefrontal cortex) and an overactive deep limbic region linked with serotonin and taurine deficiency. Her brain scan revealed generalized overactivity, likely due to elevated histamine from her leaky gut syndrome. Her urinary...
neurotransmitter testing revealed low serotonin and taurine levels, and a markedly elevated histamine level, vividly demonstrating brain chemical imbalances associated with excessive wine consumption.

Complicating her alcohol-related serotonin deficiency was Jennifer's menopausal low estradiol levels, making her brain resistant to what serotonin she did produce. The Arizona treatment center had started her on serotonin-boosting SSRI (selective serotonin reuptake inhibitor) medication [Lexapro®], but it had no effect on her menopausal serotonin-resistant receptors.

The net result, says Dr. Sponaugle, was an overactive limbic system creating a steady beat of depression and anxiety. It is hardly surprising that without further treatment, Jennifer quickly resorted to self-medication with her drug of choice: alcohol.

Jennifer was started on high-quality supplements including 5-hydroxytryptophan (5-HTP), allowing her brain to begin making more serotonin. She was also given appropriate estradiol replacement to restore her serotonin receptors to their normal sensitivity. She used a gut-detoxifying formula, probiotics, and a combination of L-glutamine, gamma-oryzanol, and soothing herbs to help heal her intestine.

Jennifer has been alcohol-free for more than 15 months and experiences absolutely no craving for alcohol. Jennifer describes her own progress as “amazing.”

Editor's note: Individuals taking selective serotonin reuptake inhibitor drugs such as Lexapro® should not take 5-HTP.

Susan

Susan was a 21-year-old woman who came to Dr. Sponaugle’s clinic with her mother. Susan had been drinking two liters of vodka while consuming 1,000 mg of OxyContin® (a narcotic) and 20 mg of Xanax® (an anti-anxiety drug) daily. Susan’s problems had begun at age 12, since which time she had attended eight drug rehab programs at a cost of $240,000.

Susan had begun by raiding her parents’ liquor cabinet to “calm her anxious brain.” Dr. Sponaugle learned that Susan had not experienced anxiety issues prior to age 12, which was also, significantly, the age when she began having her periods, which were always longer and heavier than those of her peers.

Sponaugle recognized in Susan the classic presentation of progesterone deficiency. Her ovaries were producing normal levels of estrogen unopposed by progesterone, a situation known to result in enhanced anxiety. Her relatively high estrogen levels also boosted dopamine production, further adding to overactivity in Susan’s anxiety-producing brain regions. Like Jennifer, then, Susan began by drinking the most readily-available calming drug she could find: alcohol. Her alcohol consumption contributed to the kind of toxic yeast overgrowth in the gastrointestinal tract that Dr. Sponaugle has found is associated with deficiencies of serotonin and taurine (two calming brain chemicals) in alcoholic patients. Her ensuing leaky gut contributed to elevated brain histamine activity.

Quite naturally, then, Susan turned to stronger drugs that could calm the mounting anxiety levels triggered by excess histamine activity. She discovered the soothing nature of narcotics and the calming influence of the benzodiazepines (such as Xanax®).

Sponaugle began by optimizing Susan’s hormonal levels (the original problem) and balancing her brain chemistry. He aggressively detoxified her gut with natural supplements designed to kill the yeast Candida albicans and other unwanted organisms. And he restored levels of nutrients and minerals that had been deficient.

Susan is now more than three years post-treatment without a single relapse. Says Sponaugle, “She is well on her way to enjoying a wonderful future.”

Summary

While millions of Americans suffer from chemical addictions, conventional detox and treatment programs have dismal success, with relapse rates ranging from 50-90%. Few such programs take into account the complicated inherited and acquired abnormalities in brain chemistry associated with addictions, focusing instead on frustrating “talk therapy” or medical detoxification strategies. Marvin “Rick” Sponaugle, MD, is a board certified anesthesiologist and addiction specialist who incorporates state-of-the-art brain science and comprehensive biochemical testing to understand each addict’s unique pattern of brain chemistry. He uses this information to determine precisely how and why each person is self-medicating with their drug(s) of choice to achieve what for them is often the only semblance of “normalcy” they can experience. Armed with this information and an understanding of integrative health, Sponaugle first detoxifies his patients while administering deficient amino acid brain chemical precursors, vitamins, and minerals, along with medications to neutralize their uncomfortable adrenaline surges. He then administers a comprehensive program of biochemical and hormonal balancing to remove the driving forces behind the addiction. Sponaugle’s results speak for
Dr. Sponaugle reports exceptionally successful results with his biochemically-based addiction treatment programs. He has now applied the same principles of detoxification and chemical balancing to other apparently intractable conditions. Among these, the most intriguing are his management of neurological illnesses such as multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS, also called Lou Gehrig’s Disease), attention deficit/hyperactivity disorder (ADHD), and even Alzheimer’s disease (AD).

Says Sponaugle, “US physicians lag far behind their European counterparts in recognizing the role played by biotoxins, especially those from indoor molds and solvent toxins such as benzene and toluene, in the causation of MS, AD, and other neurological conditions.” Sponaugle notes that basic science studies have long demonstrated a relationship between mold toxins and MS. In MS, brain cells lose their vital insulating sheath of the fat-and-protein material called myelin, leading to the debilitating symptoms of the disease. It is now well documented that fungi, including molds, release toxins that activate immune system cells and trigger them to destroy brain cells. Nonetheless, says Sponaugle, American physicians continue to tell their patients that the cause of MS is unknown.

There is increasing evidence that fungal toxins play a causative role in other neurological conditions as well, including Alzheimer’s disease. In this condition, fungal toxins have been identified in actual brain or nerve tissue from sufferers of the disorders. Tissue from these patients and those with other neurological disorders also contains high levels of an enzyme that targets the fungal protein called chitin, which is not otherwise found in the human body.

Molds and their toxins are distressingly prevalent in our food supply. One study demonstrated that nearly 20% of corn samples from the midwest contained one of the four most dangerous fungal toxins. Sponaugle says that one in four Americans, 24%, have a particular genetic factor that interferes with the effective removal of mold and industrial toxins. He sees this genetic factor in 80% of his non-addicted “wellness” patients who suffer common maladies such as chronic fatigue syndrome, fibromyalgia, and even poorly-defined malaise, in addition to neurological conditions such as depression, anxiety, rage, and bipolar symptoms.

Dr. Sponaugle has turned his observations into solid clinical practice. He has designed an aggressive intravenous treatment model for toxin removal that is highly successful at diminishing symptoms of his patients suffering from MS as well as other debilitating brain disorders such as ALS, Parkinson's disease, Alzheimer’s disease, and autism.
themselves: his patients’ relapse rate is just 9%. Patients and family members can find more information at: http://floridadetox.com.

For more information visit www.floridadetox.com or call 1-888-775-2770.

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

Dr. Marvin Sponaugle

References

The Optimal Tryptophan Formula!

When tryptophan is ingested as a food or supplement, it is naturally degraded by specialized enzymes in the body. The problem is that activity of one of these enzymes increases with age, thereby denying the brain the tryptophan it needs to produce adequate serotonin. The result of the excess degradation of tryptophan can be seen in serotonin-associated troubles, such as:

1) Poor sleep quality
2) Emotional mood and stress
3) Weight gain and appetite
4) Loss of feeling of well-being

The degradation of tryptophan in the body can be inhibited with the intelligent use of other nutrients. For instance, the amino acid lysine competes with tryptophan in the same oxidative degradation pathway. This means that in the presence of sufficient lysine, less tryptophan is broken down through oxidation.

The primary tryptophan-degrading enzyme is overactivated by inflammatory cytokines. The most comprehensive way to suppress the inflammatory factors that cause the enzymatic degradation of tryptophan is to take the proper dose of niacinamide along with extracts from ginger, hops, and rosemary.

A patent-pending formula called Optimized TryptoPure™ Plus has been developed that provides lysine, niacinamide, hops, ginger, and rosemary extracts to protect tryptophan against excessive degradation in our aging bodies, thus sparing it for conversion into serotonin in the brain.

Life Extension®’s Optimized TryptoPure™ Plus formula contains tryptophan that is certified pure enough to be used as an active ingredient in pharmaceutical products. This premium-quality tryptophan costs more than other tryptophan raw material as it undergoes significantly more rigorous manufacturing processes to safeguard purity.

Each three-capsule serving provides 1,000 mg of certified pure tryptophan, along with the doses of lysine, niacinamide, and ginger-hops-rosemary extracts needed to protect this precious tryptophan from unwanted degradation in the body. While some people may take two to three capsules all at once before bedtime, others may choose to take one capsule on an empty stomach before each meal.

A bottle containing 90 vegetarian capsules retails for $40. If a member purchases four bottles, the price is reduced to $27 per bottle.

Each three capsule serving supplies:

<table>
<thead>
<tr>
<th>Component</th>
<th>Dosage</th>
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<tbody>
<tr>
<td>TryptoPure® L-Tryptophan (100% pure USP pharmaceutical-grade L-tryptophan)</td>
<td>1000 mg</td>
</tr>
<tr>
<td>L-Lysine (from USP pharmaceutical-grade AjiPure™ L-Lysine HCl)</td>
<td>250 mg</td>
</tr>
<tr>
<td>Proprietary TryptoPure® Plus Blend Perluxan® Hops Standardized Extract (Humulus lupulus L.) (cones), Ginger Root Standardized Extract (Zingiber officinalis) (rhizome), and Ursole™ Rosemary Standardized Extract (Rosmarinus officinalis) (leaves)</td>
<td>285 mg</td>
</tr>
<tr>
<td>Niacin (as Niacinamide)</td>
<td>66 mg</td>
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</tbody>
</table>

SAFEST TRYPTOPHAN IN THE WORLD!

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To order Optimized TryptoPure™ Plus, call 1-800-544-4440 or visit www.LifeExtension.com

Take separately from food or supplements containing protein or amino acids, especially arginine.

CAUTION: Serotonin syndrome is characterized by high levels of serotonin and symptoms like confusion, sweating, agitation, nausea, involuntary muscle contractions, and racing heartbeat. Do not take L-tryptophan if you experience these symptoms. Do not take L-tryptophan in combination with other agents that increase serotonin levels in the central nervous system. Agents that increase serotonin levels include psychiatric medications (e.g. antidepressants, lithium), migraine medications (e.g. sumatriptan), Parkinson’s disease medications (e.g. carbidopa), and dextromethorphan, an over-the-counter cough suppressant. Do not use before driving or operating heavy machinery.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Whether you’re a man or a woman, the visible effects of aging on your appearance are always the same. Skin tone eventually loses its luster. The firm, supple look of your younger years begins to fade. Your face and neck become noticeably dry and wrinkled instead of refreshed and vibrant.

Now you can combat these unsightly changes with new DNA Repair Cream by Cosmesis®.

An innovation in skin care, this new formula features teprenone and caprylic acid, two key ingredients that help restore your skin’s youthful glow.

Teprenone has a molecular structure similar to vitamin K, while caprylic acid occurs naturally in palm and coconut oils—topical ingredients dermatologists have relied on for years to help men and women enhance their skin’s appearance.

A Clinically Studied Beautifier

Teprenone is more than just a moisturizer.

It has been shown to improve a host of visible age-related changes most maturing individuals face with the passage of time.

A group of women aged 52-64 applying teprenone twice daily experienced a 45% improvement in skin tone, 56% improvement in the appearance of spots and blemishes—and visibly more moist-looking skin in all the women tested after just one month.*

Plus...

The new DNA Repair Cream also features hyaluronic acid, a compound found in high concentrations in your skin when you’re young whose levels inevitably decline over time.

Abundant in olive oil and similar to vitamin A in molecular structure, the moisturizer squalane also occurs in your skin naturally and gradually diminishes over the years.

The quenching action of red tea extract in DNA Repair Cream also lends your skin a fresher look.

Together, this novel combination of beautifiers works to replenish youthful skin appearance—and helps you stay young-looking as you grow older.

A 1 oz jar of DNA Repair Cream retails for $49. If a member buys two jars, the price is reduced to only $31.50 per jar.


To order Cosmesis DNA Repair Cream call 1-800-544-4440 or visit www.LifeExtension.com
There are three forms of vitamin K that the human body can utilize to promote arterial health and bone support.¹⁻⁸

Life Extension’s Super K with Advanced K2 Complex provides the dynamic trio of vitamin K forms in one softgel, including vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7).

Vitamin K1 is the form of vitamin K that is found in green vegetables. K1 is tightly bound to plant fiber, so only a fraction is absorbed into the bloodstream. Supplementation ensures ample K1 blood levels.

Vitamin K2 is usually found in meats, dairy, and egg yolks. Since you may be avoiding these foods for health reasons, ingesting a K2 supplement is essential. MK-4 is the most rapidly absorbed form of K2, and MK-7 boasts a very long half-life in the body, making both forms the perfect complement to any vitamin K regimen.⁹

The retail price for a bottle containing 90 softgels (three-month supply) is $26. If a member buys four bottles, the price is reduced to just $17.25 per bottle.

Super K formula provides in just one daily softgel:

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Vitamin K1</td>
<td>1000 mcg</td>
</tr>
<tr>
<td>Vitamin K2 (MK-4)</td>
<td>1000 mcg</td>
</tr>
<tr>
<td>Vitamin K2 (MK-7)</td>
<td>100 mcg</td>
</tr>
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</table>

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

Contains tree nuts (coconut).

Warning to Coumadin® (warfarin) Drug Users

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

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

References:

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Wheat: The Unhealthy Whole Grain
Flip through your parents’ or grandparents’ family albums and you’re likely to be struck by how thin everyone looks. The women probably wore size-four dresses and the men sported 32-inch waists. Overweight was something measured only by a few pounds; obesity rare. Overweight children? Almost never. Any 42-inch waists? Not here. Two-hundred-pound teenagers? Certainly not.

The women of that world didn’t exercise much at all. How many times did you see your mom put on her jogging shoes to go out for a three-mile run? Nowadays I go outdoors on any nice day and see dozens of women jogging, riding their bicycles, power walking—things we’d virtually never see 40 or 50 years ago. And yet, we’re getting fatter and fatter every year.

I am going to argue that the problem with the diet and health of most Americans is wheat—or what we are being sold that is called “wheat.”
Documented peculiar effects of wheat on humans include appetite stimulation, exposure to brain-active exorphins (the counterpart of internally derived endorphins), exaggerated blood sugar surges that trigger cycles of satiety alternating with heightened appetite, the process of glycation that underlies disease and aging, inflammatory and pH effects that erode cartilage and damage bone, and activation of disordered immune responses. A complex range of diseases results from consumption of wheat, from celiac disease—the devastating intestinal disease that develops from exposure to wheat gluten—to an assortment of neurological disorders, diabetes, heart disease, arthritis, curious rashes, and the paralyzing delusions of schizophrenia.

The sad truth is that the proliferation of wheat products in the American diet parallels the expansion of our waists. Advice to cut fat and cholesterol intake and replace the calories with whole grains that was issued by the National Heart, Lung, and Blood Institute through its National Cholesterol Education Program in 1985 coincides precisely with the start of a sharp upward climb in body weight for men and women. Ironically, 1985 also marks the year when the Centers for Disease Control and Prevention (CDC) began tracking body weight statistics, documenting the explosion in obesity and diabetes that began that very year.

So why has this seemingly benign plant that sustained generations of humans suddenly turned on us? For one thing, it is not the same grain our forebears ground into their daily bread. Wheat has changed dramatically in the past fifty years under the influence of agricultural scientists. Wheat strains have been hybridized, crossbred, and introgressed to make the wheat plant resistant to environmental conditions, such as drought, or pathogens, such as fungi. But most of all, genetic changes have been induced to increase yield per acre. Such enormous strides in yield have required drastic changes in genetic code. Such fundamental genetic changes have come at a price.

Wheat starches are the complex carbohydrates that are the darlings of dietitians. “Complex” means that the carbohydrates in wheat are composed of polymers (repeating chains) of the simple sugar, glucose. Conventional wisdom, such as that from your dietitian or the USDA, says we should all reduce our consumption of simple carbohydrates in the form of candy and soft drinks, and increase our consumption of complex carbohydrates.

Of the complex carbohydrate in wheat, 75 percent is the chain of branching glucose units, amylopectin, and 25 percent is the linear chain of glucose units, amylose. In the human gastrointestinal tract, both amylopectin and amylose are digested by the salivary and stomach enzyme amylase. Amylopectin is efficiently digested by amylase to glucose, while amylose is much less efficiently digested, some of it making its way to the colon undigested. Thus, the complex carbohydrate amylopectin is rapidly converted to glucose and absorbed into the bloodstream and, because it is most efficiently digested, is mainly responsible for wheat’s blood-sugar-increasing effect.

**Wheat: Super Carbohydrate**

People are usually shocked when I tell them that whole wheat bread increases blood sugar to a higher level than sucrose.1 Aside from some extra fiber, eating two slices of whole wheat bread is really little different, and often worse, than drinking a can of sugar-sweetened soda or eating a sugary candy bar. This information is not new. A 1981 University of Toronto study launched the concept of the glycemic index, i.e., the comparative blood sugar effects of carbohydrates: the higher the blood sugar after consuming a specific food compared to glucose, the higher the glycemic index (GI). The original study showed that the GI of white bread was 69, while the GI of whole grain bread was 72 and Shredded Wheat cereal was 67, while that of sucrose (table sugar) was 59.2 Yes, the GI of whole grain bread is higher than that of sucrose. Incidentally, the GI of a Mars Bar nougat, chocolate,
sugar, caramel, and all—is 68. That’s better than whole grain bread. The GI of a Snickers bar is 41—far better than whole grain bread.

This has important implications for body weight, since glucose is unavoidably accompanied by insulin, the hormone that allows entry of glucose into the cells of the body, converting the glucose to fat. The higher the blood glucose after consumption of food, the greater the insulin level, the more fat is deposited. This is why, say, eating a three-egg omelet that triggers no increase in glucose does not add to body fat, while two slices of whole wheat bread increases blood glucose to high levels, triggering insulin and growth of fat, particularly abdominal or deep visceral fat.

Trigger high blood sugars repeatedly and/or over sustained periods, and more fat accumulation results. The consequences of glucose-insulin-fat deposition are especially visible in the abdomen—resulting in, yes, wheat belly. The bigger your wheat belly, the poorer your response to insulin, since the deep visceral fat of the wheat belly is associated with poor responsiveness, or “resistance,” to insulin, demanding higher and higher insulin levels, a situation that cultivates diabetes. Moreover, the bigger the wheat belly in males, the more estrogen is produced by fat tissue. The bigger your wheat belly, the more inflammatory responses that are triggered: heart disease and cancer.

The extremes of blood sugar and insulin are responsible for growth of fat specifically in the visceral organs. Experienced over and over again, visceral fat accumulates, creating a fat liver, two fat kidneys, a fat pancreas, fat large and small intestines, as well as its familiar surface manifestation, a wheat belly. (Even your heart gets fat, but you can’t see this through the semi-rigid ribs.)

Visceral fat is different. It is uniquely capable of triggering a universe of inflammatory phenomena. Visceral fat filling and encircling the abdomen of the wheat belly sort is a unique, twenty-four-hour-a-day, seven-day-a-week metabolic factory. And what it produces is inflammatory signals and abnormal cytokines, or cell-to-cell hormone signal molecules, such as leptin, resistin, and tumor necrosis factor. The more visceral fat present, the greater the quantities of abnormal signals released into the bloodstream.

All body fat is capable of producing another cytokine, adiponectin, a protective molecule that reduces risk for heart disease, diabetes, and hypertension. However, as visceral fat increases, its capacity to produce protective adiponectin diminishes. The combination of lack of adiponectin along with increased leptin, tumor necrosis factor, and other inflammatory products underlies abnormal insulin responses, diabetes, hypertension, and heart disease. The list of other health conditions triggered by visceral fat is growing and now includes dementia, rheumatoid arthritis, and colon cancer. This is why waist circumference is proving to be a powerful predictor of all these conditions, as well as of mortality.

High blood insulin provokes visceral fat accumulation, the body’s means of storing excess energy. When visceral fat accumulates, the flood of inflammatory signals it produces causes tissues such as muscle and liver to respond less to insulin. This so-called insulin resistance means that the pancreas must produce greater and greater quantities of insulin to metabolize the sugars. Eventually, a vicious circle of increased insulin resistance, increased insulin production, increased deposition of visceral fat, increased insulin resistance, etc., ensues.

But you could remove wheat and an entire domino effect of changes develop: less triggering of blood sugar rises, no exorphins to drive the impulse to consume more, no initiation of the glucose-insulin cycle of appetite. And if there’s no glucose-insulin cycle, there’s little to drive appetite except genuine physiologic need for sustenance, not overindulgence. If appetite shrinks, calorie intake is reduced, visceral fat disappears, insulin resistance improves, blood sugars fall. Diabetics can become nondiabetics, prediabetics can become nonprediabetics. All the phenomena associated with poor glucose metabolism recede, including high blood pressure, inflammatory phenomena, glycation, small LDL particles, triglycerides.
If you also count the people who don’t yet meet full criteria for prediabetes but just show high after-meal blood sugars, high triglycerides, small LDL particles, and poor responsiveness to insulin (insulin resistance)—phenomena that can still lead to heart disease, cataracts, kidney disease, and eventually diabetes—you would find few people in the modern age who are not in this group, children included.

This disease is not just about being fat and having to take medications; it leads to serious complications, such as kidney failure (40 percent of all kidney failure is caused by diabetes) and limb amputation (more limb amputations are performed for diabetes than any other non-traumatic disease). We’re talking real serious.

**Pancreatic Assault and Battery**

The cost of Americans becoming obese dwarfs the sum spent on cancer. More money will be spent on health consequences of obesity than education.

The early phase of growing visceral fat and diabetes is accompanied by a 50 percent increase in pancreatic beta cells responsible for producing insulin, a physiologic adaptation to meet the enormous demands of a body that is resistant to insulin. But beta cell adaptation has limits.

High blood sugars, such as those occurring after a nice cranberry muffin provoke the phenomenon of “glucotoxicity,” actual damage to pancreatic insulin–producing beta cells that results from high blood sugars.9

The higher the blood sugar, the more damage to beta cells. The effect is progressive and starts at a glucose level of 100 mg/dL, a value many doctors call normal. After two slices of whole wheat bread with low-fat turkey breast, a typical blood glucose would be 140 to 180 mg/dL in a nondiabetic adult, more than sufficient to do away with a few precious beta cells—which are never replaced.

Your poor, vulnerable pancreatic beta cells are also damaged by the process of lipotoxicity, loss of beta cells due to increased triglycerides and fatty acids, such as those developing from repeated carbohydrate ingestion. Recall that a diet weighted toward carbohydrates results in increased VLDL particles and triglycerides that persist in both the after-meal and between-meal periods, conditions that further exacerbate lipotoxic attrition of pancreatic beta cells.

Pancreatic injury is further worsened by inflammatory phenomena, such as oxidative injury, leptin, various interleukins, and tumor necrosis factor, all resulting from the visceral fat hotbed of inflammation, all characteristic of prediabetic and diabetic states.10

Over time and repeated sucker punches from glucotoxicity, lipotoxicity, and inflammatory destruction, beta cells wither and die, gradually reducing the number of beta cells to less than 50 percent of the normal starting number.11 That’s when diabetes is irreversibly established.

Part of the prevailing standard of care to prevent and treat diabetes, a disease caused in large part by carbohydrate consumption . . . is to advise increased consumption of carbohydrates.

**Fighting Carbohydrates with Carbohydrates**

Years ago, I used the ADA diet in diabetic patients. Following the carbohydrate intake advice of the ADA, I watched patients gain weight, experience deteriorating blood glucose control and increased need for medication, and develop diabetic complications such as kidney disease and neuropathy. Ignoring ADA diet advice and cutting carbohydrate intake leads to improved blood sugar control, reduced HbA1c, dramatic weight loss, and improvement in all the metabolic messiness of diabetes such as high blood pressure and triglycerides.
The ADA advises diabetics to cut fat, reduce saturated fat, and include 45 to 60 grams of carbohydrates—preferably “healthy whole grains”—in each meal, or 135 to 180 grams of carbohydrates per day, not including snacks. It is, in essence, a fat-phobic, carbohydrate-centered diet, with 55 to 65 percent of calories from carbohydrates. If I were to sum up the views of the ADA toward diet, it would be: Go ahead and eat foods that increase blood sugar, just be sure to adjust your medication to compensate.

Reduction of carbohydrates improves blood sugar behavior, reducing the diabetic tendency. If taken to extremes, it is possible to eliminate diabetes medications in as little as six months. In some instances, I believe it is safe to call that a cure, provided excess carbohydrates don’t make their way back into the diet. Let me say that again: If sufficient pancreatic beta cells remain and have not yet been utterly decimated by long-standing glucotoxicity, lipotoxicity, and inflammation, it is entirely possible for some, if not most, prediabetics and diabetics to be cured of their condition, something that virtually never happens with conventional low-fat diets such as that advocated by the American Diabetes Association.

We might gain better understanding of the aging process if we were able to observe the effects of accelerated aging. The greater availability of glucose to the body’s tissues permits the glucose molecule to react with any protein, creating a combined glucose-protein molecule. Once AGEs form, they are irreversible and cannot be undone. They also collect in chains of molecules, forming AGE polymers that are especially disruptive. AGEs are notorious for accumulating right where they sit, forming clumps of useless debris resistant to any of the body’s digestive or cleansing processes.

Thus, AGEs result from a domino effect set in motion anytime blood glucose increases. Anywhere that glucose goes (which is virtually everywhere in the body), AGEs accumulate, stiffening arteries (atherosclerosis), clouds the lenses of the eyes (cataracts), and mucks up the neuronal connections of the brain (dementia), all found in abundance in older people. The older we get, the more AGEs can be recovered in kidneys, eyes, liver, skin, and other organs. Although we can see evidence of some AGE effects—saggy skin and wrinkles, the milky opacity of cataracts, the gnarled hands of arthritis—none are truly quantitative. AGEs nonetheless, at least in a qualitative way, identified via biopsy as well as some aspects apparent with a simple glance, yield an index of biological decay.

AGEs are useless debris that result in tissue decay as they accumulate. They provide no useful function: AGEs cannot be burned for energy, they provide no lubricating or communicating functions, they provide no assistance to nearby enzymes or hormones. Beyond effects you can see, accumulated AGEs also mean loss of the kidneys’ ability to filter blood to remove waste and retain protein, stiffening and atherosclerotic plaque accumulation in arteries, stiffness and deterioration of cartilage in joints such as the knee and hip, and loss of functional brain cells with clumps of AGE debris taking their place.

While some AGEs enter the body directly because they are found in various foods, they are also a by-product of high blood sugar (glucose), the phenomenon that defines diabetes.

The sequence of events leading to formation of AGEs goes like this: Ingest foods that increase blood glucose. The greater availability of glucose to the body’s tissues permits the glucose molecule to react with any protein, creating a combined glucose-protein molecule. Once AGEs form, they are irreversible and cannot be undone. They also collect in chains of molecules, forming AGE polymers that are especially disruptive. AGEs are notorious for accumulating right where they sit, forming clumps of useless debris resistant to any of the body’s digestive or cleansing processes.

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While some AGEs enter the body directly because they are found in various foods, they are also a by-product of high blood sugar (glucose), the phenomenon that defines diabetes.
AGEs that result from high blood sugars are responsible for most of the complications of diabetes, from neuropathy (damaged nerves leading to loss of sensation in the feet) to retinopathy (vision defects and blindness) to nephropathy (kidney disease and kidney failure). The higher the blood sugar and the longer blood sugars stay high, the more AGE products will accumulate and the more organ damage results.

AGEs form even when blood sugar is normal, though at a much lower rate compared to when blood sugar is high. AGE formation therefore characterizes normal aging of the sort that makes a sixty-year-old person look sixty years old. But the AGEs accumulated by the diabetic whose blood sugar is poorly controlled cause accelerated aging. Diabetes has therefore served as a living model for age researchers to observe the age-accelerating effects of high blood glucose. Thus, the complications of diabetes, such as atherosclerosis, kidney disease, and neuropathy, are also the diseases of aging, common in people in their sixth, seventh, and eighth decades, uncommon in younger people in their second and third decades. Diabetes therefore teaches us what happens to people when glycation occurs at a faster clip and AGEs are permitted to accumulate.

AGE formation is therefore a continuum. But while AGEs form at even normal blood glucose levels (fasting glucose 90 mg/dL or less), they form faster at higher blood sugar levels. The higher the blood glucose, the more AGEs form. There really is no level of blood glucose at which AGE formation can be expected to cease entirely.

Being nondiabetic does not mean that you will be spared such fates. AGEs accumulate in nondiabetics and wreak their age-advancing effects. All it takes is a little extra blood sugar, just a few milligrams above normal, and—voilà—you’ve got AGEs doing their dirty work and gumming up your organs. Over time, you too can develop all the conditions seen in diabetes if you have sufficient AGE accumulation.

Thus, wheat products such as your poppy seed muffin or roasted vegetable focaccia are triggers of extravagant AGE production. Wheat, because of its unique blood glucose–increasing effect, makes you age faster. Via its blood sugar/AGE-increasing effects, wheat accelerates the rate at which you develop signs of skin aging, kidney dysfunction, dementia, atherosclerosis, and arthritis.

The Great Glycation Race

There is a widely available test that, while not capable of providing an index of biological age, provides a measure of the rate of biological aging due to
glycation. Knowing how fast or slow you are glycating the proteins of your body helps you know whether biological aging is proceeding faster or slower than chronological age. Thankfully, a simple blood test can be used to gauge the ongoing rate of AGE formation: hemoglobin A1c, or HbA1c. HbA1c is a common blood test that, while usually used for the purpose of diabetes control, can also serve as a simple index of glycation.

Hemoglobin is the complex protein residing within red blood cells that is responsible for their ability to carry oxygen. Like all other proteins of the body, hemoglobin is subject to glycation, i.e., modification of the hemoglobin molecule by glucose. The reaction occurs readily and, like other AGE reactions, is irreversible. The higher the blood glucose, the greater the percentage of hemoglobin that becomes glycated.

Red blood cells have an expected life span of sixty to ninety days. Measuring the percentage of hemoglobin molecules in the blood that are glycated provides an index of how high blood glucose has ventured over the preceding sixty to ninety days, a useful tool for assessing the adequacy of blood sugar control in diabetics, or to diagnose diabetes.

A slender person with a normal insulin response who consumes a limited amount of carbohydrates will have approximately 4.0 to 4.8 percent of all hemoglobin glycated (i.e., an HbA1c of 4.0 to 4.8 percent), reflecting the unavoidable low-grade, normal rate of glycation. Diabetics commonly have 8, 9, even 12 percent or more glycated hemoglobin—twice or more the normal rate. The majority of nondiabetic Americans are somewhere in between, most living in the range of 5.0 to 6.4 percent, above the perfect range but still below the “official” diabetes threshold of 6.5 percent. In fact, an incredible 70 percent of American adults have an HbA1c between 5.0 percent and 6.9 percent. HbA1c does not have to be 6.5 percent to generate adverse health consequences. HbA1c in the “normal” range is associated with increased risk for heart attacks, cancer, and 28 percent increased mortality for every 1 percent increase in HbA1c.

That trip to the all-you-can-eat pasta bar, accompanied by a couple of slices of Italian bread and finished off with a little bread pudding, sends your blood glucose up toward 150 to 250 mg/dL for three or four hours; high glucose for a sustained period glycates hemoglobin, reflected in higher HbA1c.

HbA1c—i.e., glycated hemoglobin—therefore provides a running index of glucose control. It also reflects to what degree you are glycating body proteins beyond hemoglobin. The higher your HbA1c, the more you are also glycating the proteins in the lenses of your eyes, in kidney tissue, arteries, skin, etc. In effect, HbA1c provides an ongoing index of aging rate: The higher your HbA1c, the faster you are aging.

So HbA1c is much more than just a feedback tool for blood glucose control in diabetics. It also reflects the rate at which you are glycating other proteins of the body, the rate at which you are aging. Stay at 5 percent or less, and you are aging at the normal rate; over 5 percent, and time for you is moving faster than it should, taking you closer to the great nursing home in the sky.
References


6. Ibid.


10. Ibid.


Assert **Control** over the Calories You Eat!

Would you spend hours at the beach without wearing sunglasses and sun protection lotion? The answer should be a resounding no!

Yet most aging individuals do little to protect their bodies against the excess calories they ingest each day.

Few of us realize the deadly impact that large meals inflict. For instance, chronic overeating results in our bloodstream being bloated with glucose, insulin, and triglycerides long after a meal is finished. This occurs not only because we absorb too many calories, but also from the age-associated impairment to our internal regulators of carbohydrate and fat metabolism. This helps explain why, as we age, we tend to accumulate unwanted body weight even as we try to cut down on food intake and exercise more.

The good news is that scientists have identified documented methods to reduce the toxic damage from excess calorie intake by taking the proper nutrients before heavy meals.

**Comprehensive Calorie Management**

The Calorie Control Weight Management Formula with African Mango Irvingia is designed to be taken before the two heaviest daily meals to help neutralize the dangers of caloric excess. The ingredients were chosen based on scientific findings that age-associated fat accumulation is at least partially caused by the loss of one’s metabolic capacity to utilize ingested calories. Each scoop of this good-tasting powdered drink mix contains:

1. A proprietary fiber called LuraLean® that swells in the stomach after ingestion with water to help reduce calorie consumption. LuraLean® binds to bile acids in the small intestine and helps transport them out of the body. These bile acids otherwise facilitate the digestion and assimilation of dietary fat into the bloodstream. LuraLean® also slows the rapid emptying of ingested food into the small intestine, thereby reducing the surge of glucose entering the bloodstream. LuraLean® works better than other fibers because its own enzymes have been removed, thus sparing it from degradation in the digestive tract. This enables LuraLean® to form a stable viscous barrier to help impede calorie absorption and maintain its sponge-like activity throughout the digestive tract. In placebo-controlled studies, LuraLean® has induced weight loss along with significant reductions in fasting lipid and post-meal glucose/insulin levels.

2. A white kidney bean extract called *Phaseolus vulgaris* that inhibits the amylase enzyme in the digestive tract. *Amylase* breaks down carbohydrates that are then absorbed into the bloodstream as glucose. *Phaseolus vulgaris* has produced weight loss and abdominal fat reductions, along with significant reductions of triglycerides, in placebo-controlled trials.

3. An African plant extract called *African Mango Irvingia gabonensis* that favorably regulates leptin to decrease appetite and facilitate triglyceride removal from adipocytes; inhibits *glycerol-3-phosphate dehydrogenase* to reduce fatty acid storage in adipocytes; and up-regulates adiponectin to facilitate insulin sensitivity. Irvingia has demonstrated favorable weight loss results in placebo-controlled trials.

4. A proprietary green tea phytosome that absorbs much better into the bloodstream to boost resting metabolic rate. In a controlled clinical study, this green tea phytosome induced 30.1 pounds of weight loss on average in 90 days when combined with a reduced calorie diet.

**Life-Saving Importance of Taking Calorie Control Weight Management Formula with African Mango Irvingia Before Heavy Meals**

Once we accept the danger that each surplus calorie poses to our aging body, it becomes easy to understand the critical need to impede the absorption and effects of ingested foods by taking the Calorie Control Weight Management Formula with African Mango Irvingia before the two heaviest meals of the day.

The retail price for a one month (60-serving) supply of Calorie Control Weight Management Formula with African Mango Irvingia is $50. If a member buys four jars, the price is reduced to $33. If eight jars are purchased the member price is slashed to only $30 per jar.

Contains soybeans, tree nuts, and coconut. LuraLean® is a registered trademark of AID International LLC. This supplement should be taken in conjunction with a healthy diet and regular exercise. Results may vary.

CAUTION: Take at least two hours apart from medications. Because this product may lower blood glucose, consult your healthcare provider before taking this product if you are taking blood glucose lowering medication. Taking fiber products without adequate liquid may increase the risk of choking. Consult your healthcare provider before taking this product if you have difficulty swallowing or esophageal narrowing.

To order the Calorie Control Weight Management Formula with African Mango Irvingia, call 1-800-544-4440 or visit [www.LifeExtension.com/calorie-control](http://www.LifeExtension.com/calorie-control)
Take Control of Excess Glucose Calories with…

CinSulin®
with InSea²™ and Crominex® 3+

Cutting-Edge Support for Healthy Glucose Metabolism

Dietary carbohydrates are nearly impossible to avoid in today’s “grab-and-go” world. The result? Countless aging Americans find themselves under constant assault from excess glucose calories. Even health-conscious, active people can experience higher-than-desired blood sugar levels as they age. Life Extension® offers an enhanced, all-natural, multipronged approach called CinSulin® with InSea²™ and Crominex® 3+.

An Extract Clinically Validated by the USDA!

Excitement has been building among scientists around the world over the clinically proven power of a novel form of cinnamon to support healthy glucose metabolism. Scientists at the US Department of Agriculture have been quietly studying it for more than a decade. Government experts have been amazed by compelling in vitro results documenting its ability to induce a twenty-fold increase in sugar metabolism.

Studies in humans have proven just as impressive. In a recent double-blind, placebo-controlled clinical trial, a group of maturing individuals (average age 61) taking 500 mg per day of the cinnamon extract contained in the CinSulin® formula experienced an average decline of 12 mg/dL in fasting blood glucose after only two months. This novel cinnamon extract also produced a significant decrease in after-meal glucose spikes (an average of 32 mg/dL) after ingestion of 75 g of carbohydrates!

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
An objective of those who practice calorie restriction is to maintain fasting glucose levels around 80 mg/dL of blood and after-meal glucose spikes to no greater than 40 mg/dL. CinSulin® may help more longevity enthusiasts accomplish their glucose control objective.

Standardized for Purity and Safety
The danger with cinnamon is the presence of naturally occurring, toxic fat-soluble compounds known as aldehydes. Life Extension® has identified a highly purified “type-A” water-soluble cinnamon extract using a patented process that eliminates these dangerous toxins.

Carb Blockers from the Sea
Researchers have known of the many health benefits of seaweed extracts for years. Only recently has it come to light that a proprietary form of seaweed extract called InSea™ blocks the action of glucosidase and amylase—enzymes your body uses to break down carbohydrates into glucose, facilitating its transport into the bloodstream.

Derived from brown seaweed and bladderwrack, a single 500 mg dose of this proprietary compound triggered a 48.3% decline in after-meal blood sugar spikes in a recent double-blind, placebo-controlled trial.6

Better Glucose Absorption with Novel Chromium Complex
Chromium has long been known for its role in maintaining healthy glucose metabolism in those already within normal range. It has been optimized with standardized extract of Indian gooseberry and a proprietary form of the adaptogen shilajit. The name of this most advanced chromium complex is Crominex® 3+. The Crominex® 3+ complex helps support:

- Normal cellular glucose absorption6-10
- Healthy endothelial function11,12
- Healthy lipid and triglyceride levels13-16
- Normal cellular energy production17,18

Combined with CinSulin® and InSea™, the result is an unrivalled formula that affords optimal support for healthy glucose metabolism in aging individuals. The suggested serving of 1 vegetarian capsule of CinSulin® with InSea™ and Crominex® 3+ taken 20-30 minutes before three meals of the day supplies:

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<tr>
<td>CinSulin®</td>
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<tr>
<td>InSea2™</td>
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<tr>
<td>Chromium (as Crominex® 3+)</td>
<td>399 mcg</td>
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A bottle containing 90 vegetarian capsules of CinSulin® with InSea™ and Crominex® 3+ retails for $38. If a member buys four bottles, the price is reduced to just $25.50 per bottle. Contains rice.

For Those Who Want Only Extra Chromium
For those wishing to obtain the unique benefits of the novel chromium complex (chromium plus Indian gooseberry and shilajit), Life Extension® also now offers a standalone version of Optimized Chromium with Crominex® 3+.

A bottle containing 60 500 mcg vegetarian capsules of Optimized Chromium with Crominex® 3+ retails for $9. If a member buys four bottles, the cost is just $6 per bottle. Contains rice.

References
2. Phytomedicine. 2010 May 27.
18. Phytother Res. 2007 May;21(5):401-5.

CAUTION: Because these products may lower blood glucose, consult your healthcare provider before taking these products if you are taking blood glucose lowering medication.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
25% off at Royal Resorts® in Cancun or the Riviera Maya... and up to $250 US Resort Credit

It's time for unforgettable vacation moments and total relaxation at one of our beachfront resorts in the Mexican Caribbean. You'll be staying in a spacious and fully equipped villa that sleeps up to six people so you can bring family or friends. Enjoy Royal hospitality and a world-class collection of amenities and activities, including pools, tennis, sports and activities for all ages, restaurants, bars and free Wi-Fi. There's something for everyone!

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In Playa del Carmen: The Royal Haciendas

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Restrictions apply. Subject to availability.
Methylcobalamin is the form of vitamin B12 active in the central and peripheral nervous system.

Methylcobalamin has been shown to protect against glutamate-induced “excitotoxic” neuronal damage. For fastest absorption and utilization, hold lozenge in mouth until completely dissolved.

The Life Extension Foundation Buyers Club imports this pharmaceutical-grade methylcobalamin, the neurologically active form of vitamin B12, at remarkably low prices. Methylcobalamin lozenges come in a good-tasting vanilla flavor.

To order vanilla-flavored methylcobalamin lozenges, call 1-800-544-4440 or visit www.LifeExtension.com

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

Five Easy Steps:
1. Call 1-800-208-3444 to discuss and place your order with one of our knowledgeable health advisors. (This order form can also be faxed to 1-866-728-1050 or mailed). Online orders can also be placed at www.lifeextension.com.
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 mailed 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 Members:
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 1100 West Commercial Blvd, Ft. Lauderdale, FL 33309. We’re located at Commercial Blvd and Powerline Road, just west of I-95. For more information or directions call 954-766-8144.

**COMPREHENSIVE PANELS**

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<th>Panel Name</th>
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<tr>
<td>MALE WEIGHT LOSS PANEL (LCWLM)*</td>
<td>CBC/Chemistry Profile, PSA, Free Testosterone, Estradiol, Free T3, Free T4, C-Reactive Protein (high-sensitivity)</td>
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<td>FEMALE WEIGHT LOSS PANEL (LCWLF)*</td>
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<td>CBC/Chemistry Profile, Estradiol, Progesterone, Free Testosterone, C-Reactive Protein (high sensitivity)</td>
<td>$269</td>
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**MALE HORMONE ADD-ON PANEL (LCADDM)***

- Pregnenolone and Dihydrotestosterone (DHT)
- Progesterone and Total Estrogens

**FEMALE HORMONE ADD-ON PANEL (LCADDF)***

- Pregnenolone and Total Estrogens

**THE CBC/CHEMISTRY PROFILE (LC381822)**

OVER 40 PARAMETERS TESTED

- Total Cholesterol
- HDL Cholesterol
- LDL Cholesterol
- Triglycerides
- C-Reactive Protein

**HEMOGLOBIN A1C (HBA1C) (LC001453)**

- Hemoglobin A1C evaluates long-term blood sugar control. Serum glucose sometimes reacts with important proteins in the body rendering them nonfunctional. Since this process is known as glycation is one of the leading theories of aging, Life Extension® believes everyone should check their A1C level.

**VITAMIN D (25OH) (LC081950)**

- This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.

**FOOD SAFE ALLERGY TEST (LCM73001)**

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

**CYTOKINE PANEL (LCMCT)***

- Includes TNF-alpha, IL-6, IL-1 beta and IL-8. Cytokines are proteins that modulate the inflammatory response. This panel is used to identify elevated levels of specific cytokines.

**OMEGA SCORE™ (LCOMEGA)**

- Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.

**COQ10* (COENZYME Q10) (LC120251)**

- This test is used to check the blood level of COQ10 and will enable more precise dosing for anyone seeking to achieve and maintain high levels of this critical antioxidant.

*This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional $35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.

**This test is packaged as a kit, requiring a finger stick performed at home.**
A pituitary function test useful in evaluating adrenocortical dysfunction.

This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.

CORTISOL (LC004051)
This test is to measure adrenal function.

This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.

DHEA-SULFATE (LC04020)
This test shows if you are taking the proper amount in the body.

DIHYDROTESTOSTERONE (DHT)* (LC500142)
Measures serum concentrations of DHT.

ESTRADIOL (LC004515)
Primarily for women. Determines the proper amount in the body.

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

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

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

PROGESTERONE (LC004317)
Primarily for women. Determines the proper amount in the body.

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

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

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

The deoxypyridinoline (DPD) urine test can be used to measure bone re-absorption rates in healthy individuals and in those with enhanced risk of developing metabolic bone diseases. Deoxypyridinoline can be used to monitor therapies (which may include bisphosphonate drugs) in people diagnosed with osteoporosis.

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.

Osteocalcin is often used as a biochemical marker, or biomarker, for the bone formation process. It has been routinely observed that higher serum osteocalcin levels are relatively well correlated with bone diseases characterized by increased bone turnover, especially osteoporosis.
## Products

<table>
<thead>
<tr>
<th>AMINO ACIDS</th>
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<tbody>
<tr>
<td>Acetyl-L-Carnitine</td>
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<tr>
<td>Acetyl-L-Carnitine-Arginine</td>
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<td>Branched Chain Amino Acids</td>
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<td>D, L-Phenylalanine Capsules</td>
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<td>GABA Powder</td>
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<td>Glycine Capsules</td>
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<td>Mega L-Glutathione Capsules</td>
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<td>N-Acetyl-L-Cysteine Capsules</td>
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<td>Tryptopure® Tryptophan (Optimized)</td>
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<td>BONE &amp; JOINT HEALTH</td>
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<td>Theralec Probiotics</td>
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<td>DURK AND SANDY PRODUCTS</td>
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<td>Blast™</td>
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<td>Dual-C Inner Power™</td>
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<td>Memory Upgrade™</td>
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<td>EYE CARE</td>
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<td>Bilberry Extract</td>
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<td>Blackcurrant Freeze Dried Extract</td>
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<td>Brite Eyes III</td>
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<td>Eye Pressure Support with Mirtogenol®</td>
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<td>Overcast Polarized Sunglasses</td>
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<td>Solarshield Sunglasses</td>
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<td>Super Zeaxanthin with Lutein &amp; Meso-Zeaxanthin and C3G (Plus Astaxanthin also available)</td>
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<td>Vision Optimizer</td>
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<td>FIBER</td>
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<td>Apple Pectin Powder</td>
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<td>Fiber Food</td>
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<td>Hi-Lignan® Nutri-Flax™</td>
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<tr>
<td>WellBetX PGX® Soluble Fiber Blend</td>
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<td>FOOD</td>
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<tr>
<td>Asian Cruciferous Vegetable Soup</td>
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<td>Cruciferous Vegetable Soup</td>
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<td>HAIR CARE</td>
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<td>Dr. Proctor’s Advanced Hair Formula</td>
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<td>Dr. Proctor’s Shampoo</td>
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<td>Life Extension Shampoo and Conditioner</td>
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<td>Super-Absorbable Tocotrienols</td>
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<td>HEART HEALTH</td>
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<td>Advanced Lipid Control</td>
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<td>Aspirin (Enteric Coated)</td>
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<td>Cho-Less™</td>
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<td>D-Ribose Powder</td>
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<td>Endothelial Defense™ with Full-Spectrum Pomegranate™</td>
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<td>Fibrinogen Resist</td>
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<td>Forskolin</td>
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<td>Natural BP Management</td>
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<td>Peak ATP® with GlycoCarn®</td>
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<td>Policosanol</td>
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<td>Red Yeast Rice</td>
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<td>Super Absorbable CoQ10® with d-Limonene</td>
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<td>Super Omega-3 EPA/DHA with Sesame Lignans &amp; Olive Fruit Extract</td>
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<td>Super Ubiquinol CoQ10 with Enhanced Mitochondrial® Support</td>
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<td>Berry Complete</td>
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<td>Blueberry Extract w/Pomegranate</td>
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<td>Butterbur Extract w/Standardized Rosmarinic Acid</td>
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<td>Calcium D-Glucarate</td>
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<tr>
<td>Enhanced Berry Complete with RZD® Acai Flordax® Iron &amp; Herbs</td>
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<td>Floralix® Iron &amp; Herbs</td>
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<tr>
<td>Full-Spectrum Pomegranate™ GrapeSeed Extract with Resveratrol &amp; Pterostilbene</td>
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<td>Huperzine A with Natural Vitamin E</td>
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<td>Kyolic® Garlic Formula 105</td>
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<td>Kyolic® Reserve</td>
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<td>Meg Green Tea Extract (Decaffeinated)</td>
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<td>Resveratrol with Synergistic Grape-Berry Actives</td>
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<td>Rosmarinic Acid Extract</td>
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<td>INFLAMMATORY REACTIONS</td>
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<td>Arthro-Immune Joint Support</td>
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<td>Bromelain (Specially-coated)</td>
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<td>Omega-3 Chewables</td>
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<td>SO2Dyme™ with GLSODIn® and Wolfberry</td>
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<td>SuperCritical Omega 7™</td>
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<td>Tart Cherry</td>
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<td>Udo’s Choice Oil</td>
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<td>Boron Capsules</td>
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<td>Chromium Ultra</td>
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SKIN CARE
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermabrasion
Anti-Aging Mask
Anti-Glycation Serum
Antioxidant Rejuvenating Foot Cream
Antioxidant Rejuvenating Foot Scrub
Antioxidant Rejuvenating Hand Cream
Antioxidant Rejuvenating Hand Scrub
Anti-Redness & Blemish Lotion
Cellulite Suppress™ Formula
Corrective Clearing Mask
DermaWhey
DNA Repair Cream
Dual-Action MicroDerm Abrasion
Elastin Collagen Body Firming Lotion
Essential Plant Lipids Reparative Serum
Face Master® Platinum
Face Rejuvenating Antioxidant Cream
Enhanced FermBlock™ with Sendara™
Fine Line-Less
Hair Suppress Formula
Healing Formula All-in-One Cream
Healing Mask
Hyaluronic Facial Moisturizer
Hydrating Anti-oxidant Face Mist
Hydroderm™
Lavilin Underarm Deodorant
Lifting & Tightening Complex
Melatonin Cream
Mild Facial Cleanser
NaPCA w/Aloe Vera
Neck Rejuvenating Antioxidant Cream
New Face Solution
Peel Off Cleansing Mask
Pigment Correcting Cream
(Ultra) Rejuvenex®
Rejuvenex™ Body Lotion
Rejuvenex® Factor
Rejuvenating Serum
Resveratrol Anti-Oxidant Serum
Skin Lightening Serum
Skin Restoring Ceramides w/Lipowheat™
Skin Stem Cell Serum
Sun Protection Spray
Total Sun Protection Cream
Ultra Rejuvenex®
Ultra RejuveNight™ w/ Progesterone
Ultra RejuveNight™ w/o Progesterone
Ultra Lip Plumper
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin K Healing Cream

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

SPECIAL PURPOSE FORMULA
Anti-Alcohol Antioxidants w/HepatoProtection Complex
Bentoflavin w/Thiamine
Breast Health Formula
Butterbur Extract with Standardized Rosmarinic Acid
Chlorophyll
Chlorophyllin w/Zinc
Cleanse Smart
Coriolus Super Strength
CR Meticnic Longevity Formula
DermaVita™
Cinsulin® w/InSea™
and Cromine® 95+
EDTA
European Leg Solution Dosirom 95
Fem Dophilus
Femmenescence MacaPulse™
Flush & Be Fit
GlucoFit™
Ideal Bowl Support 299
Maitake SX-Fraction™

WEIGHT MANAGEMENT
Allii™ Refill Pack
Advanced Anti-Adipocyte Formula w/AdipoStat
Anti-Adipocyte Formula w/AdipoStat
Calorie Control Weight Management Formula
7-Keto DHEA
DHEA Complete
Fucosanthin Slim™
HCA
Integra-Lean® Irvingia
LuraLean® Caps Special Propolmannan
Particle Size
Optimized Irvingia w/Phase 3™ Calorie Control Complex
Optimized Saffron w/Satiereal®
Natural Appetite Control
Natural Glucose Absorption Control
Stevia Liquid Extract
Super CLA Blend w/Guarana and Sesame Lignans
Super CLA Blend w/Sesame Lignans
Udo’s Choice Wholesome Fast Food Blend
WellBetX PGX® Soluble Fiber Blend

PRODUCTS
Tryptopure™ L-Tryptophan
Toothpaste
The Pill Cutter and Grinder
The Capsule Filler Machine w/Beta-Sitosterol
Mitochondrial™ Support
(Water-Soluble) Pumpkin Seed Extract
Advanced Oral Hygiene
Acetyl-L-Carnitine-Arginate
Acetyl-L-Carnitine
Zinc/Vitamin C Lozenges
Vital Greens Mix
Optimized TryptoPure™ Plus
Optimized Cran-Max® with UTI
Optimized Chromium w/Crominex® 3+
OptiZinc
Sea-Iodine™
Se-Methyl L-Selenocysteine
Selenium
Super Saw Palmetto/Nettle Root Formula
Super Saw Palmetto with Beta-Sitosterol
Super Ubiquinol CoQ10 with Enhanced Super R-Lipoic Acid
Super Absorbable CoQ10™ with d-Limonene
Super Booster Softgels w/Advanced K2 Complex
Strontium
5 HTP
5-LOXIN®
Holy Basil
Natural Stress Relief
Enhanced Natural Sleep® w/o Melatonin
Dog Mix
Dr. Tung’s Tongue Cleaner
Dr. Strum’s Intensive Bone Formula
Iodial
Iron Protein Plus
Magnesium Citrate
Mineral Formula for Men
Mineral Formula for Women
Only Trace Minerals

MISCELLANEOUS
Blender
Blood Pressure Monitor Arm Cuff Medium
Cell Sensor Gauss Meter™
CR Way Edition Advanced Dietary Software
Empty Gelatin Capsules
The Capsule Filler Machine
The Pill Cutter and Grinder

MITOCHONDRIAL SUPPORT
Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arsinate
Mitochondrial Basics w/BioPQQ™
Mitochondrial Energy Optimizer w/BioPQQ™
Optimized Carnitine with GlycoCarn®
Super Absorbable CoQ10™ w/d-Limonene
Super Alpha Lipoic Acid with Biotin
Super R-Lipoic Acid
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support

MOOD RELIEF
Bioactive Milk Peptides
Holy Basil
L-Theanine
5 HTP
Enhanced Natural Sleep® w/ Melatonin
Enhanced Natural Sleep® w/o Melatonin
Natural Stress Relief
Optimized TryptoPure™ Plus
Stabilum® 200
SAMe
St. John’s Wort Extract
Tryptopure™ L-Tryptophan

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

MULTIVITAMIN
Children’s Formula Life Extension Mix
Comprehensive Nutrient Pack
Life Extension Booster
Life Extension Mix™ Capsules
Life Extension Mix™ Powder
Life Extension Mix™ Tablets
Life Extension Mix™ w/CoQ10 Capsules
Life Extension Mix™ w/o CoQ10 Tablets
Life Extension Mix™ w/Extra Niacin
Life Extension Mix™ w/Extra Niacin w/o Copper
Life Extension Mix™ w/Stevia Powder
Life Extension Mix™ w/Stevia w/o Copper Powder
Life Extension One-Per-Day
Life Extension Two-Per-Day
Super Booster Softgels w/Advanced K2 Complex
Vital Greens Mix

PET CARE
Cat Mix
Dog Mix

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

SPORTS PERFORMANCE
Creatine Capsules
Creatine Powder
Enhanced Life Extension Protein
DMG (N, N-dimethylglycine)
Inosine
L-Glutamine Capsules
L-Glutamine Powder

VITAMINS
Ascorbic Acid Powder
Ascorbyl Palmitate Capsules
B1
B12
Beta-Carotene
Biotin Capsules
Biotin Powder
Buffered Vitamin C Powder
Complete B Complex
Essential Fat-Soluble Nutrient
Folic Acid + B12
Gamma E Tocopherol w/Sesame Lignans
Gamma E Tocopherol/Tocotrienols
Inositol Capsules
Inositol Powder
Mega Lycopene Extract
Methylocobalamin
MK-7
No-Flush Niacin
Optimized Folate
PABA Capsules
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K w/Advanced K2 Complex
Tocotrienols w/Sesame Lignans
Vitamin A Nutrisorb
Vitamin B2 (Niacin) Capsules
Vitamin B6
Vitamin B12 Tablets
Vitamin C
Vitamin D
Vitamin D3
Vitamin D3 w/Sea-Iodine™
Vitamins D and K w/Sea-Iodine™
Vitamin E
Vitamin K1

WellBetX PGX® Soluble Fiber Blend
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<tr>
<td></td>
<td>Name</td>
<td>Description</td>
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<tr>
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<td>ACETYL-L-CARNITINE - 500 mg, 100 caps</td>
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<td>00449</td>
<td>Buy 4 bottles, price each</td>
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<td>ACETYL-L-CARNITINE ARGINATE - 100 caps</td>
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<tr>
<td>00788</td>
<td>Buy 4 bottles, price each</td>
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<td>ADVANCED LIPID CONTROL - 60 veg. caps</td>
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<td>01308</td>
<td>Buy 4 bottles, price each</td>
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<td>ADVANCED ORAL HYGIENE - 60 veg. mint lozenges</td>
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<tr>
<td>01300</td>
<td>Buy 4 bottles, price each</td>
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<td>AMINO - 500 mg, 30 caps</td>
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<td>ALL* REFILL PACK - 120 caps</td>
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<td>ALPHA-LIPIC ACID W/BIOTIN (SUPER) - 250 mg, 60 caps</td>
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<td>01399</td>
<td>ARGININE/ORNITHINE - 500/250, 100 caps</td>
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LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order call: 1.954.766.8433 or 1.800.544.4440

OCTOBER 2011
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**SUB-TOTAL OF COLUMN 3**

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

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<th>Item Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<td>CLA BLEND w/SESAME LIGNANS (SUPER) - 1000 mg, 120 softgels</td>
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**SUB-TOTAL OF COLUMN 4**
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Life Extension Members receive 25% off the Retail Price of all Products
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<th>Qty</th>
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<td>EYE PRESSURE SUPPORT w/MIRTGENOL® - 30 veg. caps</td>
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**SUB-TOTAL OF COLUMN 9**
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<td>Member Each</td>
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**SUB-TOTAL OF COLUMN 13**

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# Buyers Club Order Form

## To order call: 1.954.766.8433 or 1.800.544.4440

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## SUB-TOTAL OF COLUMN 18

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
HOW TO JOIN THE LIFE EXTENSION FOUNDATION®

As a member of the Life Extension Foundation®, you have the opportunity to participate in a great scientific endeavor. We are the world’s premier organization dedicated to stopping and reversing aging.

Our 30-year track record shows that we have been five to ten years ahead of conventional and alternative medicine in making new life-saving therapies available to our members.

When you join the Life Extension Foundation®, we update you on the latest published medical research by sending you FREE books. Our most impressive publication is the 1,666-page Disease Prevention and Treatment protocol book that contains novel therapies to treat 133 common diseases of aging. Disease Prevention and Treatment is the only book that combines conventional and alternative therapies in order to implement a treatment regimen for fighting the multiple processes involved in degenerative disease.

Each month, Life Extension Foundation® members receive a magazine packed with the latest medical findings from around the world. Members also can call a toll-free phone number to talk to our knowledgeable health advisors about their health issues.

If your number one priority is good health and a long life, please join our not-for-profit organization.

Four Easy Ways to Join
1. Call toll-free 1-800-544-4440
2. Go to www.lef.org
3. Fax back to 1-866-728-1050
4. Mail to: Life Extension Foundation® • PO Box 407198 Ft. Lauderdale, FL 33340-7198 • Local Number: 954-766-8433

MEMBERSHIP APPLICATION

I want to contribute to your research efforts to extend the healthy human life span. Enclosed is my first year’s membership donation of $75 to join the most elite group of longevity enthusiasts in the world. (Canadians add $7, all others outside the U.S. add $35)

Item code: MEMB1. Call for multiple year membership rates.

Name ____________________________

Address ____________________________

City __________________ ST ______ ZIP ______

Email ____________________________ Phone ____________________________

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

☐ Charge my cc: ____________________________

Card # ____________________________ Exp. ____________

GIVE THE GIFT of HEALTH, with a LIFE EXTENSION GIFT CARD!

GIVE THE LIFE-ENHANCING BENEFITS OF LIFE EXTENSION®
WITH A GIFT OF $10, $25, $50 OR $100

To order a Life Extension Gift Card for someone special, call 1-800-544-4440.

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
**Buyers Club Order Form**

**Please mail to:**
Life Extension Foundation®, Buyers Club, Inc.
P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198
Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050
Local Number: 954-766-8433

**Order online at:** [www.LifeExtension.com](http://www.LifeExtension.com)

**Life extension foundation® members only**

**Member No.**

(print membership no. for member discount)

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- I want to join the life extension foundation®.
- Enclosed is $75 for annual membership. (Canadians add $7.00, all others outside the U.S. add $35.00). Send me: Disease Prevention & Treatment Protocol Book

- **Check here for C.O.D. orders**
- **Check here for UPS Blue Label (2nd day)**
- **Check here for UPS Red Label (overnight)**

**Prices subject to change without notice. Please notify the Life Extension Foundation® of any address change.**

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### Buyers Club Order Form

**Order Subtotals**

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**Order Totals**

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C.O.D.s (Add $7 for C.O.D. orders)

Shipping

**Grand Total** (Must be in U.S. dollars)

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### Bill to Address

**Name**

**E-mail**

**Address**

**City/State/Zip-Postal Code**

**Country**

**Phone**

**Fax**

**Visa/MasterCard/American Express/Discover #**

**Exp. Date**

**Signature**

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### Ship to Address

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A Partnership in Bone Health
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Bone Health: The Inflammation Connection

Emerging evidence suggests that inflammation exerts a significant effect on bone metabolism by stimulating production of RANKL (Receptor Activator for Nuclear Factor K B Ligand), a molecule that activates osteoclasts, the cells responsible for the breakdown of bone.

Throughout life, cells known as osteoblasts construct bone matrix and fill it with calcium. At the same time, osteoclasts work just as busily to tear down and resorb bone. This fine balance is regulated by many factors.

As our bodies age, this fine balance is lost. As the relative hormone levels shift in midlife — more drastically in women than in men — the osteoclasts gain the upper hand and bone mass begins to dwindle.

Life Extension offers a proprietary comprehensive mineral formula called Bone Restore which has been designed to support healthy bone density and strength. Bone Restore provides 1200 elemental milligrams of calcium from three different forms, along with the critically important nutrients magnesium, boron, zinc, silicon, manganese and vitamin D needed for healthy bones.

An ideal bone health protocol would pair the necessary building blocks for bone remodeling with a formula that promotes a healthy and natural inflammation response.* Zyflamend, the patented herbal formula for a healthy inflammation response*, coupled with Bone Restore, a mineral formula designed to support healthy bone density and strength, is the comprehensive approach to total bone health.

Whole-Body Health Calls for Whole-Body Inflammation Response

Many people think that only joints are affected by inflammation. The truth is the body’s natural inflammation response affects everyone and every major organ system. Given the link between a healthy inflammation response and whole-body health – a source of extensive and ongoing research – a supplement strategy geared toward promoting a healthy inflammation response is as fundamental as a daily multivitamin.* Extensive research conducted within the last two decades has indicated that phytochemicals present in herbs and spices can safely and effectively promote a healthy inflammation response.*

Zyflamend* contains combinations of herbs traditionally used to promote a healthy inflammation response.* These herbs — most of which have been part of the human diet for thousands of years — are uniquely extracted to deliver the full spectrum of naturally occurring constituents.

Zyflamend is the #1-selling herbal in the U.S.* for healthy inflammation response.* It contains hundreds of bioactive constituents from ten of the most researched botanicals that promote a healthy inflammation response and provide multiple health benefits including bone health.*

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To order Zyflamend or Bone Restore, call 1-800-544-4440 or visit www.LifeExtension.com

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Are You Getting Curcumin’s Benefits?

Curcumin is the health-promoting trace compound derived from the Indian spice turmeric. But not all turmeric is alike.

The curcumin found in the vast majority of dietary supplements is derived from turmeric that is nutritionally inferior. Why? Almost all growers harvest turmeric at the point when the turmeric root turns its signature yellow color, but before it has fully matured.

The turmeric root requires more time in the ground for highly beneficial phytonutrients called curcuminoids and sesquiterpenoids to attain peak concentrations. Life Extension’s Super Bio-Curcumin® derives from turmeric that is organic, cultivated to maturity, then specially transported and processed to preserve and deliver the root’s most complete nutritional profile.

In recent studies comparing the effects of standard curcumin against turmeric extracts comparable to Super Bio-Curcumin®, researchers observed:

- Nearly twice the support for immune health.
- Approximately twice the support for inflammatory issues.
- Almost double the antioxidant support.

A separate study indicated powerful support for heart health using a comparable extract.

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Curcumin is neither absorbed nor retained well in the blood, which is another challenge facing those who wish to maximize its benefits.

The highly popular Super Bio-Curcumin® uses BCM-95®, a patented, bioenhanced preparation of curcumin. It has been shown to reach 7 times higher concentration in the blood than standard curcumin.

Absorption studies further demonstrate that just one 400 mg vegetarian capsule per day of Super Bio-Curcumin® supplies the equivalent of 2,500-2,800 mg of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of Super Bio-Curcumin® retails for $38. If a member buys 4 bottles, the price is reduced to only $26.25 per bottle.

References:

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Contains rice.

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

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Relapse rates are 90% for most addiction treatment programs. Using nutrients, hormones, and other methods, one pioneering doctor has achieved a relapse rate of just 9%.

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Startling new data reveal that omega-3 supplementation can reduce your risk of dying prematurely by as much as 85%, while protecting against a host of age-related disorders.

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