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Prevent Exercise-Induced Joint Pain

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Exclusive Report from Diabetes Conference

How Fructose Promotes Obesity

Dr. Ruth Westheimer
Advice for Any Age
**DISEASE PREVENTION and TREATMENT**

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The 2014 edition of *Disease Prevention and Treatment* could help you or someone you know overcome a chronic medical condition, or better yet, prevent it from developing in the first place.

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If you know someone who is concerned about staying healthy, or in need of better treatment for cancer, heart disease, hepatitis, etc., the 2014 edition of *Disease Prevention and Treatment* is a must for their library.

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The cover price of the 2014 edition of *Disease Prevention and Treatment* is $69.95. Until January 31, 2014, members can obtain this book for only $24.95.

To order the 2014 edition of *Disease Prevention and Treatment* for only $24.95, call 1-800-544-4440 or log on to www.LifeExtension.com.
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Maintain Macular Density

The macular pigment is composed of lutein, zeaxanthin, and meso-zeaxanthin. The density of the macula is essential to proper vision. Macular density declines naturally over time.

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The Super Zeaxanthin formula provides ingredients that have been shown to promote healthy eyesight. Just one softgel of Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G provides:

<table>
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<tr>
<th>Ingredient</th>
<th>Concentration</th>
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<tr>
<td>OptiLut®, Lutein Plus® and MZ®</td>
<td>38 mg</td>
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<td>Marigold (Tagetes erecta) extract (flower)</td>
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<td>[Free lutein equivalent 10 mg]</td>
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<td>Zeaxanthin &amp; Meso-zeaxanthin blend</td>
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<td>[Paprika (capsicum annuum) extract (fruit), OptiLut®, Lutein Plus® and MZ® Marigold Extract (flower)]</td>
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<tr>
<td>C3G (Glycinin-3-glucoside)</td>
<td>2.2 mg</td>
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<td>[from European black currant (Ribes nigrum) extract (fruit)]</td>
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The retail price for a bottle containing 60 softgels of Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G is $22. If a member buys four bottles, the price is reduced to $14.85 per bottle.

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References

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Unlike other forms of lipoic acid, Super R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels than pure R-lipoic acid. This unique sodium-R-lipoate can help you reach peak plasma concentrations within just 10-20 minutes of supplementation.

Super R-Lipoic Acid provides more of the active “R” form of lipoic acid than any other supplement.

A bottle of Super R-Lipoic Acid containing 60 vegetarian capsules retails for $49. If a member buys four bottles, the cost is only $33.75 per bottle. Each capsule contains 300 mg of stabilized, Bio-Enhanced® Super R-lipoic acid supplying 240 mg of R-lipoic acid. Suggested dose is one capsule daily.

References

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This will be a short article.

It deals with a problem suffered by about 20% of Americans.\textsuperscript{1-3} It is seen in young adults as well as the elderly and results in enormous lost productivity.\textsuperscript{1}

\textit{Life Extension} long ago published a solution to this debilitating condition, but mainstream physicians have not caught on. Some of our members have also overlooked what we previously wrote on this topic, so I’m going to make this simple and to the point.

\textbf{Irritable bowel syndrome} is a chronic disorder of the large intestine that causes belly pain, cramping, bloating, diarrhea or constipation.\textsuperscript{1,2} The “syndrome” is poorly named because it includes patients who almost never have diarrhea, but instead are unable to fully evacuate their bowels.

Backed up feces creates chronic discomfort, bloating, and pain. These individuals view diarrhea as a good event because it enables them to evacuate feces that otherwise would remain \textit{impacted} in their colon and rectal areas.

A primary cause of this type of irritable bowel syndrome is \textit{insufficient} or \textit{ineffective peristalsis}.\textsuperscript{3} This means there is either not enough colon \textit{contractile} activity or the contractile activity is disorganized and does not occur in the necessary rhythmic pattern needed to completely evacuate one’s bowels. The term \textit{peristalsis} refers to a series of organized muscle contractions that moves food through the digestive tract.\textsuperscript{4}

\textit{Insufficient peristalsis} is one of the main culprits behind much of today’s \textit{constipation} epidemic. The encouraging news is that if one drinks the proper nutrients on an empty stomach (usually first thing in the morning), a \textit{surge of peristalsis} will occur within an hour that cleans out most or all fecal matter. I will describe how easily one can implement this strategy. >
In 1983, vitamin consumers were clamoring for higher potency vitamins, but did not want to swallow a lot of pills. A book about living longer became a best-seller, and its authors advocated taking nutrients in powder form to obtain more potency at a lower cost.

Life Extension was at the forefront in offering consumers a wide variety of powdered nutrients, some that are still popular today.

The most common customer complaint was that the vitamin powders were causing diarrhea. We worked closely with these individuals to lower the dose and advised that they take the nutrient powders only after they had consumed a meal. Some were able to slowly increase the dose of nutrient powders until their bodies developed a tolerance so that diarrhea would not be a problem. Others had to switch to capsules or tablets that released more slowly in the stomach, and thus did not generate an acute wave of peristalsis caused by the powdered nutrients.

Serendipitous Discovery

Not everyone who experienced diarrhea complained. A number of members called us to state they had suffered chronic constipation most of their life, and taking these nutrient powders on an empty stomach completely cleared them out. They stated they had never felt better.

So for nearly two decades, we were recommending various nutritional “colon cleanses” to be done several times a week, always on an empty stomach to ensure more complete bowel evacuation. This approach was vindicated when published studies found that the failure rate for fiber was quite high in chronically constipated people.5-8

The medical profession and the public are rightly fearful of exposing their digestive tract to harsh synthetic laxatives on a routine basis. On the other hand, ingesting nutrients that provide systemic beneficial effects enables people to ingest low-cost vitamins, minerals, and amino acids with the intended effect of promoting peristalsis and thorough fecal evacuation.

How to Implement this Regular Colon Cleanse

There are questionable ingredients contained in synthetic and natural products that claim a “colon cleaning” effect. You don’t have to experiment with these.

By taking nutritional powder mixes containing vitamin C with magnesium and/or potassium on an empty stomach, you’re likely to see immediate results within an hour or two. Vitamin B5 powder works this way too, but the taste is not tolerable.

Some people find a flavored powder mix of arginine, vitamin B5, and a lower amount of vitamin C produces the same results as high-potency vitamin C with magnesium mix.

It is important to drink lots of water after taking these powdered nutrient mixes as they will draw water from surrounding tissues into the colon to facilitate passage of feces. By increasing the volume of water in the intestine, stools are softened, intestinal muscle contraction is stimulated, and bowel evacuation is promoted.

Until an individual dose is ascertained by trial and error, these nutrient powders will create temporary diarrhea for many users. Those with chronic constipation can learn how to dose their powdered nutrients to achieve optimal individual relief.

Promoting Rapid Intestinal Contractions

The speed of intestinal muscle contractions is a major factor in irritable bowel syndrome (IBS). Research shows that in people with diarrhea-predominant IBS, colon contractions are too fast, whereas in those who suffer constipation-predominant IBS, colon contractions are too sluggish.

A variety of nutrient powders (such as magnesium and vitamin C), when mixed with liquid and taken on an empty stomach, can promote rapid intestinal muscle contraction. The result can be immediate relief from constipation-predominant IBS.9 (Those with diarrhea-predominant IBS should avoid these powders.)
Understanding Constipation and Laxatives

Constipation develops when intestinal peristalsis is slow or not occurring at all. Feces are either temporarily or permanently trapped in the colon-rectum, in rare cases requiring surgery.

Constipation affects more women than men. The term irritable bowel syndrome describes a wide variety of intestinal ailments. This article only addresses constipation-predominate irritable bowel syndrome.

Constipation sufferers find it painful and difficult to have a bowel movement. Sometimes this is because the stool has hardened, but the underlying problem in many cases is insufficient peristalsis that can lead to long-lasting fecal impaction. Gastroenterologists are only beginning to understand this. Instead of recommending low-cost nutrients like vitamin C and magnesium powder, they are prescribing drugs like polyethylene glycol.

Polyethylene glycol (PEG) is used in both industrial manufacturing and medicine. You can find it on the shelves of most pharmacies without the need for a prescription. The question for those with unrelenting constipation is would you rather ingest an ingredient (PEG) used in detergents and organic solvents, or nutrients you may already be taking in tablet or capsule form for their health benefits? The medical establishment prefers you take polyethylene glycol (PEG).

Why Fiber Does Not Always Help

Doctors thought they had stumbled onto a great innovation when they started recommending fiber to constipated patients. Those who suffered insufficient peristalsis, however, do not always benefit from fiber. One reason that fiber fails is that it creates more fecal bulk than those with insufficient peristalsis are able to easily evacuate.

Obtaining Immediate Constipation Relief

Irritable bowel syndrome of the constipation type has several causes, but the underlying insufficient peristalsis is what this article is addressing.

Instead of reverting to chemical laxatives, the proper nutrients taken at the right time can support soft fecal consistency and induce colonic peristaltic action without serious adverse effects.

There are convenient powdered formulas available that contain magnesium and potassium mixed with ascorbic acid that induce an evacuation of bowel contents within 30-90 minutes. Depending on the person, a few teaspoons (or, in some cases, 1-2 tablespoons) of a buffered vitamin C powder can produce a powerful but safe laxative effect.

Another approach is to use several teaspoons (or 1-2 tablespoons) of vitamin C and magnesium crystals that will evacuate the bowel within 30-90 minutes if taken on an empty stomach with several glasses of water. One of these powdered formulas provides 4,500 mg of vitamin C and 250 mg of magnesium in each teaspoon. The dose needs to be individually adjusted so it will not cause day-long diarrhea.

The suggested number of times these nutritional colon cleanses be used is about three times a week. Excess use may create tolerance and require higher dosing, which may not be bad for those who benefit from the nutrients.

Nutritional laxatives such as ascorbic acid mixed with magnesium are becoming more popular with enlightened individuals who have constipation that is resistant to fiber. Yet a search on Google reveals that polyethylene...
The American Family Physician journal reported that constipation affects as many as 26% of elderly men and 34% of elderly women.19 Constipation is one of those health problems that has been related to diminished perception of quality of life.

Most individuals with uncontrolled constipation develop a variety of symptoms, ranging from large bowel pain, rectal discomfort, abdominal fullness, nausea, anorexia, and a general feeling of malaise. These people feel like they never completely evacuate their bowels. Severe chronic constipation may be accompanied by fecal impaction resulting in unexpected episodes of diarrhea, ulceration of the colon, and intestinal obstruction.20

The good news is that there are natural solutions that can provide immediate relief.

**Effervescent Vitamin C-Magnesium Crystals**

Up until now, those who chose to use healthy colon cleanses had to drink powdered mixes that were not particularly palatable. After decades of trial and error a low-cost effervescent formula consisting of vitamin C and magnesium has been developed. This effervescent formula provides 4,500 mg of vitamin C and 250 mg of magnesium in each teaspoon with lower acidity, so it’s gentler on the stomach.

Mixing one or more teaspoons in eight ounces of water and drinking it on an empty stomach, followed by additional glasses of tea, juice, or water, can provide immediate rapid relief from sluggish bowel function that causes so much discomfort.

**glycol (PEG) is the most highly recommended by the medical mainstream.**

### Epidemic of Constipation

Chronic constipation is the number one gastrointestinal complaint in the United States, particularly among the elderly.17 Constipation accounts for more than 2.5 million physician visits a year and is among the most frequent reasons for patient self-medication.17,18
In the process of achieving rapid fecal evacuation, beneficial nutrients will be ingested that are often lacking in typical Western diets.

According to one study, 68% of American adults consumed less than the recommended daily allowance of magnesium. Women with the lowest magnesium intake have a 37% greater risk of sudden cardiac death. Critics of the judicious use of nutritional laxatives fail to realize the ancillary benefits that aging humans can attain with higher intakes of vitamin C-magnesium that promote desired peristalsis and fecal consistency.

By turning this page, you can learn about a new low-cost effervescent vitamin C-magnesium crystal formula.

For longer life,

William Faloon

References

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These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Occasional constipation is one of the most frequent gastrointestinal complaints in the United States, particularly among women and the elderly. To address this issue, Life Extension® offers a dose-adjustable nutritional solution—Effervescent Vitamin C-Magnesium Crystals—to provide immediate relief from occasional constipation.

**THE PROBLEM**
A series of rhythmic muscle contractions move food through the digestive tract. But highly processed foods and a lack of quality nutrition can occasionally result in normal but temporarily ineffective movement of waste through the colon.

**NUTRITIONAL SUPPORT**
Vitamin C is an antioxidant that scavenges free radicals in the body and protects tissues from oxidative stress. Vitamin C is a vital cofactor to the formation of collagen, the connective tissue that supports arterial walls, skin, bones, and teeth.

Magnesium is a cofactor in hundreds of enzymatic processes within cells, helps maintain healthy blood pressure levels already within normal range, improves the metabolic profile, beneficially impacts insulin resistance and inflammation. Research shows many Americans do not obtain adequate magnesium in their diets.

Effervescent Vitamin C-Magnesium Crystals has been developed to help provide relief from occasional constipation.

Effervescent Vitamin C-Magnesium Crystals can be used in varying doses depending on individual need. The suggested starting dose should be one (1) level teaspoon of Effervescent Vitamin C-Magnesium Crystals, taken on an empty stomach, mixed in 8 ounces of water. Follow immediately with drinking 8 additional ounces of water.

Each level teaspoon (approx 6 grams) provides:
- 4,500 milligrams of vitamin C (as ascorbic acid)
- 4 milligrams of vitamin B6 (as pyridoxine hydrochloride) and
- 250 milligrams of magnesium (as magnesium carbonate)

Some people will need to take one teaspoon of Effervescent Vitamin C-Magnesium Crystals on an empty stomach up to three times a week, which may require mixing it in several glasses of water. Always follow by drinking 8 ounces of water.

A bottle of 180 grams of Life Extension® Effervescent Vitamin C-Magnesium Crystals retails for $20. If a member buys four bottles, the price is reduced to only $13.50 per bottle.
The retail price for 1 bottle of Fast Acting Liquid Melatonin is $12. If a member buys 4 bottles, the price is reduced to $8.25 a bottle. Seven drops provide about 1 mg of melatonin and there are approximately 1,180 drops in each bottle. Most people place one to two full eyedroppers under their tongues at night which provides 3 to 6 mg of melatonin.

The consequences of sleep deprivation go far beyond fatigue and diminished performance. Sleep deprivation can impact the immune system, the nervous system, memory and cognitive impairment, mood, and more. Ultimately, lack of sleep leads to an overall poor quality of life.

If you’re one of the more than 20 million Americans who suffer from occasional sleep problems, you don’t have to settle for frustrating nights of tossing and turning.

A new, fast-acting LIQUID melatonin may enable you to…

**TAKE BACK CONTROL OF YOUR SLEEP!**

Melatonin is well known for its ability to regulate your body’s internal clock. However, as you grow older, the secretion of melatonin declines significantly as the pineal gland becomes calcified.

Fortunately, melatonin has been studied and shown to be effective for managing disturbances in circadian rhythms.

A meta-analysis of 17 studies concluded that melatonin supplementation decreases the time it takes to fall asleep while increasing sleep efficiency and total sleep duration.

In fact, melatonin has been shown to increase the speed of falling asleep—and the quality of sleep—in about 60% of people who use it.

**NEW MELATONIN LIQUID DROPS!**

Not all people benefit from melatonin when it’s in the form of a capsule or tablet. However, some report that by applying melatonin liquid drops under their tongue at bedtime for immediate absorption, they are able to sleep better. While any kind of liquid melatonin has been reported to work, Life Extension has developed melatonin liquid drops that are completely free of sugars.

This new soothing Fast-Acting Liquid Melatonin has a great tasting natural citrus vanilla flavor and is quickly absorbed for a restful night’s sleep.

An increase in age doesn’t have to mean an increase in sleep problems. Consider making Liquid Melatonin a part of your healthy sleep program.

**WHY WE NEED SLEEP**

Decades of clinical research document that a good night’s rest supports nearly all systems of the body, including:

- Skin health and youthful appearance
- Healthy collagen formation
- Insulin levels already within normal range
- Healthy body weight
- Glucose levels already within normal range
- Blood pressure already within normal range
- Healthy cell division
- Cardiovascular health
- A good mood

**References**

1. Available at: http://www.webmd.com/sleep-disorders/features/important-sleep-habits

To order Fast Acting Liquid Melatonin, call 1-800-544-4440 or visit www.LifeExtension.com
Long-Term Night Shift Work Associated with Increased Breast Cancer Risk

The results of a Canadian study published in Occupational and Environmental Medicine reveal a significant association between long-term night shift work and a higher risk of breast cancer.* Although earlier research had uncovered a similar link among nurses, the current study demonstrates the association among members of the general population.

The researchers compared 1,134 women with breast cancer to 1,179 age-matched women who did not have the disease. Questionnaires completed by the participants provided information concerning years spent working night shifts. Approximately one-third of women in both groups reported a history of night shift work. While no association was found for women who worked night shifts from zero to 29 years, those who worked night shifts for at least 30 years had more than twice the risk of breast cancer than subjects who reported no night shift work.

Editor’s Note: While a reduction in melatonin resulting from nighttime light exposure among night shift workers is one mechanism proposed for their greater risk of breast cancer risk, the authors remark that other mechanisms, including sleep disturbances, clock gene dysregulation and lifestyle differences, could also play a role. It has also been suggested that a decrease in vitamin D production due to reduced sunlight exposure experienced by night shift workers could contribute to increased disease risk.

—D. Dye

Greater Fruit and Vegetable Intake Associated with Increased Survival

An article published recently in the American Journal of Clinical Nutrition reveals an association between increased vegetable and fruit intake and a lower risk of dying during 13 years of follow-up.*

The analysis included 38,221 participants in the Cohort of Swedish Men who were recruited between 1997 and 1998, and 33,485 women recruited from 1987 to 1990 to participate in the Swedish Mammography Cohort. Questionnaires completed upon enrollment provided data concerning diet over the previous year, alcohol intake, and other lifestyle factors.

From the beginning of 1998 through 2010, 6,803 men and 4,637 women died. In comparison with subjects who consumed the recommended five servings of fruit and vegetables per day, those who did not consume fruit or vegetables had a 53% greater risk of dying over follow-up.

Editor’s Note: When fruit and vegetable intake were analyzed separately, those who consumed no fruit lived on average 19 months less than subjects who consumed one fruit per day, and those who reported eating three or more servings of vegetables per day survived an average of 32 months longer than those who didn’t consume them.

—D. Dye


How DHA Controls Inflammation

The FASEB Journal published the discovery of researchers at Boston's Brigham & Women's Hospital and Harvard Medical School of a mechanism for docosahexaenoic acid (DHA, an omega-3 fatty acid that occurs in fish oil and algae) in reducing inflammation.*

Charles N. Serhan, PhD, and his colleagues found that human immune cells known as macrophages convert DHA to an intermediate compound labeled 13S, 14S-epoxy-maresin. “Maresins are produced by macrophages from docosahexaenoic acid (DHA) and exert potent proresolving and tissue homeostatic actions,” Dr. Serhan and his coauthors write. “Maresin 1 is the first identified maresin.”

As the result of synthesizing the intermediate molecule, they found that it promoted the conversion of macrophages from the M1 phenotype to the M2 phenotype that does not stimulate inflammation. “We hope that the results from this study will enable investigators to test the relevance of the maresin pathway in human disease,” Dr. Serhan stated.

Editor’s Note: “We’ve known for a long time that DHA tames inflammation; now, we learn exactly how DHA works: via new substances called maresins,” commented Gerald Weissmann, MD, who is The FASEB Journal’s Editor-in-Chief. “We encounter inflammation almost daily, but our body has ways of turning it off. This is an important step toward understanding exactly how this happens. You’re likely to be hearing a lot more about maresins if, or when, new therapies arise from this discovery.”

—D. Dye


Green Tea Associated with Improved Glucose Control

The results of a meta-analysis described in an article published in the American Journal of Clinical Nutrition reaffirm the benefit of drinking green tea in maintaining glucose control among individuals at risk of metabolic syndrome.*

Researchers in China selected 17 trials that included a total of 1,133 participants for their analysis. Trials were limited to those in which subjects consumed green tea or an extract of green tea for at least two weeks and had fasting glucose or insulin measured before and after treatment, in addition to other criteria. Green tea catechin content ranged from 208 to 1,207 mg per day. Of the trials selected, nine involved participants who were overweight or obese, four included diabetics, two involved subjects with borderline diabetes, and two were limited to healthy participants.

Green tea intake was shown to be significantly associated with reductions in fasting glucose, insulin, and hemoglobin A1c, a marker of long-term glucose control.

Editor’s Note: Subgroup analyses determined that fasting glucose was reduced in participants at risk of metabolic syndrome but not in healthy subjects, and that green tea consumption was beneficial only when providing a level of catechins of at least 457 mg per day. Additional analysis of data extracted from high-quality trials indicated that green tea consumption significantly reduced fasting insulin.

—D. Dye


Deficient Vitamin D Levels Result in Early Aging of Bone

In an article published in Science Translational Medicine, researchers from University Medical Center in Hamburg, Germany, and Lawrence Berkeley National Laboratory report a link between deficient levels of vitamin D and premature aging of the bone.*

Björn Busse and his associates compared bone obtained from 15 normal individuals and 15 men and women with deficient serum 25-hydroxyvitamin D3 levels of less than 20 ng/mL and bone surface osteoidosis indicating the transition to osteomalacia. The researchers found that the increase in osteoid-covered surfaces in bone derived from deficient subjects impaired the remodeling of mineralized bone tissue underneath due to isolation from osteoclasts. These areas of bone continued to age and mineralize, exhibiting the structure of older bone tissue, which is more brittle than young bone. Further testing revealed that being deficient in vitamin D increased the initiation of cracks by 31% and their growth by 22%.

Editor’s Note: “The assumption has been that the main problem with vitamin D deficiency is reduced mineralization for the creation of new bone mass, but we’ve shown that low levels of vitamin D also induce premature aging of existing bone,” stated report coauthor Robert Ritchie of Lawrence Berkeley Laboratory’s Materials Sciences Division.

—D. Dye

IN THE NEWS

INCREASED URINARY POLYPHENOLS LINKED WITH LONGER LIFE

An article published in the Journal of Nutrition reports the finding of an association between higher urinary concentrations of polyphenols measured in older men and women and a reduced risk of dying over a 12-year period. Polyphenols are compounds that occur in plants that have been found to have antioxidant, anti-inflammatory, anti-obesity, and other effects.

The study included 807 men and women enrolled in the Invecchiare in Chianti study of older adults. Dietary questionnaires administered upon enrollment provided information on polyphenol intake and total urinary polyphenols were measured in urine samples. Over 12 years of follow-up, 66 participants died of cardiovascular disease, 112 died of cancer, and 72 deaths were due to other causes. Among participants whose total urinary polyphenols were among the top one-third of participants, the adjusted risk of dying over follow-up was 30% lower than those whose levels were among the lowest third.

Editor’s Note: While no significant association with mortality was found for dietary intake of polyphenols, the authors remark that validated biomarkers such as urinary polyphenols have an advantage over self-reported intake due to their independence from the biases and errors associated with self-reporting, and they note that food composition tables used to estimate intake were incomplete, resulting in underestimation.

—D. Dye

MORE EVIDENCE FOR PROTECTIVE ROLE OF VITAMIN D AGAINST DEVELOPMENT OF UTERINE FIBROIDS

Close on the heels of a US study published in May of this year that found an association between reduced vitamin D levels and a greater risk of uterine fibroids, a study of Italian women published in the Journal of Clinical Endocrinology & Metabolism has uncovered a similar finding.

The current study age-matched each member of a group of 128 women who had at least one fibroid with two control subjects who did not have the condition. Among women with fibroids, serum 25-hydroxyvitamin D3 levels averaged 18 ng/mL, in comparison with 20.8 ng/mL in the control group. Vitamin D deficiency, defined as serum levels lower than 10 ng/mL, occurred in 15% of women with fibroids and in 7% of the controls, resulting in a 2.4 times greater risk of fibroids experienced by deficient women.

Editor’s Note: Uterine fibroids, or leiomyomas, are benign tumors that develop in or around the uterus which occur in a significant number of women. Although the majority of cases do not require treatment, the condition can result in pain, bleeding, urinary frequency, and other complications that can necessitate removal of the fibroids or, in some cases, the entire uterus.

—D. Dye

CHOLINE IMPROVES MEMORY AND ATTENTION IN RODENTS

In a collaboration between scientists from Spain, Venezuela, and England, a benefit for the B vitamin choline on attention and memory has been demonstrated in research involving rats.

Hayarelis Moreno-Gudiño and colleagues gave pregnant rats a standard diet, a diet enriched with choline, or a choline-deficient diet. Ten of the animals’ offspring were selected from each group upon reaching adulthood and tested for memory. While all of the animals were able to remember an object 24 hours after it was shown to them, those born to mothers who received extra choline during pregnancy were better able to recognize the object after 48 hours than animals born to mothers given a standard diet. Rats born to mothers provided with diets deficient in choline were unable to remember the object after two days, indicating a deleterious effect for prenatal choline deficiency on long-term memory.

Editor’s Note: In another experiment, rats were given a diet supplemented with choline or an unsupplemented standard diet for 12 weeks prior to undergoing tests of attention. Rats that received the choline-enriched diet maintained better attention than the control group when presented a familiar stimulus and demonstrated an improvement in learning.

—D. Dye

INCREASED URINARY POLYPHENOLS LINKED WITH LONGER LIFE


* Behav Brain Res. 2013 Apr 15; 243:278-85.

* J Clin Endocrinol Metab. 2013 Jul 3.
IN THE NEWS

Higher Blood Antioxidant Levels Associated with Lower Cataract Risk

The results of a meta-analysis published in the American Journal of Clinical Nutrition add evidence to a protective role for antioxidants against age-related cataracts.* Researchers at Guangzhou Medical University and Jinan University in Guangzhou, China, selected 13 studies that included a total of 18,999 participants for their analysis. The studies evaluated the risk of cataracts in association with blood levels of vitamin A, vitamin C, vitamin E, alpha-carotene, beta-carotene, lutein, zeaxanthin, lycopene, and beta-cryptoxanthin.

When comparing lowest to highest blood antioxidant levels, having a high intake of vitamin E was associated with a 25% lower risk, alpha-carotene with a 28% lower risk, lutein with a 25% reduction, and zeaxanthin with a 30% decrease in the risk of cataract. Among Asian populations, having a high vitamin A and vitamin C levels were associated with a 31% and 33% risk reduction.

Editor’s Note: In their discussion, authors Yu-Hong Cui and associates remark that the results of studies evaluating the association between cataracts and dietary antioxidant intake have been inconsistent, possibly due to the imprecise nature of self-reporting, and they note that blood levels of antioxidants may be a better marker of antioxidant status than dietary intake.

—D. Dye


North Americans Deficient in Omega-3

A presentation at the 2013 Institute of Food Technologists Annual Meeting & Expo revealed a profound lack of omega-3 polyunsaturated fatty acids in the North American diet, despite what is known of their benefits.* Physicians and their patients are being made increasingly aware of the role of omega-3 fatty acids in the prevention or reduction of inflammatory disorders and cardiovascular disease, among other conditions.

Bruce J. Holub, PhD, of the University of Guelph, along with Alex Richardson, PhD, of the University of Oxford attribute the widespread omega-3 deficiency to diets that provide little in the way of fish or seafood, which are the best food sources of the omega-3 fatty acids EPA and DHA. The average North American diet provides 200 mg EPA and/or DHA per day, which falls short of the AHA’s recommendation of 500 mg per day for healthy adults and 900 mg per day for those with cardiovascular disease.

Editor’s Note: For children, Dr. Richardson suggests 500 mg omega-3 fatty acids per day.

—D. Dye


Reduced Vitamin D Levels Associated with Infection in ICU Patients

A study published in the journal Neural Regeneration Research revealed a greater risk of deficient serum levels of vitamin D in patients who had undergone treatment at a neurosurgical intensive care unit (ICU).* Je Hoon Jeong, MD, PhD, and colleagues evaluated serum 25-hydroxyvitamin D and 1,25-dihydroxyvitamin D in 55 men and women who were hospitalized at a neurosurgical ICU. The results of blood testing for white blood cell count and neutrophil percentage indicated suspected infection in 15 patients, which was confirmed by sputum, urine, or blood bacterial culture in 10 patients.

In comparison with subjects who did not have signs of infection, serum 25-hydroxyvitamin D levels were significantly lower in both those with suspected and confirmed infection at all time points up to 28 days following admission.

Editor’s Note: The authors note that research has demonstrated a role for vitamin D in regulating normal innate and adaptive immunity, and that the active form of the vitamin has been shown to stimulate the innate immune system by elevating the production of interleukin-1 and increasing the proliferation of monocytes (a type of white blood cell).

—D. Dye

* Neural Regen Res. 2013 June;8(16):1528-34.
When Life Extension® introduced standardized green tea extract in 1993, the supplement was very expensive. As more research was published about green tea’s multifaceted benefits, more companies competed to make higher-potency extracts at lower prices.

The good news for consumers is that they can obtain high-potency standardized green tea extract capsules at a fraction of the original price.

The Life Extension Foundation Buyers Club offers 98% green tea extracts in either a lightly caffeinated or decaffeinated form. These 98% extracts are standardized to provide high potencies of critical EGCG, the most important polyphenol found in green tea.

These highly concentrated Mega Green Tea Extract Caps contain 725 mg of either lightly caffeinated or decaffeinated 98% standardized green tea extracts. The retail price for 100 vegetarian capsules of Mega Green Tea Extract is $30.

If a member buys four bottles of 725 mg Mega Green Tea Extract capsules, the price is reduced to $21 per bottle. Most people take just one capsule daily.

To order Mega Green Tea Extract, call 1-800-544-4440 or visit www.LifeExtension.com
One Smart Cup of Coffee®

In a recently published study, researchers found that those living on the Greek island of Ikaria had a healthier and longer life span due to their daily intake of strong coffee.\(^1\)

The researchers also report that the healthy endothelial function supported by coffee compounds may play a major role in this longevity effect.\(^1\)

Polyphenol-Retained Coffee

Not all coffee delivers the same powerful health benefits and longevity dividend.\(^2\)–\(^6\)

When it comes to obtaining coffee's full range of health benefits, most people aren't getting their money's worth! The reason? Most of the coffee bean's polyphenol content is destroyed during the roasting process.

Among the most beneficial of these polyphenols is chlorogenic acid, a potent inhibitor of the glucose-6-phosphatase enzyme that stimulates gluconeogenesis. (Excess gluconeogenesis results in too much glucose produced in the liver that can cause elevations of blood glucose.)

Life Extension®'s Rich Rewards® Breakfast Blend is made using a patented, 100% natural process called HealthyRoast™.\(^7\)

This process delivers a more complete nutritional profile of the coffee bean, yielding chlorogenic acid levels far greater than other premium brands—up to 87% more chlorogenic acid than conventional coffees!

Handpicked deep in the rainforests of Central America, Rich Rewards® consists exclusively of 100% USDA certified organic arabica coffee beans, gently roasted in small batches and ground for easy brewing.

Natural Flavored Options!

To make your morning cup of coffee even more enjoyable, Life Extension® now offers our Rich Rewards® Breakfast Blend Ground Coffee in two delicious flavors:

- Natural Vanilla Flavor and
- Natural Mocha Flavor

And like our regular, unflavored Rich Rewards® coffee, these flavored ground coffees are roasted using the same HealthyRoast™ process—which preserves special, naturally occurring compounds in coffee that soothe your stomach. This unique process also guarantees a higher content of healthy polyphenols.

Now those who prefer a flavored coffee—as well as those who find that ordinary coffee brands upset their stomach—can enjoy the potent longevity support that daily coffee consumption delivers!

One Smart Cup of Coffee®

Life Extension® Rich Rewards® Breakfast Blend Ground Coffee provides it all:

- Savory taste—regular coffee taste or 2 natural flavored options!
- Far higher percentage of chlorogenic acid than conventional coffees!
- Certified 100% organic!
- Special, naturally occurring compounds that soothe your stomach!

A 12 oz bag of Life Extension® Rich Rewards® Breakfast Blend retail for $15. Members pay $11.25 per bag.

To order either of the natural flavored Rich Rewards® Breakfast Blend Ground Coffee options or the regular unflavored Rich Rewards® Breakfast Blend Ground Coffee, call 1-800-544-4440 or visit www.LifeExtension.com

Item #01729

Note: Rich Rewards Breakfast Blend Antioxidant Coffee regular caffeinated (Item# 1609) and decaffeinated (Item# 1610) are still available.

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.
**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 grown with organic practices, cultivated to maturity, then specifically 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:1,2

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

A separate study indicated that an antioxidant-rich curcumin extract3 provided powerful support for heart health.

Unrivaled Potency and Absorbability with BCM-95®

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 up to 7 times higher concentration in the blood than standard curcumin.4

The graphs on this page illustrate that one 400 mg vegetarian capsule per day of Super Bio-Curcumin® supplies the equivalent of 2,500 mg of commercial curcumin supplements.

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

**References**


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.

**Bio-Curcumin®** and **BCM-95®** are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,878,373.

To order Super Bio-Curcumin®, 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.
A staggering 53 million Americans suffer from arthritis, making it the leading cause of disability in this country.¹-³

A nutritional compound has demonstrated the ability to address one of the root causes of joint pain—reducing pain and improving flexibility—with none of the side effects of typical drug treatments.⁴-⁹

Called “un-denatured type II collagen,” or “UC-II®,” this protein compound acts against the autoimmune reactions that can lead to joint pain and degeneration.⁵,⁶ UC-II® has been shown effective in previous animal and human studies of arthritis.⁴,⁷,⁹

A groundbreaking new study shows that UC-II® can reduce joint pain and improve joint flexibility even in healthy people who experience painful joints after exercise.⁴
An Underlying Cause of Osteoarthritis

While the term “arthritis” can be used to describe several different conditions, the two most common forms are osteoarthritis and rheumatoid arthritis.10

Rheumatoid arthritis is an autoimmune disease in which the body reacts to components in joint tissue (mainly collagen) to produce inflammation, pain, and disability.10

Osteoarthritis was traditionally thought to be the result of wear and tear on the joints.10 Recent discoveries, however, have determined that osteoarthritis is accompanied by the same pro-inflammatory immune factors involved in rheumatoid arthritis.10
In both conditions, an autoimmune response is caused when the body launches an attack against collagen, the substance that makes up the bulk of the cartilage that lines your joints.\textsuperscript{10,11} Collagen is a protein critical to reducing friction and keeping joints youthful. The problem occurs when microscopic bits of collagen find their way into the bloodstream, at which point immune cells mistakenly identify them as invasive, foreign molecules.\textsuperscript{11,12}

In response to this perceived “threat,” inflammatory cytokines are released that draw in more “killer” T-cells.\textsuperscript{13} Those cells bombard exposed cartilage with toxic chemicals in order to destroy it, creating oxidative stress and further inflammation in the process.

Over time, these continuous attacks erode and disintegrate the cartilage that lubricates and functions as a shock-absorber in joints.

The resulting pain can become chronic and debilitating, and can include sensations of friction or grinding involved in joint movement. While less acute at rest, this pain is exacerbated by walking, standing, or any form of weight-bearing.\textsuperscript{3,14} Osteoarthritis sufferers often experience joint stiffness or immobility after periods of inactivity.\textsuperscript{9}

Fortunately, scientists have discovered a substance called un-denatured type II collagen, or UC-II\textsuperscript{\textregistered}, that retrains killer T-cells so that they recognize collagen as a harmless substance—preventing the joint damage seen in osteoarthritis.\textsuperscript{3,10}

Reducing Joint Pain and Swelling

UC-II\textsuperscript{\textregistered} was discovered when a team of scientists at the University of Nebraska found that chicken soup prevented the mobilization of immune system cells to sites of inflammation.\textsuperscript{15} Upon further analysis, they discovered that it was not vegetables, but a component of the chicken broth itself that exerted this anti-inflammatory activity.\textsuperscript{15}

The researchers showed that chicken-derived type II collagen functions to regulate the immune system so that it stops attacking proteins normally found in healthy joint cartilage.\textsuperscript{10}

The results have been remarkable.

In a pilot study of people with severe joint pain, a dose of 10 mg/day of this type II collagen (UC-II\textsuperscript{\textregistered}) for 42 days was shown to significantly reduce joint pain and swelling, along with morning stiffness, stiffness following periods of rest, pain that worsens with use of the affected joint, and loss of range of motion and function.\textsuperscript{10}

Follow-up studies show UC-II\textsuperscript{\textregistered} reduces joint pain and stiffness that can follow as a result of exercise.\textsuperscript{4} Even normal exercise puts stress on joints, which causes the release of collagen fragments into the bloodstream.\textsuperscript{16-19} Since these fragments are partly to blame for post-exercise pain and stiffness,\textsuperscript{16-19} supplementing with UC-II\textsuperscript{\textregistered} can prevent post-exercise pain.
Laboratory Studies

Extensive animal studies have been carried out on the effects of UC-II® in various kinds of arthritis—especially in horses and dogs, two species in which arthritis is common. After 90 days on a 10 mg dose of UC-II®, obese arthritic dogs showed significant decreases in overall pain, in pain during manipulation of a limb, and in lameness after exertion.7

Longer-term studies have shown that after taking UC-II® for 120 days, animals experienced a 62% reduction in overall pain, a 91% reduction in pain caused by limb manipulation, and a 78% reduction in exercise-associated lameness.8 No ill effects or adverse events were seen in any of these studies.

Evaluation of UC-II® in arthritic dogs has been carried out using a high-tech, piezo-electric ground force plate that measures how much weight the animal is putting on each limb and how hard the animal is able to push against the ground as it walks. These studies showed that UC-II®-supplemented dogs had significant improvements in both measurements, demonstrating a reduction in arthritis-related pain.20

Horses given UC-II® treatments experienced similar benefits. In one study, horses given placebo treatments showed no change in symptoms attributed to arthritis, while the horses given UC-II® treatments experienced an 88% reduction in overall pain and a 78% reduction in pain caused by limb manipulation.21 Again, the treatments were well tolerated and free of side effects.

Relief for Osteoarthritis Pain

Human clinical trials of UC-II® demonstrate similar effectiveness in adults suffering from osteoarthritis.9

In one study, patients with knee osteoarthritis received UC-II® or standard treatment for 90 days.9 The supplemented group experienced a 33% reduction in their osteoarthritis compared to standard therapy recipients. UC-II® reduced the patients’ self-determined pain scale scores by 40%, compared with just 15.4% in those receiving standard care. And UC-II® improved joint function by 20%, compared with 6% for usual care.

Improving Exercise-Induced Joint Pain

Of course, arthritis is just one of many causes of joint pain, which is why researchers in California recently conducted a study of oral UC-II® in healthy adults who did not have arthritis. These subjects had no knee pain at rest, but reported significant knee pain after exercise.4 The patients underwent a similar exertion test at each of 7 visits over a 120-day period.

Anti-Arthritis Vaccine

- Millions of Americans suffer from arthritis, yet medications make no real change in the course of the disease.
- Scientists have now discovered that both osteoarthritis and rheumatoid arthritis are caused when the body launches an autoimmune attack against exposed fragments of collagen.
- Un-denatured type II collagen,” or “UC-II,” is a protein supplement that acts against the autoimmune reactions that can lead to joint pain and degeneration.
- Animal and human studies convincingly demonstrate that induction of oral tolerance with UC-II® reduces pain and improves joint function in osteoarthritis and, more recently, in people without arthritis but who suffer joint pain and stiffness following exercise.
- UC-II® is safe and well tolerated; it should form part of every serious joint health program.
Compared to their performance at the beginning of the study, by days 90 and 120, the subjects that had supplemented with 40 mg UC-II® could exercise for significantly longer before experiencing joint pain; no such changes were seen in the placebo group. Supplemented subjects recovered from their joint discomfort significantly faster than the placebo recipients at days 60, 90, and 120.

The same new study evaluated joint flexibility and determined that the average knee extension was significantly greater in the UC-II® group than in the placebo group at day 120. Importantly, UC-II® recipients had significant increases in their knee extension compared to their own baseline level, with no such changes seen among placebo recipients.

In this study published in 2013, the researchers concluded that UC-II® was “more effective than placebo in supporting joint comfort, flexibility, and mobility.”

The broad-spectrum safety of UC-II® has been evaluated by a number of toxicological assays. It causes no mutations in bacterial genomes, a standard screen for carcinogenicity, and is not associated with oral toxicity.

**How it Works**

UC-II® works through something called oral tolerance, which is the desensitization of immune response to specific agents via an orally administered intervention. In this way, UC-II® reverses T-cell attacks on exposed cartilage.

This makes sense, considering that when researchers want to produce an animal model of human arthritis, they inject small quantities of collagen. The immune system responds by ramping up production of cells that react to collagen. Those cells then attack normal, healthy joint tissue, producing symptoms and signs of arthritis.

Remarkably, however, if the animals are first given a small oral dose of collagen, the incidence of experimentally induced arthritis plummets. And the severity of joint disease is reduced in the animals that do develop arthritis.

This phenomenon, called “oral tolerance,” relies on what’s known as gut-associated lymphoid tissue. Clumps of this tissue are found in the human intestinal tract; they are instrumental in “presenting” the oral collagen fragments to the immune system, which then suppresses its response to the protein.

Oral tolerance has other benefits as well, including fighting food allergies through careful exposure to the offending foods. A similar methodology is under investigation for boosting the immune response to certain cancers, especially those of the intestinal tract (mushroom extracts are used there).

Pre-treatment with UC-II®, in other words, may be inducing immune tolerance even in healthy adults, protecting them from deleterious exposure to their own cartilage.

We don’t react to our own cartilage normally because, in intact joints, there’s a barrier between blood and cartilage so that immune system cells in the blood don’t “see” cartilage proteins. In the aging joint, this protective barrier between blood and cartilage diminishes.

UC-II® offers a different approach to modifying joint inflammation rather than simply masking the symptoms.
Summary

Arthritis leads the list of conditions that cause disability among American adults.

Standard medical treatment consists mainly of treating the symptoms, with few tolerable drugs that modify the course of the disease.

A low-cost nutritional supplement has the ability to address the root cause of joint pain—reducing joint pain and improving flexibility. Called “un-denatured type II collagen,” or “UC-II®,” this natural protein supplement acts against the autoimmune reactions that can lead to joint pain and degeneration.

UC-II® has demonstrated efficacy in animal and human studies of arthritis—and can even reduce joint pain and improve joint flexibility in healthy people who experience painful joints after exercise.4

The implications cannot be overstated; the ability to move comfortably and engage in regular physical activity is critical to maintaining health in the face of our national epidemic of obesity, diabetes, and cardiovascular 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


15. Rennard BO, Ertl RF, Gossman GL, Robbins RA, Rennard SI. An experimental model of autoimmune arthritis showed that “denatured” collagen had no effect on the incidence or severity of the disease. But the specially-processed undenatured type II collagen (UC-II®) is more effective because it’s uniquely designed to preserve the 3-dimensional structure of type II collagen. Immune cells in the intestine rely on 3-D shapes to recognize and respond to the signals that turn them on or off. UC-II® provides the correct 3-D structures to intestinal immune cells, triggering the signaling required for the development of immune tolerance.

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Important Note

Not all collagen is equal in its ability to fight joint pain. There are two types of collagen: denatured collagen (collagen that’s been disrupted by heat or chemical treatment) and undenatured collagen.

An experimental model of autoimmune arthritis showed that “denatured” collagen had no effect on the incidence or severity of the disease. But the specially-processed undenatured type II collagen (UC-II®) is more effective because it’s uniquely designed to preserve the 3-dimensional structure of type II collagen. Immune cells in the intestine rely on 3-D shapes to recognize and respond to the signals that turn them on or off. UC-II® provides the correct 3-D structures to intestinal immune cells, triggering the signaling required for the development of immune tolerance.

OCTOBER 2013
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ARE YOU TAKING THE OPTIMAL FORMS OF VITAMIN E?

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

Prestigious scientific journals have highlighted gamma tocopherol as one of the most critically important forms of tocopherols, which includes d-alpha tocopherol (natural vitamin E) for those seeking optimal health benefits.

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

**SESAME LIGNANS: THE NATURAL VITAMIN E BOOSTER**

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

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

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

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

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

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

Each softgel of Gamma E Tocopherol with Sesame Lignans provides:

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
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</thead>
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<tr>
<td>Gamma tocopherol</td>
<td>197.45-269.25 mg</td>
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<tr>
<td>Delta tocopherol</td>
<td>71.8-107.7 mg</td>
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<td>Alpha tocopherol</td>
<td>30.52-43.08 mg</td>
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<td>Beta tocopherol</td>
<td>&lt;17.95 mg</td>
</tr>
<tr>
<td>Sesame seed</td>
<td>20 mg</td>
</tr>
</tbody>
</table>

(Sesamum indicum) lignan extract

Contains soybeans.

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

NOTE: Those taking Super Booster do not usually require additional gamma tocopherol.

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

References

To order Gamma E Tocopherol with Sesame Lignans, 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.
ArthroMax™ Advanced with UC-II® and AprèsFlex®

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

Two capsules of ArthroMax™ Advanced with UC-II® and AprèsFlex® provide the following nutrients in one convenient, joint-protecting formula:

- UC-II® standardized chicken cartilage 40 mg
- Glucosamine sulfate 2KCl (from corn) 1500 mg
- AprèsFlex® (Boswellia serrata) extract 100 mg
- Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®) 1.5 mg

The retail price of a bottle of 60 capsules of ArthroMax™ Advanced with UC-II® and AprèsFlex® is $36. If a member buys four bottles, the price is reduced to $24 per bottle.

References

ArtroMax™ Advanced with UC-II® and AprèsFlex®

dual-Action Support for Aging Joints!

As you grow older, age-related stiffness and discomfort in the joints becomes a fact of life. Activities once routine become a challenge as limited mobility hampers your every move.

You now have a more potent option to provide broad-spectrum support for aging joints.

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

Better Absorption for Optimum Benefit

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

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

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

To order ArthroMax™ Advanced with UC-II® and AprèsFlex®, 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.
Tender, sensitive joints can limit everyday activities. As you age and continue to put stress on your joints, you can compromise joint cartilage—which exposes small collagen fibers.

Your body’s immune system mistakenly identifies these collagen fibers as “foreign cells.” This triggers an inflammatory response against the collagen-containing cartilage in your own joints. Inflammation and joint discomfort can soon follow.

Data shows that a patented collagen provides targeted support for the immune issues related to joint discomfort. To meet this urgent need, Life Extension® offers Bio-Collagen with Patented UC-II®—a novel form of undenatured type II collagen from chicken cartilage.

Taken orally, UC-II® travels to the intestinal tract, where it “introduces” the immune system to the same type of collagen molecules found in joint cartilage.

ADVANCED MOLECULAR STRUCTURE

Not just any form of collagen will do. Normally, when chicken collagen is processed, its molecular shape is changed. It loses bioactivity and becomes denatured—which researchers found has no beneficial effect on the immune system.

Fortunately, a unique processing technique preserves the correct molecular shape of the collagen—and preserves its bioactivity—producing a form known as undenatured collagen. The result of this innovative process is an undenatured chicken collagen called Bio-Collagen with Patented UC-II®.

SCIENTIFICALLY VALIDATED

Scientific studies have found that UC-II® reduced sensitive joint discomfort and eased joint function. One double-blind, placebo-controlled study on patients found that UC-II® provided relief by 33% and decreased joint discomfort scores by a remarkable 40%—in just 90 days!

CONVENIENT ONE-PER-DAY DOSE

The suggested daily serving of one capsule of Bio-Collagen with Patented UC-II® supplies 40 mg of this proprietary blend. The retail price of a bottle of 60 capsules of Bio-Collagen with Patented UC-II® is $36. If a member buys four bottles, the price is reduced to $24 per bottle or just $12 a month.

To order Life Extension® Bio-Collagen with Patented UC-II®, call 1-800-544-4440 or visit www.LifeExtension.com

UC-II® is a registered trademark of InterHealth N.I. U.S. Patents 7,846,487; 7,083,820 and EPO patent EP 1435906B1; Canadian patent CA 2459981C; and Japanese patent JP 4800574B2.

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.
A great hoax has been perpetrated against the public’s health. A flawed analysis purported that omega-3s somehow cause prostate cancer. The media turned this faulty report into headline news stories.\(^1\)

One fact that should have immediately discredited this report was that none of the study subjects were apparently taking fish oil supplements, nor were they eating meaningful amounts of cold-water fish. Not only did the study authors admit they had no idea how the study subjects obtained their omega-3s, but the percentages of plasma omega-3s was so low that men in this study were ingesting insufficient amounts of omega-3s in their diet.\(^1\)

How does Life Extension know this? We have been testing omega-3 levels in our members for several years. In a test that measures long-term intake of omega-3s, members who take fish oil capsules score an average of 8.42%.\(^1\)

The authors of this flawed analysis did a short-term measurement of omega-3 plasma levels just one time and then followed the men for up to 9 years. Average plasma readings of 4.48% meant no prostate cancer, but if the level went up a mere fraction—to 4.66%—prostate cancer incidence supposedly soared.\(^1\)

The difference in omega-3 content (0.18%) was so trivial that it could not explain the effect on prostate cancer risk. The variance was so tiny that if a man ate salmon the night before, he could have fallen into the higher omega-3 group even if he never ate fish again over the entire multi-year course of the study.

Remarkably, the media proclaimed that 4.66% was a high level of omega-3 whereas 4.48% was a low amount. Both these levels are insufficient to achieve meaningful disease protection. As you’ll read in the meticulous rebuttal starting on the next page, there were other factors that explained why certain men in this study may have had greater prostate cancer incidence.
The media was quick to quote conventional doctors who cautioned against fish oil supplements or even eating omega-3-rich foods based on this flawed analysis. Overlooked was the low plasma levels of omega-3s showing these men were not consuming anywhere near the amounts of omega-3s they would have obtained from cold-water fish or supplements. Also discarded by critics was that a one-time plasma measurement of short-term omega-3 status had nothing to do with what these men ingested over the subsequent 6-9 years.

This may be the first report that seeks to discredit a food/supplement (omega-3s) where the human study subjects were not taking fish oil capsules or ingesting significant amounts of cold-water fish.

The tragedy is that millions of men worldwide may stop eating fish and revert to diets high in saturated fats that have been shown to be involved in the development of atherosclerosis, a leading cause of disability and death in modern societies.>
This article represents *Life Extension's* initial rebuttal to a spurious attack on omega-3s that was blown out of proportion by the media.

Several scientific studies have found a reduction in prostate cancer associated with increased omega-3 intake. A recent report purportedly showed the opposite.\(^1\)

This report was based on a single blood test of plasma fatty acids in a group of 834 men who were followed up to six years to assess prostate cancer risk (low- and high-grade disease). A smaller group of 75 men was followed up to nine years to assess only high-grade prostate cancer risk.

The results showed that slightly higher omega-3 plasma percentages from this single blood test were associated with a greater risk of low-grade (44%) and high-grade (71%) prostate cancers over the multi-year follow-up.

This report was turned into news stories with headlines blaring "Omega-3 fatty acids may raise prostate cancer risk."\(^2\)

Omitted from the media frenzy was the fact that this study was not about fish oil supplement users. The authors admitted they did not know how the study participants achieved what turned out to be very low omega-3 plasma percentages in all groups.

In fact, omega-3 plasma levels were only about 40% of what would be expected in health-conscious people taking the proper dose of fish oil.\(^1\)\(^,\)\(^1\)\(^3\) The insufficient levels of plasma omega-3s in all the study subjects were overlooked by the media. Had these very low plasma levels of omega-3s been recognized, it would have been apparent that this report had no meaning for those who boost their omega-3 consumption through diet and supplements.

Also absent from the reporting was that more men with slightly higher omega-3 plasma levels had confounding risk factors for greater risk of contracting prostate cancer at baseline, such as having higher PSA scores and a positive family history. Although the authors attempted to statistically control for some of these risk factors in their analysis, the concern remains that the baseline data was confounded and therefore the statistical analysis invalid, and that the reported results are compromised by higher rates of preexisting disease along with a genetic predisposition, not because of the minuscule variance in the amount of their plasma omega-3.

Prostate cancer sharply increases by 120 to 180% in men who have a first-degree relative who had contracted prostate cancer. Nearly double the men who contracted prostate cancer in this study had a positive family history, and although the researchers attempted to statistically control for this confounding factor, this fact was conveniently overlooked by the mainstream media as omega-3s were instead labeled the culprit.

Associating a one-time plasma omega-3 reading with long-term prostate cancer risk is ludicrous. That’s because plasma omega-3 changes rapidly with short-term dietary changes. It does not reflect long-term incorporation of omega-3 into cells and tissues. In this report, differences in baseline omega-3 blood measures were so trivial that if a man had just one salmon meal the night before, he could have wound up in the “higher” omega-3 group even if he never ingested another omega-3 again.\(^4\)

Numerous flaws in this report render its findings useless for those who supplement with purified fish oils and follow healthy dietary patterns.
Prostate cancer is a slow-developing malignancy that can take decades to manifest as clinically relevant disease. Commonly recognized risk factors for contracting prostate cancer are diet, body mass, race, family history, hormone status, and age.\textsuperscript{15,16}

An under-recognized risk factor associated with developing prostate cancer is coronary artery disease.\textsuperscript{17} We at Life Extension long ago observed that men with clogged coronary arteries often developed prostate cancer (and vice versa). A renowned prostate oncologist named Stephen Strum, MD, made a similar observation and established a common factor behind coronary heart disease and prostate cancer, i.e., bone loss.

Coronary artery disease is clearly linked with osteoporosis,\textsuperscript{18} as lack of vitamin K prevents calcium from binding to bone and instead allows it to infiltrate and harden the arteries. The ensuing bone loss results in the excessive release of bone-derived growth factors that fuel prostate cancer propagation and metastasis.

Long after Dr. Strum published his elaborate correlation, a 2012 study of 6,729 men showed coronary artery disease to be associated with a 35\% increased risk of prostate cancer.\textsuperscript{17} The reason we bring up the connection of heart disease and prostate cancer is that the authors of the controversial study apparently failed to assess overall baseline health status of the study subjects. We initially suspected that men in the higher group of plasma omega-3 (which turned out to be low by our standards) were more likely to have coronary heart disease. That’s because men with heart disease are told by their cardiologists to eat less red meat and more cold-water fish. So it would not be surprising if the plasma percentage of omega-3 was higher in men with prostate cancer as they may have been trying to eat healthier to avoid bypass surgery or a sudden heart attack.

When we asked the authors of the report if they assessed the baseline cardiovascular status of the subjects, their reply was, “No, I don’t believe this to be the case.”

Family History Predisposition

If your father or brother develops prostate cancer, your odds of getting it are about 120 to 180\% greater than if you don’t have this family history.\textsuperscript{19}

In the report attacking omega-3s, men who contracted prostate cancer had almost double the proportion of first-degree relatives with a history of prostate cancer compared with controls. Although the study authors apparently attempted to control for this baseline risk factor through the use of statistical modeling of selected variables (multivariate analysis), this confounding factor calls into question much of this report’s negative findings, but was not even mentioned in the media’s rush to create headline grabbers. Men with a family history of prostate cancer often have witnessed the long-term death spiral that prostate cancer patients suffer through. As a result, they attempt to adapt healthier lifestyles to avoid becoming a victim of their hereditary genes.

Since eating well-done red meat has long been associated with increased prostate cancer risk, men with unfavorable family histories are more likely to include at least some cold-water fish in their diets, and therefore have higher omega-3 percentage plasma levels. This does not mean the marginally higher omega-3 levels observed in this flawed analysis caused their prostate cancer.

This is partially corroborated with the data from the study participants who did not develop prostate cancer, but had higher plasma percentage levels of pro-inflammatory omega-6 fats. This indicated these individuals had little concern about what they ate since they had about half the family history rate of prostate cancer.

Fortunately there may be ways to alter family history genetic predispositions for prostate cancer by eating lots of cruciferous vegetables, maintaining youthful hormone balance, ensuring optimal vitamin D status, and taking compounds that favorably alter gene expression like metformin and curcumin.\textsuperscript{20-28}
This critical piece of data was ignored in the tabloid-like media articles that erroneously blamed the increase in prostate cancer on omega-3s.

### Baseline PSA Higher in Those Who Contracted Prostate Cancer

**Prostate specific antigen** (PSA) is a blood marker of prostate disease.

Standard laboratory reference ranges often allow PSA to reach **4.0 ng/mL** before flagging a potential problem. A more progressive view of the PSA is that any number over **2.4 ng/mL** should be viewed with suspicion, with a digital rectal exam performed and a follow-up PSA blood test done in three months.

**Life Extension** has published comprehensive articles about how to properly interpret PSA results, but to state it succinctly: Aging men with PSA readings greater than **2.4 ng/mL** are at higher risk for developing clinically relevant prostate cancer and should initiate aggressive steps to reverse the underlying process.

In the report that associated higher omega-3 blood levels with increased prostate cancer incidence, **41.1%** of the men who went on to develop prostate cancer had baseline PSA readings greater than **3.0 ng/mL**. In the group that did not develop prostate cancer, only **7.3%** has a PSA baseline reading greater than **3.0 ng/mL**.

Although the study researchers attempted to statistically control for other confounding factors in their analysis like family history, age, and education level, this PSA finding implies that many of the men who developed prostate cancer already had it (**pre-existing disease**) when the baseline **plasma omega-3** level was measured. This finding of **5.6 times** more men who developed prostate cancer with a baseline PSA level greater than **3.0 ng/mL** compared to the “no cancer” group is impossible to rationally discount. To reiterate, below is the data on the baseline PSA readings from the report the media used to discredit omega-3s:

- **7.3%** of the “No Cancer” group had PSA of ≥**3.0 ng/mL**.
- **41.1%** of the “Total Cancer” group had PSA of ≥**3.0 ng/mL**.

### Study Subjects Do Not Appear to Have Taken Fish Oil Supplements

**Life Extension** scientists repeatedly reached out to the authors of the negative report, but did not receive a response as to whether any attempt was made to ascertain the source of the omega-3 in the study subjects’ blood. We wanted to know if these men regularly ate cold-water fish or took at least some fish oil supplements.

Despite our requests, no clarification was made available by study authors as to the level of dietary supplementation with fish oil, and if so, the source of fish oil used in the study.

Based upon the very low plasma percentage levels of **omega-3 fatty acids** detected in the study, the implication is that dietary supplementation with fish oil likely did not occur. Instead, based upon the low levels of omega-3 plasma phospholipids detected, the source appears to have been primarily (potentially exclusively) diet only. As we will show soon, it appears that none of the men in this study consumed much in the way of **cold-water fish** either.

### Omega-3 Levels Were Low in All Study Subjects

You will be shocked to learn how low the average plasma percentages of **omega-3** were in all these study subjects, whether they were in the high or low rate of prostate cancer group.

Plasma phospholipid testing for fatty acids was used in this study. However, this type of fatty acid testing can vary widely depending upon short-term dietary intake. In contrast, long-term uptake by cells and tissues of the body is far less dependent upon short-term
Changes in diet. For this reason, erythrocyte (red blood cell) fatty acid indices are far better at evaluating cellular uptake over time as a result of fish ingestion and fish oil supplementation.

For example, data indicates that supplementing with about 2 grams of omega-3 fatty acids from fish oil leads to an increase in erythrocyte (red blood cell) omega-3 fatty acid percentage from about 4% at baseline to about 8% at eight weeks.13 In a case analysis conducted by Life Extension staff, a healthy diet that included fish but not fish oil supplementation resulted in an omega-3 red blood cell (RBC) equivalence level of 6.06%.

However, a standard diet supplemented with 3.6 grams of EPA/DHA from purified fish oil resulted in an omega-3 RBC equivalence level of 10.59%. Thus, compared to what can be achieved with a healthy diet alone, adding a high quality fish oil supplement can nearly double a person’s omega-3 RBC equivalence score, which is consistent with the published literature.

Therefore, if participants in the report alleging an association with fish and prostate cancer had been taking meaningful doses of fish oil supplements, their levels should have been substantially higher than what the study authors reported. Instead, for men in the prostate cancer group of this study, the percentage of plasma long-chain omega-3 fatty acids was only 4.66% ... a lower level than historic baselines taking no supplemental omega-3s.13

The numbers below should clarify this glaring flaw that renders conclusions from this report claiming fish or fish oil increases prostate cancer meaningless:

- Omega-3 RBC equivalence percentage when taking 3.6 grams/day EPA/DHA ..........10.59%
- Omega-3 RBC equivalence percentage of a moderate fish eater ..............6.06%
- Average long-chain omega-3 plasma percentage in study group with higher prostate cancer rates .................4.66%
- Average long-chain omega-3 plasma percentage in study control group (no prostate cancer) ..............4.48%

There may be no need to provide any more rebuttal than the numbers posted above. They make it clear that the average subject in their groups were consuming very little cold-water fish and certainly no meaningful fish oil supplement. Their entire study population was so negligible in omega-3 that no relevant correlation can be drawn for health conscious people today choosing omega-3-rich foods (like cold-water fish) and high-potency fish oil supplements.

Yet based on this study of men who consumed relatively no omega-3s, frenzied news reporters were advising the public to stop eating cold-water fish and avoid omega-3 supplements.

**Figure 1:** If you can’t see a difference in the two bars showing plasma percentage of omega-3s between men who contracted prostate cancer and those who did not, that’s because there is virtually no difference. The 0.18% variation could have resulted from men eating just a few ounces of fish the night before their one-time baseline blood draw. These low percentages of plasma omega-3s indicate these men were not taking fish oil supplements, nor were they eating much in the way of omega-3-rich foods in their diet.

**Virtually No Difference in Omega-3 in Men Who Developed Prostate Cancer**

When reading the frantic news reports, you would have thought the omega-3 difference in men with up to 71% increased risk of prostate cancer must have been huge.
At Life Extension, our very first reaction was that the researchers were comparing cardiac patients who gobbled down huge amounts of fish oil supplements to normal individuals who consume relatively little omega-3s. Our initial assumption was that since heart disease patients have higher prostate cancer rates, then that would explain why higher omega-3 could be mistakenly associated with increased prostate cancer risk, since heart disease patients are known to consistently take high-potencies of omega-3s through diet and supplements. How wrong our early conjecture was!

It turns out that the differences in omega-3 plasma phospholipid levels between groups were slight. In fact they were so close that we at Life Extension would classify them all as being too narrow to extrapolate meaningful data.

Our goal is to get the red blood cell (RBC) omega-3 index values in Life Extension members to 8-11% as this level was shown to offer the greatest protection against sudden myocardial infarction, yet the average quartile for plasma long-chain omega-3 fatty acids in the prostate cancer cases in the report associating fish oil with prostate cancer was only 4.66%.

Now look how narrow the difference is between men with higher prostate cancer rates. In the group whose average baseline blood draw showed 4.48% plasma long-chain omega-3 fatty acids, there was no increased prostate cancer risk. But if the omega-3 percentage average went up to 4.66% (about 1/5 of one percent), prostate cancer rates skyrocketed, according to the report’s authors.

We’re talking here of a difference of 0.18% in the percentage of plasma omega-3 fatty acids that supposedly caused a 43 to 71% increase in prostate cancer incidence. Dedicated fish oil supplement users, on the other hand, have over 100% higher omega-3 levels than seen in this study of men who apparently consumed little cold-water fish and no omega-3 supplements.

To put this into real-world perspective, the trivial difference (0.18%) in plasma omega-3 between men with no prostate cancer and those with prostate cancer could occur if a man ate just a few ounces of a cold-water fish like salmon the night before.

Remember, plasma phospholipid testing for fatty acids was used in this study. However, this type of fatty acid testing can vary widely depending upon short-term dietary intake. In contrast, long-term uptake by cells and tissues of the body is far less dependent upon short-term changes in diet. For this reason, the omega-3 RBC equivalence score is far better at evaluating cellular uptake over time as a result of fish ingestion and fish oil supplementation.

There was only one baseline blood draw. The men were followed for up to six years (low-grade and high-grade cancer), with a smaller group followed up to nine years to see who would get high-grade prostate cancer. Those who developed prostate cancer were then compared against their baseline blood draw done years earlier.

This kind of methodology is open to misinterpretation and errors even if there were large variances in omega-3 fatty acid percentages, but the 0.18% difference is so tiny that it has no relevance to aging humans who choose to include omega-3-rich foods in their diet and supplement with fish oil.

This may be the first study that seeks to discredit a food/supplement (i.e., omega-3s) where the human subjects were not even taking a fish oil supplement nor ingesting significant amounts of an omega-3 food.

A 0.18% difference in plasma omega-3 fatty acids between men who contracted prostate cancer and those who did not is infinitesimally small. To extrapolate a conclusion from this very small difference is false, misleading, and meaningless … but it did generate a lot of news headlines.

Life Extension is concerned that some men will decrease consumption of omega-3s. The result will be sharp elevations of blood triglyceride levels along with increased thrombotic, inflammatory, and atherogenic risks. An epidemic of coronary artery blockage and ischemic stroke will soon follow.
Results Are Completely Inconsistent with the Known Biology, Pathophysiology, and Biochemistry of Prostate Cancer

A fundamental aspect of quality research is consistency and repeatability.

Stated another way, for a medical finding to be considered valid, the results should not contradict well-established facts involving known biology, physiology, biochemistry, etc. Furthermore, the finding should be repeatable by other scientists.

The report attacking omega-3s is inconsistent with a variety of aspects of the well-established scientific and medical literature.

For example, upon close inspection of the data (and not simply a top-line, parroted response by the mainstream media eager to generate headlines), non-smokers had more aggressive prostate cancer, and non-drinkers (alcohol) had higher risk of prostate cancer, and prostate cancer case subjects were less likely to report a history of diabetes than controls.

Based upon these results, the implication is that men who wish to avoid prostate cancer should consume excess calories and develop diabetes, drink alcohol heavily, and abuse tobacco.

This is completely inconsistent with well-established science and utter nonsense.

In fact, numerous scientific studies show fish oil omega-3 fatty acids offer significant protective benefit for prostate health.

Fish Oil Omega-3 Fatty Acids Offer the First Line of Defense Against Prostate Cancer

In contrast to this attack on omega-3s, the scientific literature identifies diets high in omega-6 fats, trans-fatty acids, and saturated fats as associated with greater prostate cancer risk, whereas increased intake of long-chain omega-3 fats from fish has been shown to reduce risk. Based on consistent findings across a wide range of human populations, scientific research has identified why eating the wrong kinds of fatty acids provokes a stimulatory effect on prostate cancer.29,30

To ascertain what occurs after dietary fatty acids are consumed, the biochemical pathways shown on the chart below provides the answers. For example, let us assume that for dinner, you eat a steak (a source of saturated fat, as well as arachidonic acid) and a salad, along with a typical dressing rich in an omega-6 fat such as soybean or safflower oil.

Omega-6 fat readily converts to arachidonic acid in the body. As shown on the chart below, the body attempts to compensate for excess arachidonic acid through the 5-lipoxygenase (5-LOX) pathway. Multiple studies strongly show that 5-LOX enzymatic by-products like leukotriene B4 and 5-HETE directly stimulate prostate cancer cell proliferation through several well-defined mechanisms.31-36

For example, arachidonic acid is metabolized by 5-LOX to 5-hydroxyeicosatetraenoic acid (5-HETE), a potent survival factor that prostate cancer cells use
utterly inconsistent with the known pro-inflammatory effects of omega-6 fatty acids. The following studies, overlooked by the headline hungry media, show a reduction in prostate cancer in response to higher omega-3 status:

- A 2010 meta-analysis found a 63% reduction in prostate cancer death rates in those with higher fish consumption.2
- A 2004 study of 47,866 men found a trend toward decreased risk of prostate cancer with increasing levels of EPA and DHA.3
- A 2007 Harvard study of 14,916 men found lower incidence of prostate cancer in men who had higher levels of long chain omega-3 fatty acids.4
- A 2013 Harvard study of 293,464 men found increased omega-3 fatty acid intake was associated with significantly lower rate of fatal prostate cancer.5
- A 2012 Harvard study of 525 men found a 40% lower prostate cancer death rate among men with the highest intake of marine fatty acids.6
- A 2011 Duke University study found an increased omega-6:omega-3 ratio (i.e., more omega-6 and less omega-3) was associated with a significantly elevated risk of high grade prostate cancer.7
- A 1999 New Zealand study found significantly lower rates of prostate cancer with higher blood levels of EPA and DHA.8

Additional Studies Indicate Substantial Benefit with Increased Intake of Omega-3 Fatty Acids

The report attacking omega-3s conflicts with prior studies demonstrating that increased intake of omega-3 fats has been shown to reduce prostate cancer risk and diets high in omega-6 fats are associated with greater risk. This flawed analysis suggests a relationship between increased omega-6 fatty acid levels and decreased risk of prostate cancer, which is, again,
A 1999 Korean study found increased blood levels of omega-3 fatty acids associated with lower rates of prostate cancer and benign prostatic hyperplasia.9

A 2003 prospective study reported “that men with high consumption of fish had a lower risk of prostate cancer, especially for metastatic cancer.”11

A 2010 study that evaluated nutrient intake and prostate cancer risk concluded “High intake of omega-6 fatty acids, through their effects on inflammation and oxidative stress, may increase prostate cancer risk.”43

The University of Chicago conducted a study published in 2004 that showed PSA levels rose in tandem with the omega-6 to omega-3 ratio in Jamaican men whose PSA was >10 ng/mL. The researchers noted, “Increased levels of Omega-6 PUFAs and the ratio of Omega-6/Omega-3 PUFAs in Jamaican men are associated with an increased mean PSA level and risk of prostate cancer.”44

In addition to the clinical trial literature indicating consistent benefits with omega-3 fatty acid intake, traditional Japanese and Mediterranean diets rich in omega-3 fatty acids show a strong, consistent risk reduction in prostate cancer vs. Western diets rich in omega-6 and saturated fat.

Traditional Diets in Japan and The Mediterranean Region High in Fish are Protective Against Prostate Cancer

The results set forth by authors of the negative report on fish oil that omega-3 intake may be linked to prostate cancer are inconsistent, and in abject contrast, to longstanding evidence that diets high in marine lipids, such as the traditional Japanese diet and the Mediterranean diet, are protective against prostate cancer.

For example, the traditional Japanese diet, rich in omega-3 fatty acids from fish, confers protection against prostate cancer, as does the relatively high intake of fermented soy products and relatively low levels of saturated fat.45 The characteristics of the traditional Japanese diet high in soybean products, high in fish, and low in red meat are highly relevant in prostate cancer biology. In all likelihood, the traditional Japanese diet reduces the risk of prostate cancer through a combination of characteristics that generate a synergistic, anti-cancer effect (on prostate cancer.)

Likewise, the protective properties of the Mediterranean diet in relation to heart disease and prostate cancer risk are well-established. Several aspects of this dietary pattern are protective, including regular consumption of small fish (smaller fish are less likely to contain contaminants than larger predatory fish such as tuna), high olive oil intake (there is synergy between olive polyphenols and fish oil), high daily ingestion of fresh vegetables, whole fruits (not pasteurized fruit juice rich in concentrated fructose), high-fiber cereals and legumes, and low intake of saturated animal fats and red meat.46

Benefit Clearly Outweighs Risk for Fish Oil Supplementation Among Men

Overwhelming evidence currently available strongly favors fish oil supplementation for most aging humans.

Fish oil and greater marine omega-3 intake have repeatedly and consistently been shown to reduce cardiovascular risk across multiple types of studies. For example:

- A randomized, placebo-controlled trial found 1,800 mg of combined EPA plus DHA was associated with a 10% lower rate of cardiac events, 12% lower rate of non-fatal infarctions, and an almost 11% lower rate of cardiac deaths.47
- In a large intervention study, 18,000 patients were randomized to receive either a statin medication alone or a statin plus 1,800 mg of EPA-fish oil daily. After five years, those with a history of coronary artery disease had a 19% lower rate of major coronary events in the statin-plus EPA-fish oil group compared to the statin-only group.48
• A randomized, double-blind, placebo-controlled trial with chronic hemodialysis patients found that 1,700 mg of omega-3 fatty acids daily was associated with a 70% reduction in the relative risk of myocardial infarction.49

• A randomized, controlled trial using 3,300 mg of EPA and DHA (and then a decreased dosage) found a trend toward lower cardiovascular event occurrence with fish oil supplementation. Seven cardiovascular events occurred in the placebo group (not given fish oil) while only two cardiovascular events occurred in the fish oil-supplemented group during the study.50

• A meta-analysis with an average fish oil dose of 3,700 mg found lowered systolic blood pressure by an average 2.1 mmHg and diastolic by 1.6 mmHg.51

• In a randomized trial with peripheral arterial disease patients, 2,000 mg of omega-3 fatty acids daily resulted in a 49% improvement in flow-mediated dilation, a marker of endothelial cell health.52

• The GISSI-Prevenzione study (a large, randomized, controlled trial) found that 1,000 mg/day of EPA and DHA in 11,323 patients with a history of recent myocardial infarction reduced the risk of total mortality by 20% and sudden death by 45%.53,54

• The DART study — a randomized, controlled trial that examined the effects of advising 2,033 subjects to increase dietary fatty fish — revealed a 29% reduction in all-cause mortality compared with those not advised.55

• A 2009 meta-analysis of randomized, controlled trials found that dietary supplementation with omega-3 fatty acids reduced the incidence of sudden cardiac death in subjects with prior myocardial infarction.56

• Another 2009 meta-analysis of randomized, controlled trials found that dietary supplementation with omega-3 fatty acids reduced the risk of cardiovascular death, sudden cardiac death, all-cause mortality, and non-fatal cardiovascular events in patients with a history of certain cardiovascular events or risk factors.57

• A 2008 meta-analysis found a significant reduction in death from cardiac causes with fish oil supplementation.58

• A 2002 meta-analysis of randomized, controlled trials concluded that omega-3 fatty acids reduced overall mortality, mortality due to myocardial infarction, and sudden death in patients with coronary heart disease.59
Will this Flawed Report Prompt an Epidemic of Prostate Cancer?

Regrettably, the public is poorly served by relying on a sound-bite frenzied news media for health data, which often involves parading a provocative medical headline without a deep, thorough evaluation of the study’s validity.

This “science by ambush” denies an opportunity for meaningful rebuttal, since the media never wants to admit last week’s headline news story was bogus.

The average percentage difference (0.18%) of plasma long-chain omega-3 fatty acids from a single baseline test renders the study questioning the safety of omega-3s meaningless. The authors don’t even know if their study subjects were eating fish or taking fish oil supplements. We at Life Extension have criticized certain studies that solely rely on food questionnaires, but this attack on omega-3s didn’t even attempt to ascertain if study subjects were ingesting the nutrient (omega-3s) in question. Yet its authors presumptuously warn of potential risks in consuming supplemental omega-3s!

The lack of rigor, as well as multiple layers of methodological problems and errors, notwithstanding the complete lack of consistency with the known, well-established biology and biochemistry of prostate cancer, should prompt outrage in the scientific and medical community.

The danger of this deeply flawed, compromised analysis is that aging men obtaining health information through the mainstream media will cease omega-3 fatty acid ingestion.

The consequences may be profound if men shun omega-3s a result of this flawed study and follow its implied recommendations to consume more omega-6 fats, which enhance inflammation and create a better environment for prostate cancer, as well as cardiovascular disease to flourish.

Although the researchers attempted to statistically model (through multivariate analysis) and control for some (but not all) critical, confounding risk factors like family history, the higher baseline PSA readings (implying more preexisting cancers) and positive family history (1st degree male relative with prostate cancer) in men who went on to develop prostate cancer raise concerns for the integrity of the analysis results. Along with these confounding factors, the marginal difference in baseline plasma omega-3 levels of men who later developed prostate cancer cannot rationally implicate omega-3s as having a causal or causative effect. The plasma omega-3 levels of the entire study group showed consumption of omega-3 from food was inadequate and intake of meaningful fish oil supplementation non-existent.

Educated consumers should continue daily consumption of omega-3 fish oil.

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


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Milk thistle extract has long been thought of as one of nature’s most potent weapons to support human health, but until recently, the technology hasn’t been available to fully harness this plant’s potential. Among the compounds waiting to be unlocked are a slew of nourishing antioxidants and flavonolignans valued for their role in ensuring healthy liver function.1

Life Extension® has uncovered an advanced extraction technology that has enabled scientists to isolate silymarin constituents and to test their efficacy against various cell lines. Among the compounds tested, silymarin constituents isosilybin A and B proved to be the most efficient in maintaining healthy cell division.2

Certified European Milk Thistle is the first milk thistle extract to contain standardized, high potencies of silymarin, silibinins, and isosilybin A and B—providing the full spectrum of milk thistle’s liver and prostate protective compounds. Each capsule of this advanced formula provides:

Milk Thistle (Silybum marianum) Extract (seed) 750 mg
[std. to 80% Silymarin (600 mg),
30% Silibinins (225 mg),
and 8% Isosilybin A and Isosilybin B (60 mg)]

A 60 vegetarian capsule bottle of Certified European Milk Thistle retails for $34. If a member buys four bottles, the cost is reduced to only $22.50 per bottle—a savings of nearly one third!

Compare the price of Certified European Milk Thistle to commercial silymarin supplements, and members will see that this new formula is available at one of the lowest costs per milligram—with standardized concentrations of silibinins and isosilybin A and B not found in other milk thistle extracts!

Reference

*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.
SUPER OMEGA-3 WITH SESAME LIGNANS AND OLIVE FRUIT EXTRACT

To ensure the purest, most stable, and easy-to-tolerate fish oil, Super Omega-3 EPA-DHA is molecularly distilled. It enjoys the highest 5-star rating for purity, quality, and concentration from the renowned International Fish Oil Standards program. The sesame lignans not only direct the omega-3s toward more effective pathways in the body, but guard the delicate fish oil from oxidation.

A bottle containing 120 softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $22. If a member buys four bottles, the price is reduced to $21 per bottle. If 10 bottles are purchased, the cost is $18.68 per bottle. (Item #01482)

LIFE EXTENSION® MEMBERS LONG AGO BENEFITED

Starting in 2005, Life Extension members began taking a supplement (Super Omega-3) that provided potent concentrations of fish oil and olive polyphenols like hydroxytyrosol and oleuropein. This supplement also provided standardized sesame lignans to support the beneficial effect of omega-3 fatty acids in the body.

Olive oil contains polyphenol nutrients that have demonstrated wide-ranging health benefits. The recommended twice daily dose of Super Omega-3 supplies a similar polyphenol content to that found in 4 to 6 tablespoons of olive oil.

References

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

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 Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS® program conducted at Nutrasource Diagnostics, Inc.

The daily dose (four regular size softgels) of Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract provides:

- EPA (eicosapentaenoic acid) 1,400 mg
- DHA (docosahexaenoic acid) 1,000 mg
- Olive Fruit Extract (std. to 6.5% polyphenols (39 mg), 1.73% hydroxytyrosol/tyrosol (10.4 mg), 0.5% verbascoside/oleuropein (3 mg)) 600 mg
- Sesame Seed Lignan Extract 20 mg

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

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.
ALZHEIMER’S DISEASE STUDY
The Life Extension Foundation® is sponsoring a study to measure the effects of weekly injections of a study medication plus nutritional supplements that may help suppress an inflammatory factor implicated in the neuronal degeneration of Alzheimer’s disease.

If you or someone you know:
• Lives in the Fort Lauderdale, Miami, or Palm Beach area of Florida.
• Has mild to moderate Alzheimer’s disease.
• Please contact us for further information and to see if you qualify.

Qualified participants receive:
• Blood tests, evaluations, blood pressure checks, study medication, and supplements at no cost to you.
• Compensation up to $500 upon completion of the study.

OVERWEIGHT AND MILDLY ELEVATED BLOOD SUGAR STUDY
Life Extension Clinical Research, Inc. is conducting a trial to measure the effects of nutritional supplementation on blood sugar and blood vessel health.

If you or someone you know:
• Lives in the Fort Lauderdale, Miami, or Palm Beach area of Florida.
• Is overweight, 25-65 years of age, and has mildly elevated blood sugar with no previous diagnosis of diabetes.
• Please contact us for further information and to see if you qualify.

Qualified participants receive:
• Blood tests and blood vessel health evaluations at no cost to you during the trial
• Compensation of $200, a Life Extension $100 gift card and up to $50 for travel expenses upon successful completion of the trial.

REGISTER OR CONTACT US FOR MORE INFORMATION
Phone: (866) 517-4536 • Website: www.lef.org/ClinicalResearch
E-mail: LEClinicalResearch@LifeExtension.com
Ultra Natural Prostate combines cutting-edge ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.*

AprèsFlex® is an extract of *Boswellia serrata* that has two times the bioavailability of the leading boswellia extract. AprèsFlex® inhibits the enzyme 5-lipoxygenase. Boron is included because of studies showing it may help slow elevation of prostate-specific antigen (PSA).

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 is included in the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, Ultra Natural Prostate 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.

The daily dose of two softgels of Ultra Natural Prostate with AprèsFlex® and Standardized Lignans Formula provides:

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<tr>
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<tr>
<td>USPlus® Saw Palmetto (CO₂ DeepExtract™)</td>
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<td>(std to 85%-95% total fatty acids and sterols)</td>
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<tr>
<td>Graminex® Flower Pollen Extract™</td>
<td>252 mg</td>
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<tr>
<td>AprèsFlex® (Boswellia serrata) extract</td>
<td>70 mg</td>
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<tr>
<td>Pumpkin seed oil (<em>Cucurbita pepo</em> extract)</td>
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<td>(standardized to 85% total fatty acids)</td>
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<tr>
<td>Stinging and Dwarf nettle root extracts</td>
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<tr>
<td>Pygeum extract</td>
<td>100 mg</td>
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<tr>
<td>Lycopene</td>
<td>10 mg</td>
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<tr>
<td>Phytosterol complex (standardized to 26.6% free beta-sitosterol)</td>
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<tr>
<td>Proprietary blend of HMRlignan™</td>
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<tr>
<td>HMRlignan™ Norway Spruce and Flax Lignan extracts</td>
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<td>Boron</td>
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The retail price for one bottle of Ultra Natural Prostate with AprèsFlex® and Standardized Lignans 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.

To order Ultra Natural Prostate with AprèsFlex® and Standardized Lignans, 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.
The **TRUTH About Male and Female Sexual Dysfunction**

No one ever counted themselves lucky to have erectile dysfunction—but maybe they should. *Because having erectile dysfunction might just save your life.*

Erectile dysfunction (ED) is one of the earliest symptoms of coronary artery disease—showing up as a warning sign *up to three years* before a heart attack or stroke.¹

According to the *Centers for Disease Control and Prevention*, coronary artery disease kills more than 385,000 people every year.² And one shocking study reported that *men with erectile dysfunction have 8-times the risk of heart failure* over about a 2.5 year follow-up period than men without this problem.³

In addition to heart failure, sexual dysfunction can also indicate other serious, *underlying disease factors*—including neurological damage, diabetes, multiple sclerosis, and more.⁴⁻¹³

Conventional drug options generally *treat the symptoms* of sexual dysfunction—without improving the underlying causes that can lead to serious disease.¹⁴,¹⁵

The good news is that there are proven and safe *natural* therapies that *reverse the root causes* of sexual dysfunction for both men and women—reducing your risk of heart disease and increasing your life span in the process.
Sexual Dysfunction Is Not a Disease

If you judge by drug advertisements, you’d never guess that male sexual dysfunction is frequently the result of underlying health issues. These include vascular problems, prostatic disease, neurological damage, diabetes, metabolic syndrome, obesity, multiple sclerosis, and even medication side effects.3,6,8-13

Similarly—although studies of sexual dysfunction in women have lagged behind those in men16—female sexual dysfunction has also been found to be a common result of diabetes, urinary incontinence, cancer, medical or surgical treatments, and other biological factors.5,7,13,17
But these drugs work for only about half of erectile dysfunction patients, their effect is only temporary (although they can cost as much as $15 a pill), and their side effects can range from indigestion, flushing, visual disturbances, hearing loss, and headache to more serious health problems, such as neurologic disorders and heart attack.

Above all, these medications do not treat the underlying cause of erectile dysfunction, heart disease, and peripheral artery disease: chronic endothelial dysfunction.

But you don't have to rely on costly, dangerous, and often ineffective prescription drugs that only treat the symptom (erectile dysfunction) of a much larger health threat (coronary artery disease). Innovative scientists have determined three natural ingredients enhance endothelial function, and as a result simultaneously improve sexual capability and protect against heart attack and stroke.

Published research reveals how the interaction of these three natural ingredients tackles male sexual dysfunction from multiple angles.

How to Reverse Male Sexual Dysfunction

Healthy endothelial cells release nitric oxide synthase, an enzyme that catalyzes production of the chemical compound nitric oxide from the amino acid L-arginine. Nitric oxide triggers relaxation of the smooth muscle in the arteries of the penis, providing the adequate blood flow necessary to support an erection. However, dysfunctional endothelial cells, disabled by plaque buildup, can no longer produce enough nitric oxide synthase.

Fortunately, scientists have had remarkable success treating male sexual dysfunction with a nutrient blend that targets the underlying mechanisms of erectile dysfunction. This formulation includes:

- Pycnogenol®, a French maritime pine bark extract
- L-arginine aspartate, an amino acid chelate, and
- Icariin, a flavonoid compound used in Chinese herbal medicine.

Pycnogenol® and L-arginine aspartate work together to stimulate nitric oxide synthase, yielding sufficient bioactive nitric oxide to produce and maintain an erection.

Icariin further supports the ability to maintain an erection by blocking phosphodiesterase-5 (PDE5)—the enzyme responsible for causing erections to
subside. This enzyme-blocking effect mimics the primary mechanism of Viagra®—although Viagra® delivers no other benefit.

Human trials have clearly demonstrated that this nutrient blend produces a broad array of clinically proven health effects including:

- Normal erectile function
- Enhanced sperm quality and quantity
- Increased male fertility
- Higher sexual interest and greater intercourse frequency
- Enhanced sexual performance
- Increased male fertility
- Higher sexual interest and greater intercourse frequency
- Enhanced sexual performance
- Lowered blood cholesterol levels and
- Reduced blood pressure.

This combination may provide additional health benefits, because stimulation of nitric oxide is also known to:

- Act as a neurotransmitter that is involved in long-term memory
- Modulate the release of neurotransmitters
- Promote a healthy immune system and
- Play a critical role in blood clotting through its modulation of vascular tone, coagulation, and fibrinolysis.

Proven Results in Clinical Trials on Men

Multiple human studies have shown that supplementing with the components of this natural combination restores male sexual function, reverses low male fertility, and can even double the frequency of sex.

In one study, patients aged 25 to 45 who were suffering from erectile dysfunction were treated for three months with arginyl aspartate (which provided the equivalent of 1.7 grams per day of L-arginine). After one month, only 5% of patients experienced normal erections. But during the second month, 80 milligrams daily of Pycnogenol® was added to the arginine regimen, at the end of which a significant 80% of patients were experiencing normal erections. During the third month, the Pycnogenol® dose was increased to 120 milligrams daily, at the end of which a compelling 92.5% of all participants achieved normal erectile function!

Another clinical trial examined the effect of treatment with these two compounds on 50 middle-aged men suffering from erectile dysfunction. After three months, 80% of patients treated with arginyl aspartate and Pycnogenol® achieved normal erections. These results suggest that this combination may be an effective treatment for erectile dysfunction.

What You Need to Know

The Truth About Sexual Dysfunction

- Commonly afflicting both men and women, sexual dysfunction frequently signifies underlying disease factors such as cardiovascular, neurological, metabolic, and other disease pathways.
- Men with erectile dysfunction have an 8-fold greater risk of heart failure.
- For men, drug options do not treat the underlying physiological causes of sexual dysfunction. And for women, there simply are no available drug options (except for hormone replacement).
- Researchers have identified several new natural compounds that regulate the multiple underlying pathways, reversing the root causes of sexual dysfunction for both men and women—which can also help prevent chronic, age-related diseases for which sexual problems can be a warning.
- Pycnogenol®, L-arginine aspartate, and icariin have been demonstrated to safely and naturally treat male sexual dysfunction.
- Similarly, Cordyceps sinensis, maca (Lepidium meyenii), and EstroG-100® have been shown to provide safe treatments for female sexual dysfunction, and for menopausal symptoms.
men with low testosterone levels who were suffering from erectile dysfunction and poor fertility (due to impaired sperm motility and morphology). The patients took 3 grams of L-arginine aspartate, 120 milligrams of Pycnogenol®, and 120 milligrams of testosterone undecanoate daily. By the 11-month mark, 76% of the men had achieved normal sexual function—and after 12 months, sperm quality and quantity had improved to such a point that an astounding 40% (20 out of 50 patients) had achieved fertilization.39

Other clinical studies further confirmed the ability of Pycnogenol® and L-arginine aspartate to restore erectile function,34 reverse low male fertility values by improving sperm quality,38,40 and semen volume,38 and double intercourse frequency.34

Icarin (or Yin Yang Huo)—a flavonoid compound extracted from plants in the Epimedium family—is the third ingredient of this trifecta based on its ability to block the action of PDE5, the enzyme that causes erections to subside.35,48-50

In human endothelial cell culture studies, as well as in animal models, icarin has been shown to enhance the production of nitric oxide.51-53 Additionally, scientists have noted that icariin behaves similarly to testosterone—a significant feature, since testosterone is crucial for healthy sexual function.54 Animal research has shown that administration of Epimedium extracts improves erectile function in aged rats.55 Together, these multiple mechanisms of action suggest that icariin can help maintain healthy erectile function.

Potent Formula Reverses Female Sexual Dysfunction

We don’t hear much about female sexual dysfunction—mainly because there are limited guidelines pertaining to the diagnosis and treatment of the condition.56 In reality, loss of libido and other forms of sexual dysfunction plague more women than men—and sadly, 40% of affected women do not seek help from a physician.57 It wouldn’t help much if they did, because mainstream doctors have limited protocol options (other than possibly hormone replacement) for this common condition.56

Female sexual dysfunction involves the disruption of multiple physiological mechanisms—and modern medicine has no consistently safe and effective treatment that targets these various, underlying pathways.

It’s important to note the difference between disinterest and dysfunction. Preferring at times not to engage in sexual activity does not indicate a woman has female sexual dysfunction. Disinterest, or even occasional dysfunction, can be a normal response to a variety of life situations. However, many women are frustrated and depressed by complaints that include decreased libido (low desire or arousal), anorgasmia (inability to achieve orgasm), dyspareunia (painful intercourse), and urogenital atrophy (vaginal itching, soreness, dryness, and pain).58

Fortunately, recent scientific discoveries have found a solution—and it doesn’t involve taking a single prescription drug. Female sexual dysfunction can be traced to six underlying pathways that—if simultaneously regulated—result in a reversal of the full range of symptoms!

Research scientists narrowed down an extensive search of natural plants to three complementary botanical-based compounds:

- Cordyceps sinensis extract
- Lepidium meyenii (maca) extract
- EstroG-100™ three-extract blend

The combined effects of Cordyceps sinensis and maca modulate all six diverse, underlying biochemical mechanisms—restoring a woman’s normal sexual desire and function.

Also, the blend of three unique extracts known as EstroG-100™ modulates the hormonal activity behind menopausal symptoms—which are frequently the trigger for female sexual dysfunction.
The truth about sexual dysfunction

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Proven Results in Clinical Trials on Women

*Cordyceps sinensis*

Scientists have found that the active substances in the medicinal mushroom *Cordyceps sinensis* were able to improve female sexual dysfunction in just 40 days!

In a double-blind, placebo-controlled study, scientists tested the Cs-4 strain of *Cordyceps* on elderly female patients suffering from sexual dysfunction. The test group took Cordyceps Cs-4 in dosages that translate to 375 milligrams of commercially prepared product (because it is formulated as an 8:1 extract). Up to 86% of the women in the Cs-4 group significantly improved both hypoactivity signs and symptoms—in only 40 days!59

The pharmacologically active substances in extract of *Cordyceps sinensis*—derived from the Cs-4 strain of this medicinal mushroom—were found to act along 5 of 6 distinct pathways of female sexual dysfunction to:

- Balance levels of estrogen and testosterone by modulating the hypothalamus-pituitary axis (HPA)59
- Promote the downstream flow of sex hormones by optimizing adrenal function59,60
- Increase energy levels and sexual interest by supporting mitochondrial function59,61
- Promote normal vaginal lubrication and sexual function by boosting antioxidant action and inhibiting the destruction of nitric oxide,60,62 and
- Moderate inflammation by controlling levels of pro-inflammatory cytokines, thus blocking their dampening effect on sexual desire and activity.63,64

*Maca*

Studies show that an extract of *Lepidium peruvianum*, a high-altitude root plant popularly known as *maca*, can improve female sexual dysfunction in as little as six weeks!65

In a double-blind, placebo-controlled study, post-menopausal women were given either placebo or powdered *maca* that translates to 583 to 875 milligrams a day of product (because it is formulated as a 4:6:1 extract).65 Measured on a standard sexual dysfunction scale, the participants who took maca scored more than 34% lower (meaning better) than placebo subjects. They also tested 30% lower (meaning better) on a subscale of anxiety and depression symptoms—a substantial improvement in just six weeks!65

Maca works by providing the optimum balance of nutrients utilized by the body's neuroendocrine system.66 Evidence shows that this allows maca to regulate 3 of 6 different pathways of female sexual dysfunction—two of those also regulated by *Cordyceps* plus one other. Maca can:

- Modulate the hypothalamus-pituitary axis (HPA)65,67
- Regulate adrenal function,65,66 and
- Optimize levels of brain neurotransmitters—in turn reducing the risk of decreased libido, depression, and sexual dysfunction.65,69

*EstroG-100™*

The third compound contains three plant extracts: *Phlomis umbrosa*, *Cynanchum wilfordii*, and *Angelica gigas* Nakai (Korean Angelica).

When blended in correct proportions within a single formulation known as EstroG-100™, these extracts naturally and selectively regulate estrogenic activity (enhancing activity in some tissue while inhibiting it in other tissue). This in turn prevents many of the symptoms of menopause—including female sexual dysfunction.70
Scientists conducted a double-blind, placebo-controlled study of 64 women with moderate or severe menopausal symptoms. The test group was given 257 milligrams of the EstroG-100™ blend twice daily.

As a result, the average Kupperman Menopausal Index score (a measure of menopausal symptoms) decreased by 62% in the EstroG-100™ group, but only by 19% in the placebo group. And the average vaginal dryness score decreased by 59% in the treatment group versus just 27% among placebo subjects.70

These substantial menopausal and sexual improvements resulted after only 12 weeks—without weight gain or other negative effects!70

**Summary**

**Male and female sexual dysfunction** is often an indicator of underlying disease factors—including cardiovascular, neurological, metabolic, and other disease pathways. Drug options for men generally provide only short-term relief from sexual dysfunction symptoms—but do not address the underlying physi-

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**Treat the Sexual Side Effects of Antidepressants**

Adverse sexual effects—which can include loss of sexual drive, failure to reach orgasm, and erectile dysfunction—are among the most common negative effects of taking antidepressants.71,72 Men are more often affected by these sexual side effects, but women report more serious sexual symptoms.72

To offset antidepressant-related sexual dysfunction, doctors often prescribe additional medications.73-75 But these added drugs bring their own adverse reactions—and some even reverse the mood benefit of the antidepressants!77

Fortunately, a natural extract has been shown to treat sexual dysfunction—in both men and women—when it is a side effect of taking antidepressant drugs. **Scientists tested an extract of saffron on men who were experiencing sexual dysfunction as a result of their prescription antidepressant.**76

In a double-blind trial, researchers enlisted 36 married men whose symptoms of major depressive disorder had been successfully stabilized on Prozac® (fluoxetine)—but who had complaints of sexual impairment. They were randomly assigned to add to their usual dosages of Prozac®, 2 daily doses of either 15 milligrams of saffron or a placebo. Sexual function was assessed using a standard index.76

After just 4 weeks, the men in the Prozac®-plus-saffron group had experienced significantly greater improvement in erectile function and intercourse satisfaction than in the Prozac®-plus-placebo group. The team determined that saffron is a “tolerable and efficacious treatment” for male sexual dysfunction induced by Prozac®.76

**Next, scientists set out to determine if saffron could similarly offset the unwanted sexual effects experienced by women taking a prescription antidepressant.**78

A team enlisted 38 women, all of whom had major depression that had been stabilized on Prozac®—but who suffered from various types of sexual dysfunction induced by this antidepressant. In the double-blind study, half of the women were randomly assigned a supplement of 30 milligrams daily of saffron extract while the rest took a placebo. All participants continued to take their usual dosage of Prozac®, and assessments were made using the Female Sexual Function Index (FSFI).78

After 4 weeks—despite still taking the same antidepressant that had induced the unwanted sexual symptoms in the first place—women in the saffron group experienced significant improvement in total sexual function, arousal, lubrication, and pain.78
ological cause that can lead to serious disease. And women simply have no available drug options (other than hormone replacement).

Fortunately, scientists have identified several natural compounds—for both men and women—that reverse the root causes of sexual dysfunction. Proper use of these nutrients can help prevent age-related disorders for which sexual dysfunction is often an early warning sign.

In double-blind, placebo-controlled studies, Pycnogenol®, L-arginine aspartate, and icarin have been shown to be safely and naturally treat male sexual dysfunction.

Similarly, Cordyceps sinensis, maca (Lepidium meyenii), and EstroG-100™ (a three-extract blend) have been scientifically validated in placebo-controlled trials to safely treat female sexual dysfunction and to alleviate the menopausal symptoms that can trigger it.

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

16. Lindau ST, Gavrilova N. Sex, health, and years of sexually active life gained due to good health: evidence from two US population based cross sectional surveys of ageing. BMJ. 2010 Mar 9;340:c810.


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 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 $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.

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

Contains soybeans.

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

Tomat-O-Red® is a registered trademark of LycoRed, Ltd.

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.
As people age, they become more susceptible to muscle deterioration and a declining immune system. Fortunately, whey protein can have a positive impact on muscle construction and immunity due to its branched-chain amino acid profile (BCAAs) and naturally occurring lactoferrin and immunoglobins.

Unlike many commercial brands on the market, New Zealand Whey Protein Concentrate is uniquely derived from grass-fed, free range cows living healthy lives in New Zealand and not treated with Growth Hormone (rBST).

Life Extension's New Zealand Whey Protein Concentrate offers the following:

- Non-GMO Whey Protein Concentrate!
- Naturally high levels of essential branched-chain amino acids!
- High-quality muscle building protein!
- Easily mixes into water or milk!
- Great Taste! – Available in both natural chocolate and natural vanilla flavors.

The retail price for an 18.34 ounce container of New Zealand Vanilla Flavored Whey Protein Concentrate (Item # 01770) or for a 23.28 ounce container of New Zealand Chocolate Flavored Whey Protein Concentrate (Item # 01771) is $30. If a member purchases four bottles, the price is reduced to $19.95 per bottle. Contains milk.
Overlooked in the effort to support sexual function in aging men is the health of the vascular system. Blood flow through the delicate lining of the arteries (the endothelium) is essential to sexual arousal, so it should come as no surprise that endothelial function is closely associated with male sexual capacity.1

Life Extension® has discovered supportive clinical research for a scientifically validated, nutrient formula to promote endothelial function and blood flow to the place men need it most—for maximum performance.

The ingredients found in Prelox® Natural Sex for Men® have yielded compelling and highly satisfactory results in five independent clinical studies.2-6 Our analysis also confirms that unlike some performance enhancement supplements marketed as “natural,” Prelox® Natural Sex for Men® is not adulterated with trace amounts of prescription drugs.

A Powerful Synergy to Support Sexual Health
The patented blend of the following ingredients positively affects the male physiology in three ways, to provide optimal support:

1. PYCNOGENOL® (standardized French maritime pine bark extract) activates endothelial nitric oxide synthase (eNO-S),7 the enzyme required to make nitric oxide. Nitric oxide (NO) relaxes the vessels that enable efficient blood flow—the key to healthy male sexual activity and overall vascular health. Pycnogenol® further amplifies this relaxing effect by extending the amount of time nitric oxide remains in the bloodstream.

2. L-ARGININE is the biological precursor to nitric oxide synthesis in the endothelium.7 It interacts synergistically with Pycnogenol® to sustain nitric oxide levels sufficient for healthy sexual function.

3. ICARIIN—from a natural botanical extract used in traditional Chinese medicine—has been shown to deactivate the enzyme normally responsible for winding down male sexual response, further promoting sustained activity.8 Prelox® Natural Sex for Men® contains a standardized extract providing a proprietary form of high-quality icariin.

The suggested dose of two Prelox® Natural Sex for Men® tablets each day provides:

**Prelox® Proprietary Blend**
- 1440 mg
- L-Arginine HCl, Aspartic Acid, Pycnogenol®
- Dried French Maritime Pine (Pinus pinaster) Extract (bark)
- Icariin (Natural Sex® Epimedium sagittatum Extract (aerial parts))

A 60-tablet bottle of Life Extension® Prelox® Natural Sex for Men® retails for $52. If a member buys four bottles, the price is reduced to just $36 per bottle.

**References**

Prelox® and Pycnogenol® are registered trademarks of Horphag Research Ltd. Prelox® is protected by U.S. patent #6,565,851B2. Pycnogenol® is protected by U.S. patents #5,720,956 and #6,372,266 and other international patents. Cannot be sold outside the USA.

To order Prelox® Natural Sex For Men®, 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.
Too often the word ‘icon’ is used to describe people who hardly deserve the distinction, but in the case of Dr. Ruth Westheimer, a woman who practically created the modern day mainstream sex therapy industry, it is the only word that truly fits. Dr. Ruth’s rise to prominence began in 1980, when a New York radio station brought her in as a guest on one of its shows to try and spice things up with some talk of the then-taboo subject of sex.

It is easy now to think of all the good-natured caricatures that have been done honoring Dr. Ruth’s unique personality, but let’s not forget that she has studied at the University of Paris, The New School, the Teachers College at Columbia University, and she did her post-doctoral work in human sexuality at New York-Presbyterian Hospital. She also speaks four languages, has taught seminars at both Princeton and Yale, and she has been the foremost expert in her field for over three decades. This is all to say that she has the educational chops to back up the endearing personality. But back to 1980… >
After only two appearances as a guest, the station director suggested they give Dr. Ruth her own forum, which she promptly got in the form of a fifteen minute program that aired at midnight on Sunday nights.

It would be easy to presume that a quarter-hour show that aired during the graveyard shift on Sunday night would be quickly forgotten, however, as we now know, that wasn’t the case. The show was called *Sexually Speaking* and taped at NBC’s legendary 30 Rock Studio. In a very short time, the fifteen minute program became a hit and was expanded to an hour. Soon, David Letterman called, asking her to be a guest on his show, and within a few years, Dr. Ruth became a household name as America’s sex therapist. She has since been in national commercials, written several best-selling books, and to this day, at age 85, she still appears on national media outlets to talk about sex, or her newest area of expertise, being a caregiver for Alzheimer’s patients.

**Staying On Top**

One of the ways that Dr. Ruth keeps her energy up is that she says she always walks when she talks. In the middle of her eighth decade, she has no plans of slowing down.

“My exercise has always been walking. When I talk, I walk, and I talk a lot,” she says. “As I talk to people on the phone and do interviews, I walk around. I also live in New York City and I’m out almost every night, which means I am walking places all the time. Also, when I teach, I walk and talk. I am fortunate that I am very healthy at my age and that I am still doing what I enjoy on a daily basis. This spring I’m teaching a graduate course at Columbia University.”

The vintage enthusiasm in Dr. Ruth’s voice comes through as she describes the course, which will be about family in film, theater, television, and the internet.

“The course is already fully registered,” she says. “And I just finished teaching six years at Yale and Princeton.”

At a time when many octogenarians are taking it easy in retirement, Dr. Ruth subscribes to the theory that keeping up a full, fulfilling schedule doing the things you’ve always loved is the best way to stay mentally sharp and physically young.

“I do a lot of fundraising and that keeps me out,” she says. “And after all these years, I still get pleasure when I open the *New York Post* and find my name in it.”

And of course, what would a profile of Dr. Ruth be if we didn’t dive into her favorite topic: sex.

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**Words From the Expert**

“One of the best pieces of news I’ve had over my career is that across the country, women have heard the message that they have to take responsibility for their own sexual satisfaction,” she says. “Even the best lover can’t bring her the sexual satisfaction if she doesn’t tell him what her needs are.”

Dr. Ruth realizes that as women age, they go through certain changes that may affect their libido or their confidence, which may lead them to thinking that sex is no longer an option. In her straight-to-the-point way, she is out to dispel that myth. In fact, she wrote an entire book on the topic titled, *Dr. Ruth’s Sex After 50*.

“There is no evidence that going through menopause means that a woman loses her sex drive,” she says. “Going through menopause will bring many changes to her life, in general, some of which may have a negative effect on her sex life, especially if she is not forewarned and adequately prepared to deal with them. But menopause is not a death sentence to a woman’s sex life by any means.”

Another area where Dr. Ruth likes to buck conventional wisdom has to do with ageism, or the idea that after a certain age, people should just accept that sex will no longer be a part of their lives.
“There are common perceptions about older people held by the general public, even among senior citizens themselves that are just not true,” she says. “One of these is that older people aren’t sexy. This is rubbish. Humans can continue to have and enjoy sex into their nineties. Your sex life is not supposed to come to an end just because you’ve hit a certain age.”

Dr. Ruth says that, to put it delicately, some postmenopausal women don’t enjoy sex as much as they did when they were younger because of some discomfort brought on by the shrinking of tissues in certain areas of the body. The cure: More sex.

“The more women engage in sex, the less severe the symptoms of menopause related to good sexual functioning will be,” she says.

On to the Men

The biggest fear men have when it comes to sexual function as they age can be boiled down to two letters, E.D., as in Erectile Dysfunction. While there are plenty of pills and prescription drugs that are available to help men who suffer from this problem, Dr. Ruth cautions that men should make sure they eliminate other reasons for the loss of the ability to perform before they start taking a drug.

“The number of men who suffer from physically based erectile dysfunction is relatively small,” she says. “Even in older men. And not every one of these needs or is able to take a pill. There are many men who have a problem that is not physical at all, rather it’s psychological. I think the pills can be wonderful if a man is the right candidate for them, but they may not be necessary.”

Psychological issues older men may be dealing with when it comes to sexual performance range from damaged egos, to having an unhealthy body image, to sheer embarrassment that they are unable to perform as they once did and that they no longer have the energy that they once had.

It is of paramount importance that the men experiencing these issues discuss them with the women in their lives. Having open communication is the first step to solving some of these problems. Sometimes simply discussing these topics will lead to solutions. For instance, if a man doesn’t like how he looks, he can start exercising and eat better with the encouragement of his wife. If he’s embarrassed about not being as virile as he once was, his wife can reassure him that she’s had changes too, and that they are okay.

Other times, there may be a physical issue behind lack of sexual function, including heart disease, high blood pressure, or low testosterone.

“In men whose testosterone becomes greatly reduced, many of the same symptoms women have may occur,” Dr. Ruth says. “This includes hot flashes, increased irritability, bone loss, inability to concentrate, and depression, and, on top of those, a diminished sex drive. Some people refer to this as ‘andropause’, as the male sex hormones are referred to as androgens. But whatever you call it, when it happens, it is often best to deal with it both medically and psychologically.”

A New Cause

While Dr. Ruth continues to remain on the front lines of the sex therapy industry, she has recently released a book titled, Dr. Ruth’s Guide for the Alzheimer’s Caregiver. In it, she discusses a myriad of ways that people can handle a loved one’s Alzheimer’s diagnosis without getting overwhelmed.

“The reason I wrote this book is because I have so many friends that have dealt with this dreadful disease,” she says. “I felt that it behooved me to do something to help the caretakers. In this aspect, they have to do something for themselves before they run out of steam. People should not say ‘no’ to their own desires. They should say yes, and take the time to still do things they enjoy.”
She cites many examples, including a physician friend who wanted to retire to take care of his wife, but who she advised to maintain his practice while also being a caregiver. The book has chapters that deal with nearly every aspect of being a caregiver, including chapters titled “How to Help Yourself,” “You Get to Have a Life, Too,” “Dealing with Professional Caregivers,” “When You’re Taking Care of a Spouse,” “Helping Children and Grandchildren Cope,” and more.

As always, the aspects of maintaining a healthy sex life are covered as well. “In some cases, Alzheimer’s patients lose all inhibitions, and either demand sex or demand not to have it,” she says. “A caregiver has to know that is all part of the disease. I actually tell people, if need be, and if they are willing, they should try to have another partner very discretely. Nobody should know. In nursing homes, I would like to make sure that there’s a dating room, with a sign like in a hotel that says do not disturb. There’s a need for caressing and being held at every age.”

From sex to Alzheimer’s, from teaching to writing, America’s sex therapist has advice for everyone.

For more information on Dr. Ruth, please visit: www.drruth.com.

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

Low Testosterone Levels May Lead to:
Reduced Sex Drive • Less Energy
Cloudy Thinking • Weight Gain
Cardiovascular Issues

Maintaining healthy testosterone levels is one of the most important steps you can take to regain your health and improve your performance. With research showing that by the time a man is 60 years old, he may produce 60% less testosterone than he did in his 20s, the time is now to add Life Extension’s Super MiraForte with Standardized Lignans to your supplement regimen.

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

- 1500 mg Chrysin
- 15 mg Bioperine®
- 850 mg Muira puama
- 282 mg Nettle root
- 15 mg Chelated elemental zinc
- 320 mg Maca
- 33.4 mg HMRlignan™ Norway Spruce lignan extract

The retail price for a bottle of 120 capsules of Super MiraForte with Standardized Lignans is $62. If a member buys four bottles, the price is reduced to $42 per bottle.

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

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

Bioperine® is a registered trademark of Sabinsa Corp. HMRlignan™ is a registered trademark used under sublicense from Linnea S.A.

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Advanced Natural Sex for Women® 50+ provides a unique phyto blend that targets and supports the mechanisms that promote healthy sexual function and libido*

**Cordyceps**: This mushroom extract modulates the levels of sex hormones and promotes their downstream flow; boosts mitochondrial energy and sex interest by increasing adenosine triphosphate (ATP) production; supports vaginal lubrication and sexual function by promoting nitric oxide; and inhibits pro-inflammatory cytokines that can dampen sexual desire. In placebo-controlled studies, scientists documented that Cordyceps improved sexual function and desire in 86% of women—in **40 days**!

**Lepidium meyenii** (Maca): Cultivated for over 2,000 years, this plant root extract has now been shown to modulate levels and flow of sex hormones; support adrenal function; and promote libido and sexual pleasure by helping to optimize brain neurotransmitters and monoamine oxidase (MAO) levels. Women who took Maca scored over 35% better than placebo subjects on a standard sexual function and libido scale after just **6 weeks**!

**Menopausal Relief and Enhanced Sexual Health**

Menopausal transition is considered the most difficult time for a woman to remain sexually active. In addition to the hot flashes and fatigue, vaginal dryness and loss of libido often interfere with sexual function.

Advanced Natural Sex for Women® 50+ also contains three herbal root extracts used for over 400 years in Korea to help inhibit symptoms of menopause:

1. **Phlomis umbrosa**
2. **Cynanchum wilfordii**
3. **Angelica gigas**

Scientists found that when these three natural botanicals are uniquely blended and then hot water extracted, they balance estrogenic activity in just those target tissues specifically related to menopausal symptoms. In a double-blind, placebo-controlled study, this special formulation (*EstroG-100™*) helped inhibit menopausal symptoms by 62% in just **12 weeks**!

The suggested three capsules a day of Advanced Natural Sex for Women® 50+ (sexual health and menopausal formula) provide the following extracts:

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<tr>
<th>Proprietary Blend</th>
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<td>MacaPure® Maca (<em>Lepidium meyenii</em>) extract</td>
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<tr>
<td><em>EstroG-100™</em> (proprietary blend of <em>Angelica gigas</em>, <em>Phlomis umbrosa</em>, <em>Cynanchum wilfordii</em> extracts)</td>
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<tr>
<td>Cordyceps (<em>Paecilomyces hepiali</em>) extract</td>
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A bottle of 90 vegetarian capsules of Advanced Natural Sex for Women® 50+ retails for $59. If a member buys four bottles, the price is reduced to $34 per bottle.

**References**

MacaPure® is a registered trademark of Natures, Inc.

To order Advanced Natural Sex for Women® 50+, 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.*
Are You Suffering from Fructose Poisoning?

The processed food industry wants you to believe that fructose is a natural, healthy sugar derived from natural plant sources. The science shows something vastly different. In reality, fructose is a harmful toxin that is a key factor in the development of metabolic syndrome in America today.

Excessive fructose consumption is responsible for:

- 39% increase in abdominal obesity in men.
- 9% increase in insulin resistance.
- 11% increased risk of hypertension in men.

It also increases your risk of abnormal lipid profiles and inflammation. In fact, the highest consumers of sugar-sweetened beverages have a 20% increased risk of cardiovascular disease!

The sweetener industry spends tens of millions of dollars each year in attempts to hoodwink the American public regarding the bitter truth about fructose. All their efforts are paying off: Between 1970 and 1990, Americans’ consumption of high fructose corn syrup rose by more than 1,000%, an increase that paralleled the rapid rise of the obesity epidemic.
Fructose Poisoning

Are you a victim of fructose poisoning? If you have high blood pressure, high cholesterol, belly fat, or insulin resistance, the answer is likely yes.

Fructose might taste sweet to your taste buds, but there’s nothing sweet about what it does to your body. Mounting evidence shows that fructose is responsible for multiple factors involved in metabolic syndrome.2,3

The reason for these disastrous health problems is that high intake of fructose acts more like a toxin than a nutrient.9 Like a toxin, it is metabolized almost exclusively in the liver, where it is converted into dangerous byproducts (such as excess lipids and uric acid).10-16 And, like a toxin, fructose has direct harmful effects (glycation) on tissues throughout the body, while performing no necessary nutritional function.17,18
Recent research has shown that you can induce metabolic syndrome in rats by feeding them fructose in amounts relevant to human consumption. That’s incredibly important, since on average fructose now makes up 10 to 15% of the calories Americans consume. Some adolescents get nearly 30% of their calories from fructose!

Study after study has demonstrated that excessive fructose consumption directly causes all five components of metabolic syndrome: abdominal fat, high blood pressure, abnormal lipid profiles, insulin resistance, and inflammation.

**Central Obesity**

When scientists need to produce a quick model of central obesity, they’ve found a convenient solution: Feeding rats fructose for several weeks produces an animal with features of metabolic syndrome, including increased abdominal fat, high triglycerides, and elevated fasting blood glucose.

Studies of primates and smaller laboratory animals now show that fructose intake can be directly linked to the development of central obesity. In addition, a recent study found that fructose-fed animals had increased levels of the enzyme that activates the stress hormone cortisol, which is a well-known cause of central obesity.

Population-based studies show that women with the highest fructose intake have a 20% increased risk of abdominal obesity, while men have a 39% increased risk of abdominal obesity. A direct observational study of 559 adolescents demonstrated a strong and significant correlation between total fructose intake and abdominal obesity.

From these data it’s clear that the more fructose you consume, the more abdominal fat you are likely to gain.

**Elevated Blood Sugar**

Men and women who consume high levels of fructose have a 9% increased risk of insulin resistance, a key component of metabolic syndrome. As is the case with central obesity, scientists have found that feeding rats a fructose solution can rapidly produce a reliable model of insulin resistance.

The reasons why fructose elevates blood sugar are becoming increasingly better understood. Animal studies demonstrate that fructose consumption has direct harmful effects not only in the liver, but also in the brain. Fructose triggers signaling changes in the hypothalamus, the “appetite thermostat” that regulates food intake and directs other body tissues in how to handle sugar.
One of those changes causes muscle cells to take up glucose less efficiently, contributing to elevated blood glucose levels even in the presence of sufficient insulin. Another causes the liver to ramp up its own production of new glucose, adding to the already high burden of blood sugar.

Insulin resistance produced by fructose consumption not only produces high blood sugar, it also results in chronically elevated levels of insulin. An appropriate amount of insulin is necessary, but continuous exposure to raised insulin levels is now recognized as a major contributor to cardiovascular disease and cancer.

**Abnormal Lipid Profiles**

As we’ve seen, the effects of fructose in the liver produce marked increases in the production of fats, especially dangerous triglycerides. Elevated triglycerides and lowered HDL cholesterol levels together make up another component of metabolic syndrome.

A high fructose intake produces very high after-meal triglyceride levels in both animal and human studies. In humans, this has been shown to be directly related to fructose-induced impairments in the way triglycerides are cleared from the blood. Animal studies confirm this effect and also demonstrate that fructose induces many genes that increase new fat production and raise triglyceride levels.

One human study demonstrated that just seven days of elevated fructose consumption increased fat deposition in liver and muscle, while increasing VLDL-triglycerides. Similar studies comparing the effects of excessive calories from either glucose or fructose showed that fructose (but not glucose) produced high 23-hour triglyceride exposure and new fat formation in the liver. Another study showed that ingesting fructose caused a 2.5 mg/dL drop in beneficial HDL.

All that excess fructose-induced fat production leads to increased fat deposition in the liver. Excessive liver collections of fat, beginning as non-alcoholic fatty liver disease (NAFLD), are considered the liver manifestation of metabolic syndrome; up to 30% of adults now suffer from this condition. Fructose is now widely recognized as a major contributor to NAFLD. NAFLD progresses to produce non-alcoholic steatohepatitis, a precursor to liver cirrhosis and eventual liver failure.

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**Deadly Effects of Fructose**

- We are being systematically poisoned by fructose, a low-cost sweetener that is pervasive in our food supply.
- Studies in both lab animals and in humans show that fructose produces all five components of metabolic syndrome.
- Fructose can’t suppress your appetite the way glucose does, so you keep eating after you are full, contributing to abdominal obesity.
- Fructose triggers changes in the liver leading to insulin resistance and elevated blood sugar.
- Fructose diverts normal liver enzymes to produce abnormally large amounts of new fat molecules, contributing to unbalanced lipid profiles and fatty liver disease.
- Fructose raises production of the metabolic toxin uric acid, which is a major contributor to hypertension.
- Fructose acts through the “JNK” pathway to stimulate body-wide inflammation.
- To avoid developing metabolic syndrome, limit your consumption of fructose to less than 25 grams per day.
Fructose: The Sweetest Toxin

Dr. Robert Lustig, a world-renowned expert on metabolism at the University of California at San Francisco, applied the term “toxin” to fructose.9 Based on the information below, it’s easy to see why.

Fructose doesn’t suppress hunger. When you eat a glucose-rich meal, your body releases a burst of insulin to drive the glucose into cells; the rise in insulin raises levels of leptin, a hormone that signals “I’m full” to the brain. At the same time, such a meal causes levels of ghrelin, the “hunger hormone,” to fall. The combined effect of rising leptin and falling ghrelin normally serves to tell your body to stop eating when you’ve had enough. The problem is that fructose doesn’t trigger a rise in insulin and leptin or suppress ghrelin.56 In fact, it does just the opposite: It causes ghrelin levels to rise.10 As a result, your brain perceives that you are still hungry, so you keep eating well after you have consumed the calories you actually need.10

Fructose increases fat formation by the liver. The liver is the only organ in the body capable of managing fructose.10,11 But whereas the liver stores excess glucose in the form of harmless (and useful) glycogen, it converts fructose into fats (lipids) very rapidly.12-14 That newly made fat is then formed into dangerous small LDL particles, which travel through the body to be taken up by fat cells and damage blood vessels.12 A substantial portion of that new fat remains in the liver, contributing to the fatty liver that’s part of metabolic syndrome.

Fructose increases glycation. Fructose is 7 to 8 times more potent at producing dangerous advanced glycation end products (AGEs) than glucose.17,18 AGEs are major triggers of inflammation, and are implicated in the development of diabetes, heart disease, and neurodegenerative diseases.

Fructose promotes uric acid production. Uric acid is a natural byproduct of metabolism that the liver normally converts into urea for excretion in the kidney. But fructose disrupts that process, boosting uric acid levels into the abnormal range.14-16 Uric acid is a powerful tissue toxin and has recently been shown to promote high blood pressure.15

High Blood Pressure

When lab rats are given drinking water with 10% fructose, they develop hypertension, yet another manifestation of metabolic syndrome.44 High fructose consumption in humans has a similar effect, raising the risk of hypertension by 9% in women and 11% in men.3

Just two weeks of excessive fructose consumption in healthy adult men raised their systolic (top number) blood pressure by an average of 7 points, and their diastolic (bottom number) by 5 points.15 And just one serving of soft drinks raised blood pressure by 1.6 and 0.8 points systolic and diastolic, respectively.45

Laboratory studies now show that there are a number of ways in which fructose consumption raises blood pressure. Fructose triggers very high rates of uric acid production in the liver, which in turn causes blood pressure to rise.16,46,47 High uric acid is a common finding in people with metabolic syndrome.48 Treating fructose-induced hypertension with the gout drug allopurinol returns both uric acid levels and blood pressure to normal.15
Is Fructose Really Different from “Natural Sugar?”

“But isn’t fructose a natural sugar?”

If that’s what you’re thinking, you’re right—it is. And that’s exactly what the food industry wants you to think as well.

The corn sweetener industry wants to debate any connection between fructose and the epidemic of obesity and metabolic syndrome. They’ll tell you that fructose is a natural product, and that the animal studies showing fructose to be dangerous used “hyper doses” of fructose, at 40%, 50%, or even 60% of total calorie intake, a ridiculous amount. Yet research clearly links fructose to increased risk for conditions associated with metabolic syndrome, abnormal blood lipids, heart disease, and other serious health concerns.3,15,36

Let’s clear up this confusion once and for all.

What exactly is fructose? Fructose is a naturally occurring sugar found primarily in fruits and vegetables.58 Glucose is a naturally occurring sugar found in carbohydrates.58 Sucrose (table sugar) is made up of 50% fructose and 50% glucose.58

Please don’t avoid fruit and vegetables because they contain fructose. The slower absorption from whole fruit/vegetables should enable your liver to safely clear it. A limited study showed that people consuming very high fruit diets did not suffer adverse effects on body weight, blood pressure, and insulin and lipid levels after 12-24 weeks.59

Since the 1960s, the food industry has been loading up a growing proportion of the American food supply with a substance that’s vastly cheaper than sucrose: high fructose corn syrup.60,61 High fructose corn syrup can have up to 5% more fructose than table sugar (which we already consume in too high of quantities), it’s up to around 1.3 times sweeter than table sugar (increasing our need for sugar-sweetened foods), and it’s nearly impossible to avoid.58,62

Fructose also triggers excessive sodium retention, which is a major contributor to hypertension.55,49

Conversely, a low-fructose diet lowers blood pressure in chronic kidney disease patients.50

Central obesity, insulin resistance, lipid disturbances, and high blood pressure are the four “classic” components of metabolic syndrome.51 Increasingly, however, raised markers of chronic inflammation are recognized as playing an essential role in the condition as well.51,52 Let’s look briefly at how fructose promotes inflammation.

Inflammation: The Role of “JNK” Food

The human liver contains a natural stress-response system that goes into high gear as a result of various kinds of stress, especially stress from toxins. Officially called “c-Jun terminal kinase,” this system is known to scientists simply as “JNK.” Fructose (and foods that contain high amounts of fructose) activate the JNK pathway, which contributes to insulin resistance and ultimately to inflammation.11,53,54
The prevalence of obese and overweight individuals has increased dramatically in the decades since 1980. Between 1988 and 2000, the number of obese Americans (those having a BMI of 30 or more) grew from almost 23% to 30.5%. In the same time period, the proportion of overweight Americans (those having a BMI of more than 25 to 29.9) rose from 55.9% to 64.5%, while extreme obesity (defined as a BMI of 40 or more) rose from 2.9% to 4.7%. By 2010, the picture was even worse: For the first time in history, the average American was overweight (with a BMI of 28.7), and nearly 36% were obese.

This alarming increase in body size parallels an increase in something else: fructose consumption. Between 1970 and 1990, Americans' consumption of high fructose corn syrup rose by more than 1,000% (that's not a typo), vastly exceeding any other dietary changes in that period. By 2008, Americans were getting a full 10% of their calories from fructose. During that entire period, Americans were gaining weight at unprecedented rates, and the prevalence of metabolic syndrome was steadily rising. By 1990, the year the obesity epidemic really took off, the skyrocketing rate of total fructose consumption matches the rapid rise in the percent of obese Americans.
**Summary**

Despite the best public relations efforts of the corn sweetener industry, there’s no longer any doubt that Americans are slowly being poisoned by fructose, which has become ubiquitous in our food supply.

Study after study has shown that when we consume fructose in large quantities, our bodies treat it as a toxin. Fructose goes directly to the liver, where it disrupts a host of normal metabolic processes, producing each and every component of metabolic syndrome: central obesity, insulin resistance, abnormal lipid profiles, elevated blood pressure, and inflammation.

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**Nutrients That Protect Against Fructose-Induced Metabolic Syndrome**

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Effects on Fructose-Induced Metabolic Syndrome in Laboratory Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amla (Indian gooseberry)</td>
<td>Prevents insulin resistance and abnormal lipid profile&lt;sup&gt;37&lt;/sup&gt;</td>
</tr>
<tr>
<td>Anthocyanins (from dark fruits)</td>
<td>Protects fat cells from insulin resistance&lt;sup&gt;36&lt;/sup&gt;</td>
</tr>
<tr>
<td>Astaxanthin</td>
<td>Prevents insulin resistance&lt;sup&gt;56&lt;/sup&gt;</td>
</tr>
<tr>
<td>Coffee extracts</td>
<td>Attenuates glucose intolerance, hypertension, and cardiovascular remodeling&lt;sup&gt;66&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ginger</td>
<td>Lowers triglycerides, ameliorates fatty liver,&lt;sup&gt;27&lt;/sup&gt;improves insulin resistance&lt;sup&gt;32&lt;/sup&gt;</td>
</tr>
<tr>
<td>Green Tea</td>
<td>Ameliorates insulin resistance&lt;sup&gt;87&lt;/sup&gt;</td>
</tr>
<tr>
<td>Quercetin</td>
<td>Reduces abdominal obesity and inflammation&lt;sup&gt;68&lt;/sup&gt;</td>
</tr>
<tr>
<td>Resveratrol</td>
<td>Corrects imbalanced lipid profiles, normalizes blood pressure&lt;sup&gt;69&lt;/sup&gt;</td>
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<tr>
<td>Spirulina</td>
<td>Corrects blood sugar, lipid profile, liver function&lt;sup&gt;70&lt;/sup&gt;</td>
</tr>
<tr>
<td>Urtica dioica (stinging nettle)</td>
<td>Ameliorates insulin resistance, decreases serum glucose&lt;sup&gt;71&lt;/sup&gt;</td>
</tr>
<tr>
<td>Carnosine, Benfotiamine, and Pyridoxal-5-phosphate (vitamin B6)</td>
<td>Protects against glycation&lt;sup&gt;72,73&lt;/sup&gt;</td>
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</tbody>
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Even low- to moderate-sugar sweetened beverage consumption promotes inflammatory changes in otherwise healthy young men.<sup>5</sup>

Such changes have been shown to produce a 20% increase in cardiovascular disease risk for the highest consumers of sugar-sweetened beverages.<sup>6</sup> Even children aged 3 to 11 years show increases in their cardiac risk factors in direct proportion to their consumption of such beverages.<sup>55</sup>

As noted earlier, fructose-induced inflammation has been shown to contribute to non-alcoholic fatty liver disease, which has been referred to as “diabetes of the liver.”<sup>21</sup>
Unfortunately, it’s difficult to avoid fructose and high fructose corn syrup. Since the 1970s, high fructose corn syrup has been added to just about every prepackaged product you can think of. If you haven’t already eliminated fructose from your diet, now is the time to do so. Read product labels. Don’t be fooled by industry propaganda. Recognize that both high fructose corn syrup and table sugar provide vastly more fructose than your body can safely handle. And consider protecting yourself from this mass poisoning by taking nutrients that reduce the risk of fructose-induced metabolic syndrome.

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


Another Breakthrough in Antioxidant Defense!

In 2008, Life Extension® introduced Berry Complete, a unique, high-potency blend of extracts from Nature’s most powerful free radical fighters. The antioxidant strength of just one capsule equaled more than 50% of the recommended five daily servings of fruits and vegetables.

We then introduced an even more powerful antioxidant formula. A single capsule of the new Enhanced Berry Complete with Açaí delivers an antioxidant value equivalent to more than 100% of the recommended daily fruit and vegetable intake.

ORAC: A Measure of Antioxidant Power

To measure the antioxidant strength of various foods, scientists use what is known as the ORAC index. While berries score higher than most fruits and vegetables, açaí boasts one of the highest ORAC values known to modern science.

Unfortunately, most commercial products containing açaí do not reflect the full nutritional content of the fruit. Only a fraction of its phenolic content survives industrial processing, handling, and storage.

Why should this matter to you? It’s more than a matter of antioxidant potency. In 2010, a team of researchers reported for the first time that açaí, blueberry, and strawberry polyphenols may provide targeted support for cellular metabolic processes that promote neural and cognitive health in the aging brain. But you need the complete polyphenolic profile to get the benefit.

Enhanced Berry Complete with Açaí gives you a convenient way to obtain a broad spectrum of seasonal, hard-to-find, highly perishable foods, for optimal antioxidant value.

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To order Enhanced Berry Complete with Açaí, call 1-800-544-4440 or visit www.LifeExtension.com

References
**Astaxanthin** is a fat-soluble carotenoid compound. The challenge to deriving maximum benefits is its normally limited absorption—as low as about 50%. Assimilation of astaxanthin is impeded by limited uptake and intestinal degradation.

A new **Astaxanthin 4 mg with Phospholipids** combines 4 milligrams of natural astaxanthin with a proprietary blend of phospholipids.

By incorporating phospholipids, scientific study shows that carotenoid absorption may be enhanced several-fold.

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Increasing Prevalence of Obesity and Diabetes

From 1960 to 1980 about 15% of American adults were obese (BMI 30 or greater), but by the year 2002 that figure had doubled to over 30%. The prevalence of American children and adolescents classified as overweight roughly tripled between 1980 and 2000. But the problem is not restricted to the United States, as obesity and overweight diagnoses are increasing worldwide. Prevalence of childhood obesity in Brazil and India were recently estimated to be 22%, and for Mexico nearly 42%. Along with the increase in global obesity there has been a rise in type II diabetes (formerly called adult-onset diabetes before it affected so many children).

How Type II Diabetes Develops

Diabetes is generally defined as a condition of elevated glucose. Insulin, which is secreted from islet cells in the pancreas, helps glucose enter many body tissues. In type I diabetes, a person typically has little or no insulin production. More than 90% of all diabetics have type II rather than type I diabetes, however. Obesity often leads to insulin resistance, wherein it becomes more difficult for insulin to cause glucose uptake by cells. As a result of increasing insulin resistance, the pancreas increases insulin production and release in an attempt to get enough glucose into cells. Eventually pancreatic insulin production ceases, and type II diabetes progresses to an advanced stage.

Although insulin resistance is the best predictor for the development of type II diabetes, experts have different opinions concerning the mechanisms causing insulin resistance.
Keystone Symposia

Keystone Symposia is a non-profit organization that holds many scientifically prestigious conferences on a variety of topics in molecular and cellular biology. From January 27 to February 1, 2013, a symposium was held in Keystone, Colorado, on the subjects of diabetes and adipose tissue biology, organized and attended by leading scientific researchers in the field.
Insulin Resistance from Fat

Possibly no one has studied insulin resistance harder and longer than Gerald Shulman, MD, PhD (Professor of Medicine, Yale University, New Haven, Connecticut). Shulman’s favorite hypothesis is that excessive fat from the diet (or fat generated by high levels of fructose consumption) accumulates in cells, interfering with the cell-signaling involved in the pathway between a cell’s insulin receptor and uptake of glucose by the cell. In particular, the protein that transports glucose into a cell (GLUT4 protein) is prevented by fat from reaching the cell surface. When I asked Dr. Shulman about the effect of fat saturation (saturated fat) and chain-length of fatty acids on insulin resistance, he told me that these properties of fat do not matter (excluding fish oil, which he said has special signaling capabilities).

Kitt Petersen, MD (Professor of Medicine, Yale University, New Haven, Connecticut) has long been Dr. Shulman’s understudy and has co-authored many papers with him. Dr. Petersen has been focused on the role of exercise and mitochondria in insulin resistance. She has shown that exercise and weight loss increase insulin sensitivity. She has found evidence that age-associated decline of mitochondrial function is associated with defective fat metabolism, leading to fat accumulation and insulin resistance. Like Shulman, she believes that inflammation is a consequence rather than a cause of insulin resistance. When I asked her about the molecular mechanism behind insulin resistance in smokers, she told me that there are probably many mechanisms of insulin resistance and there is much to be learned about the subject.

Insulin Resistance from Inflammation

Alan Saltiel, PhD (Director, Life Sciences Institute, University of Michigan, Ann Arbor, Michigan) favors the view that inflammation is the link between obesity and insulin resistance. He has shown that mice that are genetically modified to not release the pro-inflammatory molecule NF-κB when fed a high-fat diet are protected from insulin resistance. He later showed that normal mice are similarly protected from insulin resistance due to a high-fat diet when given a chemical inhibitor that blocks NF-κB activation.

Tal Pecht (PhD student, Ben-Gurion University, Beer-Sheva, Israel) believes that inflammation from body fat (especially visceral fat) leads to insulin resistance. She cited studies indicating that necrotic cell death of fat cells attracts macrophages which may lead to insulin resistance. With her supervisor, Pecht demonstrated that macrophages in visceral fat form foam cells such as those found in atherosclerotic plaques, which results in inflammation and possibly insulin resistance.

Nutrients that health conscious people take today like curcumin, cinnamon, silymarin, and genistein (an isoflavone found in soybeans) suppress the pro-inflammatory molecule NF-κB.

Distribution of Body Fat

Susan Fried, PhD (Professor, Boston University School of Medicine, Boston, Massachusetts) has studied the relationship between body fat distribution and diabetes or cardiovascular disease. With increasing obesity, men become “apples” (round, more abdominal fat), whereas women become “pears” (more fat in the hips and thighs). Only abdominal fat is associated with increased cardiovascular disease and diabetes. After menopause, however, women accumulate more abdominal fat.
The Effect of When You Eat

Paolo Sassone-Corsi, PhD (Director, Center for Epigenetics and Metabolism, University of California, Irvine) presented evidence that disruption of biological clocks associated with the sleep-wake cycle and feeding can lead to cardiovascular disease and insulin resistance. Similar effects are seen for mice as for human shift-workers. Mice subjected to light at night have more body mass and less glucose tolerance than mice under normal light/dark conditions, despite equivalent food intake and activity. He said that when you eat can be as important as what you eat.

Genetic Causes of Obesity and Type II Diabetes

Ronald Kahn, MD (Professor of Medicine, Harvard Medical School, Boston, Massachusetts) has been studying genetic factors that influence obesity and type II diabetes in humans and mice. High metabolic rate and high levels of energy-generating brown fat are genetic influences that protect against obesity. Kahn has demonstrated in mice that genetic background also governs the degree to which obesity will lead to inflammation or insulin resistance. Dr. Kahn is currently following leads that the type of bacteria in the intestine influences the development of insulin resistance and type II diabetes.

FGF21 and Longevity

David Mangelsdorf, PhD (Professor and Chairman of the Department of Pharmacology, University of Texas Southwestern Medical Center, Dallas, Texas) has been studying Fibroblast Growth Factor 21 (FGF21), a growth factor secreted in the liver during fasting that has been shown to increase liver insulin sensitivity in rats made obese by a high-fat diet. Dr. Mangelsdorf has created mice that secrete more-than-normal amounts of FGF21 and live 30-40% longer without any calorie restriction. Like Snell and Ames dwarf mice (which also live longer than normal mice) the FGF21 transgenic mice are small, are more growth-hormone resistant, and are more insulin sensitive than normal mice.

Inflammation from Aging Rather Than from Fat

James Kirkland, MD, PhD (Professor of Medicine, Mayo Clinic, Rochester, Minnesota) has observed that although insulin resistance, type II diabetes, and inflammation continually increase with age, obesity begins to decline in late middle age. Although the inflammation associated with obesity mainly comes from macrophages, the inflammation associated with aging mainly comes from fat cells. Obesity is associated with fat deposition in tissues other than fat cells, which is believed to cause insulin resistance.
and fat toxicity. Saturated fats have been shown to kill heart cells. Fat toxicity impedes the function of and can even kill the insulin-producing cells of the pancreas. Dr. Kirkland has shown that aging increases susceptibility to fat toxicity. Certain saturated fats have been shown to kill cells by increasing synthesis of the waxy fats or by other means. Certain waxy fats can cause insulin resistance.

Dr. Kirkland believes that much of the chronic inflammation associated with aging and type II diabetes is due to inflammatory proteins (cytokines) secreted from senescent (old or damaged) fat cells, noting that fat is the largest organ in the body for an increasing percentage of the population. Dr. Kirkland initiated a study which showed that partial rejuvenation results from eliminating senescent cells in a mouse with accelerated aging. He is currently seeking to replicate that study in normal mice.

**Binge Drinking and Type II Diabetes**

Christoph Buettner, MD, PhD (Director, Laboratory for Metabolism and Diabetes, Mount Sinai School of Medicine, New York City, New York) was inspired by human epidemiological evidence that binge drinking leads to chronic insulin resistance or diabetes to investigate the molecular mechanisms in rats. He found that ethanol dosing in rats that simulates human binge drinking is toxic to the hypothalamus, and thereby induces insulin resistance. Short-term insulin resistance lasts for days after all the ethanol has been metabolized. Dr. Buettner is concerned that binge drinking continues to increase among college students. Adolescents are particularly vulnerable to brain damage from binge drinking.

**Summary**

I had made it a priority to attempt to gain from this conference an understanding of the mechanism by which insulin resistance is induced. I was surprised that opinions on this subject could be so different, but I believe that some of the reason for the divergence of views is that there is more than one mechanism involved. In particular, I think that in some cases inflammation can induce insulin resistance, whereas in other cases fat directly impedes cell signaling between the insulin receptor and the glucose transporter.

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**


In 1983, Life Extension® was the first to introduce CoQ10 as a proven method to enhance mitochondrial energy production.

CoQ10 has since gained universal recognition for its role in supporting cellular performance throughout the body.¹ ⁶

In an unprecedented breakthrough, a compound called PQQ (pyrroloquinoline quinone) has been shown to support mitochondrial biogenesis—the spontaneous generation of new mitochondria in aging cells.⁷ PQQ is available as a low-cost dietary supplement.

Mitochondria are cellular energy generators that supply virtually all the power your body requires for a healthy lifespan. An abundance of published studies underscores the critical importance of the mitochondria to overall health, especially as we age.⁸⁻¹⁴ Energy-intensive organs like the heart and brain are dense with mitochondria. Until recently, the only natural ways for aging individuals to increase the number of mitochondria in their bodies were long-term calorie restriction or exhaustive physical activity—which are difficult or impractical for most people to implement.

PQQ offers a viable alternative.
The Ultimate Cell Rejuvenator

The enormous amount of energy generated within the mitochondria exposes them to constant free radical attack. The resulting mitochondrial decay is a hallmark of aging.

PQQ protects and augments delicate mitochondrial structures to promote youthful cellular function in three distinct ways:

• **Antioxidant power.** Like CoQ10, PQQ is a highly potent antioxidant. Its extraordinary molecular stability enables it to facilitate thousands of biochemical reactions in the mitochondria, without breaking down, for maximum antioxidant and bioenergetic support.15

• **Favorably modulates gene expression.** PQQ activates genes that promote formation of new mitochondria7—and beneficially interacts with genes directly involved in mitochondrial health. These same genes also support healthy body weight, normal fat and sugar metabolism, and youthful cellular proliferation.16

• **Mitochondrial defense.** Mitochondria possess their own DNA, distinct from the DNA contained in the nucleus. Unfortunately, compared to nuclear DNA, mitochondrial DNA is relatively unprotected. PQQ’s antioxidant potency and favorable gene expression profile act to support mitochondrial defense.

Vital Protection for the Aging Heart and Brain

PQQ is an essential nutrient, meaning your body cannot make it on its own. A growing body of research indicates that PQQ’s unique nutritional profile supports heart health and cognitive function—alone and in combination with CoQ10.17,18 This comes as no surprise, given how much energy these vital organs need.

Research shows that PQQ supports heart cell function in the presence of free radicals and promotes blood flow in heart muscle.19 When taken in combination with CoQ10, just 20 mg per day of PQQ has been shown to promote memory, attention, and cognition in maturing individuals.20

A Breakthrough Weapon in the Battle Against Aging

Life Extension® has identified a purified, highly potent form of PQQ from Japan that is produced through a unique fermentation process. The result is the highest quality PQQ available on the market today called BioPQQ®.

A bottle containing 30 20 mg vegetarian capsules of PQQ Caps with BioPQQ® retails for $40. If a member buys four bottles, the price is reduced to $27 per bottle.

The recommended daily dose for PQQ is 20 mg. Those taking Mitochondrial Energy Optimizer or Mitochondria Basics only require an additional 10 mg of PQQ since these formulas already provide 10 mg of PQQ. The retail price for 30 10 mg PQQ caps is $24. If a member buys four bottles, the price is reduced to only $16.50 per bottle. (Item #01500)

BioPQQ® is a registered trademark of MGC (Japan).

To order PQQ Caps with BioPQQ® standalone or any other PQQ-containing formula call 1-800-544-4440 or visit www.LifeExtension.com

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LIMIT THE RELEASE OF GLUCOSE FROM STARCHY FOODS

Hundreds of studies document the importance of protecting against blood glucose surges.¹

What the public doesn’t realize is that a huge source of blood sugar emanates from dietary starch.²,³ This includes bread, pasta, potatoes, and rice. But even so-called healthy carbohydrates such as whole-grain bread and brown rice can induce undesirable glucose spikes.⁴

In a breakthrough development, scientists have shown that an enzyme called transglucosidase converts starches into prebiotic fiber—within your own digestive tract!⁵,⁶ Taking this enzyme with starchy meals helps avoid the flood of glucose into the bloodstream that results from eating carbohydrates.

COMPELLING HUMAN RESEARCH DATA

Published studies show that transglucosidase limits the amount of SUGAR released from STARCH, especially in the critical after-meal period. It does this by converting dietary starch into a beneficial indigestible prebiotic fiber.⁵,⁶

Transglucosidase has been demonstrated in humans to reduce the level of rapidly digested starch in a carbohydrate food item by 31%.⁷ This helps maintain healthy blood glucose, cholesterol, and insulin levels for those whose levels are already in the normal range.⁸⁻¹¹

SHIELD AGAINST AFTER-MEAL GLUCOSE SURGES

Each vegetarian capsule of the new GlycemicPro™ Transglucosidase contains a full 450,000 TG (transglucosidase activity units) of trans-glucosidase.

Just one capsule taken with starch-containing meals helps limit the release of sugar from starch. Those who consume a low-starch diet may need to take only one GlycemicPro™ Transglucosidase capsule daily with their starch-containing meal.

A bottle of 60 vegetarian capsules of GlycemicPro™ Transglucosidase retails for $54. If a member buys four bottles, the price is reduced to $37.50 per bottle.

References

Contains soybeans. Contains tree nuts (coconut).

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

GlycemicPro™ Transglucosidase, 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.
In 2011, Dr. Mike Moreno’s weight loss book, *The 17 Day Diet*, was a bestselling phenomenon. It spent eleven weeks at #1 on the *New York Times* bestseller list and has more than 900,000 copies in print today. For his next book, Dr. Moreno chose to tackle a subject that Life Extension® members know a great deal about: anti-aging.

In this exclusive interview, Dr. Moreno talks to Life Extension about the five factors of aging, some novel ideas he presents in his book, and his unique approach to the patient/doctor relationship.

**LE:** The first chapter of your book deals with what you term “the five factors of aging.” Can you briefly explain what they are?

**MM:** Absolutely. Inflammation is the first factor. The other factors of aging include methylation, oxidation, glycation, and immune impairment. Generally, most people classically think of inflammation as having to do with arthritis, but they fail to realize that inflammation itself underlies the major diseases of aging.
standpoint, it’s a result of these unstable molecules that wreak havoc on every organ in the body. However, a lot of oxidative stress can be prevented by a diet rich in antioxidants.

**LE:** Aside from its role in oxidation, the diet plays a big role in glycation, another factor of aging, doesn’t it?

**MM:** Yes. Glycation is a result of the interaction between the types of proteins and carbs that we eat. Glycation occurs when sugars react with the body’s lipids or proteins, resulting in the formation of non-functioning advanced glycation end products. Although glycation is a normal consequence of the aging process, it is far from desirable. Glycated white blood cells are unable to fight infection as well, meaning you’ll get sick more often. Portion control is also a factor in avoiding harmful glycation. Too much of a good thing can also be a bad thing. When you talk about something normally thought of as healthy, like fruit, you have to remember that in terms of a diabetic, it can be harmful. There is so much people can do through their diet to modify the risk of glycation.

**LE:** Speaking of getting sick, you list immune impairment as one of your factors of aging as well, next to methylation. Can you explain these two concepts?

**MM:** Innate immunity is our first line of defense in the war against infection. As we get older, it seems that our innate immune cells don’t communicate as well as they once did. This impairment applies to everything in our body. With an impaired immune system, we open the door for more degenerative diseases and tend to age faster. Methylation primarily has to do with DNA. It’s DNA driven. It’s a template for every cell in our body. When it’s occurring correctly, methylation keeps your DNA in good condition, therefore proper methylation can actually slow down aging when it’s balanced.

**LE:** What role does diet, vitamins, nutrition, and supplements have in fending off aging?

**MM:** When I think about natural immunity, I think about vitamins B6 and B12. I recommend a multivitamin. Vitamins A, D, E, and C are extremely valuable. Occasionally, one vitamin will be highly touted and then the skeptics will come out and declare that something might not be as helpful as we might have thought. That bothers me. If something helps, in any way, it is worth taking because these things really are critical. As for what foods are best, vegetables in any amount are always going to be fine. Across the board, lean proteins, fish, chicken, and poultry are all valuable. Whole grains are good, but too much can still serve as a source of increase in your blood sugar, which isn’t good.

**LE:** This is a good time to talk about the dangers of glucose, which you mention throughout your book.

**MM:** The main thing that people have to remember is that they should be cautious of their sugar intake. And it’s not just about cakes and pies. Fruit is not always your friend. I take lots of criticism from dieticians about limiting fruit. When you look at the diabetic issues that plague us all as we age, and you see children with type II diabetes, you know we have a problem with sugar in general. The problem is that no matter how it gets there, once sugar is in the
blood, it goes everywhere because the blood goes everywhere. If sugar is delivered via the blood to every organ, then the oxygen is crowded out and that damages the process of oxygen delivery to vital organs. This affects your kidneys, your heart, strokes, neuropathy, your eyes, almost everything. Excess sugar in the blood is something people really need to look out for.

**LE:** Most people would like the energy of youth as well. In what way is the thyroid overlooked in this function and how can we keep it healthy?

**MM:** There are many issues that can develop with the thyroid, but the most common is hypothyroid, which is an underactive thyroid. It is estimated that 27 million American adults have an underactive thyroid, and the best way to know is to have your thyroid checked with a blood test. If you do that, then you need to watch for symptoms, which are sometimes subtle, including lethargy and sudden weight gain. If you suffer from this condition, get plenty of calcium and vitamin D and make sure you consume enough iodine.

**LE:** We’ve gone into some specifics thus far, but what is the overarching theme of the anti-aging strategies in your book?

**MM:** The book’s focus is to slow down the aging process. I try to distinguish the process of aging from the process of getting older. How we get older and how our organ systems get older is what we can help control. To make those systems healthier is not as difficult as people think it is. Once you make those systems healthier, your whole body becomes healthier and you live longer.

**LE:** America is no longer one of the healthiest countries in the world and we are plagued by epidemics of heart disease, cancer, diabetes, and obesity. How can the doctor/patient relationship help change that?

**MM:** It’s sad but true that people are unhealthier now than they’ve ever been in this country. We have made so many advances in science and technology and we’re still unhealthy. I think part of the problem is that the vast majority of patients need to take personal responsibility for their health. As physicians, we need to make sure we treat each patient differently based on their needs. Medicine should not be a “one size fits all” business. You can’t just tell someone they need to start walking 30 minutes a day. That might not work for them.

**LE:** How do you personalize a patient’s visit in your own practice?

**MM:** One of the first things I have a patient do is walk me through their typical day. Tell me about everything you do from the moment you get up until you go to bed. Then walk me through the week, or even two weeks. I often have patients keep a journal of a few weeks to record their eating and activity habits. Once I see that journal, we can identify the problems and work through it and come up with a program that works specifically for them.

**LE:** What are some general strategies that you have for patient improvement?

**MM:** The simplest thing I advise is for patients to get their blood work done regularly. I literally beg my patients to come in and get their blood work. It’s amazing how much prevention people pass up because of fears that can be resolved or treated with the right blood test. Like I said earlier, prevention is the key to longevity.

**LE:** Thank you for your time, Dr. Moreno.

**MM:** Thank you.

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. Michael Moreno, better known as “Dr. Mike,” is a graduate of the University of California at Irvine and Hahnemann Medical School (now Drexel University). Following his residency at Kaiser Permanente in Fontana, California, Dr. Mike moved to San Diego, where he now practices family medicine and sits on the board of the San Diego Chapter of the American Academy of Family Physicians.

To obtain a copy of The 17 Day Plan to Stop Aging by Dr. Mike Moreno, please visit www.amazon.com.
Taurine is so vital that scientists have described it as “one of the most essential substances in the body.” Food sources provide relatively little taurine, and as we age, synthesis of taurine in our bodies (from cysteine) markedly declines.

Fortunately, taurine is one of the lowest-cost nutrients, making it affordable to supplement with optimal doses.

SYSTEM-WIDE HEALTH BENEFITS

Taurine is one of the most abundant amino acids. Extensive studies have demonstrated the ability of taurine to support:

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- Regulation of the central nervous system
- Cell membrane stability and balanced water content
- Immune system modulation
- Bile salt formation
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To promote system-wide health, the body requires adequate levels of this essential nutrient.

ULTRA-LOW COST

A bottle of 50,000 mg capsules of Life Extension® Taurine retails for $8.95. If a member buys four bottles, the price is reduced to $6 per bottle.

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References:

It’s not often that you hear about an accomplished, main-stream trauma surgeon getting laughed at by his colleagues after presenting an innovative health idea. It is even less often that a doctor receiving that kind of response would admit to the laughter and even take it with a smile. But in the case of Dr. L. Ray Matthews, an assistant professor of surgery at Morehouse School of Medicine and the Surgical Critical Care Director at Grady Memorial Hospital in Atlanta, Georgia, he would also end up winning over those other surgeons who were skeptical of his cutting-edge thinking.

Now, you might be wondering, what was this radical idea that caused so much skepticism? It was simple: Dr. Matthews believed in the incredible healing power of vitamin D.

“People always ask me about how a surgeon could get involved in vitamin D research,” Dr. Matthews says. “My answer is that being a surgeon, I’m very interested in wound infections and getting patients off of ventilators. I’m interested in helping my patients heal faster, and I want to decrease the incidence of pneumonia. Essentially, I want my patients healthy and out of the hospital as quickly as possible.”
All of these desires led Dr. Matthews, who wanted to be a physician since he was four years old, to his renowned work with vitamin D.

Case in point, last summer, Dr. Matthews and a team of Morehouse doctors published a landmark paper in the *American Journal of Surgery* looking at the benefits of vitamin D’s use in critically ill patients, such as decreased length of hospital stays, decreased hospital costs, and decreased mortality rates. Dr. Matthews and his team also pioneered a medical therapy combination of vitamin D, omega 3-fatty acids, glutamine, and progesterone to treat patients with concussions and traumatic brain injuries.

Dr. Matthews is now writing a manuscript on vitamin D’s use in reducing the incidence of congestive heart failure, which is expensive to treat because of the high readmission rate associated with the condition.

“We can cut the 30-day readmissions rate by at least 50% using vitamin D,” Dr. Matthews says. “Vitamin D is an inexpensive way to increase cardiac contractility because it increases calcium absorption. Calcium makes the heart contract, or beat, better.”

Cutting hospital readmission rates, he says, is a top priority of the Centers for Medicaid and Medicare.

**Defining a ‘D’ Deficiency**

Vitamin D is a steroid hormone that directly influences over 200 out of some 20,000 to 25,000 human protein-coding genes and notably binds to a number of genes associated with autoimmune disease and cancer.

“You can’t achieve optimal health, athletic performance, or cognitive performance without adequate vitamin D levels. Vitamin D is a very powerful chemical in the human body,” Dr. Matthews says.

He strongly urges people to get their vitamin D levels checked on a regular basis, and he is careful to note that the government’s currently acceptable level of vitamin D in the bloodstream, with a lower limit of 30 ng/mL, is far too low.

“For me, anything in the 50 to 55 ng/mL range is where you want to be,” he says. “All animals in nature are between 50 and 55 ng/mL in the wild, but once we bring them into captivity, they drop. This happens in its own way to humans as well. When you’re in an Intensive Care Unit or another room in a hospital, your vitamin D level drops 50% in the first 24-48 hours. If you come into the hospital at 30 ng/mL, or below, and you drop below 18 ng/mL, your risk of death increases by 30%. It is a serious problem.”

Since the government has been lagging on this issue, Dr. Matthews has taken it upon himself to educate officials and explain the science and importance of vitamin D. He also believes that insurance companies are going to soon be all over the importance of the vitamin because it can prevent a lot of the chronic injuries that plague otherwise healthy people.

“I’ve met with a lot of government officials who didn’t know about what vitamin D can do,”
WELLNESS
PROFILE

Vitamin D: The Experiences of a Cutting-Edge Surgeon

• Dr. Matthews and a team of Morehouse doctors published a landmark paper describing the benefits of vitamin D’s use in critically ill patients, such as decreased length of hospital stays, decreased hospital costs, and decreased mortality rates.

• Vitamin D is a steroid hormone that directly influences over 200 of some 20,000 to 25,000 human protein-encoding genes and notably binds to a number of genes associated with autoimmune disease and cancer.

• “You can’t achieve optimal health, athletic performance, or cognitive performance without adequate vitamin D levels. Vitamin D is a very powerful chemical in the human body,” Dr. Matthews says.

• Dr. Matthews presided over a parent-led vitamin D supplementation protocol at Martin Luther King, Jr. High School in Lithonia, Georgia, where the MLK football team has only had one concussion and almost a 100% reduction in sports injuries over the past two years.

Matthews says. “I’ve been giving lectures to educate them. You have to have a passion for it. Most people, once they see the evidence, accept what I’m saying. For instance, in our hospital, our mortality rate is down 42% with critically ill patients for all traumas with our new vitamin D protocol.”

Of course, Dr. Matthews wasn’t able to simply walk into his hospital and declare a new strategy for using vitamin D on all patients. It took much convincing, and that convincing began with, of all people, the staff nutritionist.

“The best way I could explain what I was talking about was to show the nutritionist our patients’ vitamin D levels as they were admitted,” he explains. “I would order the test right away and as they’d come back, I’d walk over to the nutritionist and show her. We had some horribly low levels. The average person coming into the ICU at Grady had a hydroxyvitamin D level of 15 ng/mL, which is very, very low. But we’d see people with single digit numbers. Four, Six. Once I showed the nutritionists these numbers, my question to them was, ‘Why aren’t you checking vitamin D levels?’”

Dissecting Low D Levels

Dr. Matthews points out that up until this most recent generation of children, people didn’t use much sunscreen, and they didn’t limit their time outdoors. Also, as technology gets better and better, fewer and fewer Americans are working outside. When you’re indoors, 98% of sunlight is blocked out.

“You can only make vitamin D from the last week in March until the first week in October,” he explains. “You need the sun at a ninety degree angle in the Northern Hemisphere to make vitamin D. Even in the winter we can’t grow crops or food or vegetables. This means most Americans aren’t making any D for close to five months a year. This is why D levels plummet in the winter and so many people get sick due to compromised immune systems. People get the winter blues and become ill.”

When you combine massively reduced sun exposure with an overall vitamin-deficient diet, you get the perfect storm of D deficiency that we see today.

“This deficiency is showing up everywhere,” Dr. Matthews says. Elite military personnel such as Navy SEALs experience a high rate of stress fractures—up to 23% during unit training. “They’re testing these soldiers, and their vitamin D levels and intakes are low. There is now a push trying to get the military to supplement the Navy SEALs with vitamin D,” reports Dr. Matthews.
Another area where low D levels are showing is in the world of sports. The National Football League’s New York Giants recently did a vitamin D study in 2010 and found out that 81% of their players were vitamin D deficient or insufficient, as reported during the American Orthopedic Society for Sports Medicine convention held in San Diego. The players that had lower levels of vitamin D were susceptible to more soft tissue injuries. In addition, the National Hockey League’s Chicago Blackhawks have most players on 5,000 IU of vitamin D a day to help reduce injuries and have seen impressive results.

“When your vitamin D level gets too low, it affects your skeletal system,” Dr. Matthews explains. “If your skull is made of bone, you can strengthen it with D levels to help it withstand hits. There is a direct correlation between the levels of vitamin D dropping in young athletes and the current rise of concussions.”

Dr. Matthews presided over a parent-led vitamin D supplementation protocol at Martin Luther King, Jr. High School in Lithonia, Georgia, where his nephew was a student athlete. In 2011, the school began a nutrition program that included a daily dose of vitamin D. During the past two football seasons, the football team finished with a 23-2 record in a competitive 5A conference. Even more important, MLK football team has only had one concussion and almost a 100% reduction in sports injuries over the past two years. Forty-nine MLK student athletes have received four-year scholarships to play football at the college level over the past two seasons.

“I think so much of this is due to the fact that we have strong muscles, but weak bones,” Dr. Matthews says. “Your skull can’t take as much force if it isn’t at full strength.”

Beyond D

In addition to a vitamin D deficiency making skulls softer, Dr. Matthews has noticed how this deficiency, coupled with a few others, can negatively affect the human brain.

“The human brain is made up of 30% of the omega-3 fatty acid DHA,” he says. “Most people are omega-3 deficient. You don’t repair a brick wall with straw, but that’s what so many people are doing. Their brains and skull need reinforcements, and we’re not giving them the nutrients they need. Instead we’re feeding them omega-6s, sugars, chemicals, cakes, pies, and cookies, all of which are associated with inflammation. That’s like throwing gas on the fire. If you’re deficient in either omega-3s or vitamin D, you’re in trouble. Much of America is deficient in both.”

One of the most impressive things about Dr. Matthews is that he isn’t just lecturing based on an untested hypothesis. Time and again his protocols involving vitamin D supplementation along with other nutrients have shown remarkable results in his hospital.

A recent case in particular brought him some notoriety, when a 17-year-old girl showed up in his trauma unit after she was in a horrific car accident, including a devastating head injury. According to Dr. Matthews, over half of the patients with her type of head injury do not survive and another 47% are in permanent comas or severely impaired for the rest of their lives. The remaining 3% regain consciousness.

When the young woman was admitted to the hospital, she was immediately administered a regimen of vitamin D3, omega-3 fatty acids, glutamine, and progesterone. These nutrients saved her life. The doctors saw slight improvements every day and, only six months after an accident that should have either killed or incapacitated her, the young woman was walking and talking and close to acting as if the accident never happened.

Summary

“The body needs hundreds of different vitamins, minerals, enzymes, and nutrients to function properly,” Dr. Matthews says. “Americans may have nearly 60 deficiencies. I don’t have time
to waste on something that’s not working, which is why I call vitamin D ‘God’s miracle vitamin’. It is the backbone drug supplement in treating traumatic brain injury because it works on so many levels. Vitamin D3 directly influences hundreds of human genes. That makes vitamin D a very powerful substance.”

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


Dr. Matthews is a full-time faculty member of Morehouse School of Medicine, Department of Surgery. He was appointed Assistant Professor of Clinical Surgery in February 2007. Dr. Matthews serves as a surgical critical care and trauma surgeon. Dr. Matthews received his medical degree in May 1989 from the University of Mississippi. He completed his surgical residency training at Morehouse School of Medicine in 1997; with prior residency training from Conemaugh Valley Memorial Hospital in Johnstown, Pennsylvania, Western Care Reserve System in Youngstown, Ohio, and the District of Columbia General Hospital in Washington, D.C. In June 2004, Dr. Matthews completed a two-year surgical critical care fellowship at the Mayo Clinical College of Medicine in Rochester, Minnesota. He was a Senior Associate Consultant at Mayo Clinic in Rochester, Minnesota from 2004-2006. Matthews is a diplomat of the American Board of Surgery receiving certification in both General Surgery and Surgical Critical Care.
Scientists have discovered that an extract of the fern
Polypodium leucotomos helps inhibit cellular changes in the
skin that can lead to premature aging due to sun exposure.¹

Taken orally, Enhanced FernBlock® with Red Orange
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Best of all, Polypodium leucotomos offers this protection
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protection (including the eyes, lips, and the scalp), without
the problems associated with sunscreen.²,³

Oral Sun Defense

FernBlock® has shown remarkable effectiveness in
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FernBlock® in this oral formulation works by promoting
the body’s ability to inhibit absorption of ultraviolet rays and
to quench the free radicals that this type of radiation can
generate.⁴,⁵ In one clinical study, Polypodium leucotomos
offered significant protection against the sun’s rays, even for
those taking medication that causes increased sun sensitiv-
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increase in the amount of time they spent in the sun.

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This product has been upgraded to contain Red Orange
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In a controlled human trial, 15 days of oral
supplementation with Red Orange Complex was
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Sanguinello, and Tarocco) extract (fruit and peel) 100 mg
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A bottle of 30 vegetarian capsules of Enhanced FernBlock®
with Red Orange Complex retails for $42. If a member buys
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FernBlock® is a registered trademark of Industrial Farmaceutica Cantabria, S.A.
Note: This product is not a sunscreen.

References
3. Available at: http://www.weg.org/2012/sunscreen/sun-
screens-exposed/toxicmaterials-and-hormone-disruption-

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.
VITAMIN D3 SOFTGELS
FOR SUPERIOR ABSORPTION

Study after study confirms the vital importance of maintaining optimal levels of vitamin D. Research often indicates that a blood level between 50–80 ng/mL of 25-hydroxyvitamin D is ideal. Because people have individual requirements, Life Extension® has created a large selection of vitamin D supplements to ensure that you achieve your vitamin D3 goals.

Keep in mind that you may already be getting 1,000-3,000 IU of vitamin D in your multi-nutrient formulas. Vitamin D is now available in superior absorbing softgels. A recent study demonstrated that the use of one 5,000 IU vitamin D softgel daily resulted in a near 30% increase in vitamin D levels in just 60 days.

VITAMIN D3 5,000 IU
60 softgels
Retail: $11
Four-bottle Member Price: $7.43 ea.
For those already obtaining 1,000-3,000 IU of vitamin D in their multi-nutrient formulas, this 5,000 IU potency is what many need to achieve optimal vitamin D blood levels. Item # 01713

VITAMIN D3 7,000 IU
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Retail: $14
Four-bottle Member Price: $9.45 ea.
Some individuals (such as those weighing more than 180 pounds) may require higher potencies of vitamin D. When combined with 1,000-3,000 IU obtained from multi-nutrient formulas, this 7,000 IU vitamin D3 softgel should enable these individuals to attain 25-hydroxyvitamin D blood levels above the desired range of 50 ng/mL. Item # 01718

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

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

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

VITAMIN D3 5,000 IU
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60 capsules (non-softgel)
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Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 5,000 IU of vitamin D3 and 1,000 mcg of iodine into one capsule makes taking these two nutrients economical and convenient. Item # 01573

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Retail: $28
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For those rare individuals who have difficulty absorbing enough vitamin D3 from softgels, this liquid of vitamin D can be used. Item # 01732

VITAMIN D3 1,000 IU
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Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced a 1,000 IU version. For most people, this 1,000 IU potency is insufficient to attain optimal vitamin D blood levels. For smaller individuals who obtain 2,000-3,000 IU in their multi-nutrient formulas (and children), this potency of vitamin D may be suitable. Item # 01751

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Retail: $12.50
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3. Have your blood drawn.
4. Your blood test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370; or review the results with your personal physician.

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**COMPREHENSIVE PANELS**

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- Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests.
- CBC includes immune (white) cell count, red blood cell count and platelet count.
- Also includes: C-Reactive Protein, DHEA-S, TSH for thyroid function, Estradiol, Progesterone, Vitamin D 25-hydroxy, Hemoglobin A1c

**FEMALE LIFE EXTENSION PANEL (LC322535)**

- Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests.
- CBC includes immune (white) cell count, red blood cell count and platelet count.
- Also includes: C-Reactive Protein, DHEA-S, TSH for thyroid function, Estradiol, Progesterone, Vitamin D 25-hydroxy, Hemoglobin A1c

**MALE WEIGHT LOSS PANEL (LCWLM)**

- Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests.
- CBC includes immune (white) cell count, red blood cell count and platelet count.
- Also includes: C-Reactive Protein, DHEA-S, SHBG, Free Testosterone, Estradiol, Free T3, TSH for thyroid function

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- CBC includes immune (white) cell count, red blood cell count and platelet count.
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- Pregnenolone and Dihydrotestosterone (DHT)
- To provide an even more in-depth analysis of a man’s hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel.

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- Pregnenolone and Total Estrogens
- To provide an even more in-depth analysis of a woman’s hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel.

**LIFE EXTENSION THYROID PANEL (LC304131)**

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**FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011)**

- CBC/Chemistry Profile
- See description above, DHEA-S, Estradiol, Total Estrogens, Progesterone, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3

**MALE COMPREHENSIVE HORMONE PANEL* (LC100010)**

- CBC/Chemistry Profile
- See description above, DHEA-S, Estradiol, DHT, PSA, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3

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**MOST POPULAR PANELS**

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

**CARDIOVASCULAR RISK PROFILE**

- Total Cholesterol
- HDL Cholesterol
- LDL Cholesterol
- Estimated CHD Risk
- Triglycerides
- Iron

**LIVER FUNCTION PANEL**

- AST (SGOT)
- ALT (SGPT)
- Total Bilirubin
- Alkaline Phosphatase
- LDH

**KIDNEY FUNCTION PANEL**

- BUN
- Creatinine
- Uric Acid

**BLOOD PROTEIN LEVELS**

- Total Protein
- Albumin
- Albumin/Globulin Ratio

**BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE**

- Red Blood Cell Count
- Monocytes
- White Blood Cell Count
- Lymphocytes
- Eosinophils
- Platelet Count
- Basophils
- Hemoglobin
- Polys
- Hematocrit
- Eos
- MCH
- Baso
- Polynuclearated Cells
- RDW

**BLOOD MINERAL PANEL**

- Calcium
- Sodium
- Potassium
- Chloride
- Phosphorus
- Iron

**COMPREHENSIVE THYROID PANEL**

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- $90
  - The VAP™ cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.

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* 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.
This test is used to check the blood level of DHEA-Sulfate (LC040920). This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.

DIABETES PANEL* (LC100019)
Glucose, Insulin, HbA1c, VAP™, Cortisol, C-Reactive Protein

MALE BASIC HORMONE PANEL (LC100012)
DHEA-S, Estradiol, Free and Total Testosterone, PSA

FEMALE BASIC HORMONE PANEL (LC100013)
DHEA-S, Estradiol, Free and Total Testosterone, Progesterone

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

Estradiol (LC004515)
For men and women. Determines the proper amount in the body.

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) (LC081950)
This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.

BONE HEALTH
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.

OSTEOCALCIN* (LC100249)
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.

DPD CROSS LINK URINE TEST (LC511105)
The deoxyypridinoline (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. Deoxyypridinoline can be used to monitor therapies (which may include bisphosphonate drugs) in people diagnosed with osteoporosis.

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PharmaGABA
Super Carnosine Capsules
Taurine Capsules

BONE & JOINT HEALTH
ArthroMax™ with Theaflavins and AprèsFlex®
ArthroMax™ Advanced with UC-II® and AprèsFlex®
Bone-Up™
Bone Restore
Bone Restore w/Vitamin K2
Bone Strength Formula w/KoAct™
Dr. Strum’s Intensive Bone Formula
Fast Acting Joint Formula
Glucosamine Chondroitin Capsules

BRAIN HEALTH
Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arbinate
CDP Choline Capsules
Cognitex® with NeuroProtection Complex
Cognitex® with Pregnenolone & NeuroProtection Complex
Cognitex® Basics
DMAE Bitartrate
Ginkgo Biloba Certified Extract™
Huperzine A
Lecithin Granules
Methylcobalamin Lozenges
Neuro-Mag™ Magnesium L-Threonate
Optimized Ashwagandha Extract
Phosphatidylserine Capsules
Rhodiola Extract
Super Ginkgo Extract
Vinpocetine

DIGESTIVE
Bifido GI Balance
Carnosoothe w/PicroProtect
Digest RC™
Enhanced Super Digestive Enzymes
Extraordinary Enzymes
Life Flora™
Natural Esophaguard
Pancreatin
Regimint
Theralac Probiotics

DURK AND SANDY PRODUCTS
Blast™
Inner Power™

EYE CARE
Bilberry Extract
Brite Eyes III
Eye Pressure Support with Mirtogenol®
Overexposed Polarized Sunglasses
Solarshield Sunglasses
Super Zeaxanthin with Lutein & Meso-Zeaxanthin Plus Astaxanthin and C3G
Super Zeaxanthin with Lutein & Meso-Zeaxanthin and C3G

FIBER
AppleWis® Polyphenol
Fiber Food
TruFiber®
WellBet PXG® plus Mulberry

FOOD
Rich Rewards™ Black Bean Vegetable Soup
Rich Rewards™ Spicy Cruciferous Vegetable Soup
Rich Rewards™ Cruciferous Vegetable Soup
Rich Rewards™ Lentil Soup
Rich Rewards® Coffee
(available in mocha, vanilla and decaffeinated)

HAIR CARE
Dr. Proctor’s Advanced Hair Formula
Dr. Proctor’s Shampoo
Super-Absorbable Tocotrienols

HEART HEALTH
AppleWis® Polyphenol
Advanced Lipid Control
Aspirin (Enteric Coated)
Cardio Peak™ w/Standardized Hawthorn and Arjuna
Cho-Less™
D-Ribose Tablets
D-Ribose Powder
Endothelial Defense™ with Full-Spectrum Pomegranate™
Fibrinogen Resist
Forskolin
Homocysteine Resist
Koil Healthy Joint Formula
Natural BP Management
Olive Leaf Vascular Support
Peak ATP® with GlycoCarn®
PhosphoOmega®
Policosanol
Pycnogenol® French Maritime Pine Bark Extract
Red Yeast Rice
Super Absorbable CoQ10™ with d-Limonene
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with BioPQQ®
Super Ubiquinol CoQ10 with Enhanced Mitochondrial® Support
Theaflavin Standardized Extract
TMG Powder
TMG Tablets

HERBAL/PHYTO PRODUCTS
Artichoke Leaf Extract
Astranthin w/Phospholipids
Berry Complete
Blueberry Extract
Blueberry Extract w/Pomegranate
Butterbur Extract w/Standardized Rosmarinic Acid
Calcium D-Glucarate
Enhanced Berry Complete with Acai
Full-Spectrum Pomegranate™
Grapeseed Extract with Resveratrol & Pterostilbene
Huperzine A
Kyolic® Garlic Formula 102 + 105
Kyolic® Reserve
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated)
(also w/CoQ10 & Green Coffee Extract)
Mega Lycope ne Extract
Optimized Ashwagandha Extract
Optimized Garlic
Pomegranate Extract
Pomegranate Juice Concentrate
Pycnogenol®
Optimized Quercetin
Resveratrol with Synergistic Grape-Berry Actives
Rhodiola Extract
Silymarin

HORMONES
Advanced Natural Sex for Women™ 50+
7-KETO® DHEA
DHEA
DHEA Complete
GH Pituitary Support Day Formula
GH Pituitary Support Night Formula
Liquid Melatonin
Melatonin
Melatonin Timed Release
Natural Estrogen with Pomegranate Extract
Pregnenolone
Prog estoCare for Women
Super Miraforté with Standardized Lignans

IMMUNE ENHANCEMENT
AHCC® (Active Hexose Correlated Compound)
Black Cumin Seed Oil
Black Cumin Seed Oil w/Bio-Curcumin®
Buffered Vitamin C Powder
Echinacea Extract
Zinc
Immune Modulator w/Tiifend®
Immune Protect with PARACTIN®
Lactoferrin
Norwegian Shark Liver Oil
Optimized Fucoidan w/Maritech® 926
Peak ATP® Thymic Protein A
Reishi Extract Mushroom Complex
Vitamin C with Dihydroquercetin
Zinc Lozenges

INFLAMMATORY REACTIONS
Arthrimune Joint Support
ArthroMax™ with Theaflavins Boswellia
Bromelain (Specially-coated)
DHA (Vegetarian Sourced)
Fast Acting Joint Formula
Ginger Force
Koil Oil
5-LOX Inhibitor w/AprésFlex®
Mega EPA/DHA
Mega GLA with Sesame Lignans
MSM
Natural Relief 1222™ Cream
Omega-3 Whirl
Serraflazyme
SODzyme™ with GliSODin® and Wolfberry
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract
Tart Cherry w/Standardized CherryPURE®
Zyflamend® Whole Body

LIVER HEALTH
Branch Chain Amino Acids
N-Acetyl Cysteine
Liver Efficiency Formula
Certified European Milk Thistle
Hepatopro
SAMe
Silymarin

MINERALS
Biosil
Bone Restore
Bone Strength Formula w/KoAct®
Bone-Up™
Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
### Buyers Club Order Form

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<th>Member Each</th>
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<th>Total</th>
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<td>01524</td>
<td>ACETYL-L-CARNITINE - 500 mg, 100 veg. caps</td>
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<td>AMIN - 500 mg, 30 caps</td>
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<td>ANTI-ADIPOCYTE FORMULA w/ADIPOSTAT &amp; INTEGRA LEAN®(ADVANCED) - 60 veg. caps</td>
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<td>01039</td>
<td>ARGinine/Ornithine - 500/250, 100 caps</td>
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<td>ARGinine/Ornithine Powder - 150 grams</td>
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<td>ARTHROMAX® w/THAFLAVINS &amp; APRESFLEX® - 120 veg. caps</td>
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<td>ASPRIN - 81 mg, 300 enteric coated tablets</td>
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<td>ASTAXANTHIN WITH PHOSPHOLIPIDS - 4 mg, 30 softgels</td>
<td>$16.00</td>
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**OCTOBER 2013**

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

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### To order call: 1.954.766.8433 or 1.800.544.4440

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### B

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<th>No.</th>
<th>Product Description</th>
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<td>BERRY COMPLETE - 30 veg. caps</td>
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<td>BERRY COMPLETE w/ACAI (ENHANCED) - 60 veg. caps</td>
<td>$29.00</td>
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<td>BETA-CAROTENE - 25,000 IU, 100 softgels</td>
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<td>BIFIDO GI BALANCE - 60 veg. caps</td>
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<td>BILBERRY EXTRACT - 100 mg, 100 veg. caps</td>
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<td>BIOACTIVE MILK PEPTIDES - 30 caps</td>
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<td>BIO-COLLAGEN w/PATENTED UC-II® - 60 caps</td>
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<td>BIOsil® - 5 mg, 30 veg. caps</td>
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<td>BIOsil® - 1 fl oz</td>
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<td>Biotin - 600 mcg, 100 caps</td>
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<td>01709</td>
<td>BLACK CUMIN SEED OIL - 60 softgels</td>
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<td>BLACK CUMIN SEED OIL w/BIO-CURCUMIN® - 60 softgels</td>
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<td>BLOOD PRESSURE MONITOR - ARM CUFF (medium)</td>
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<td>BLOOD PRESSURE MONITOR - WRIST (travel size)</td>
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<td>BLUEBERRY EXTRACT w/ POMEGRANATE - 60 veg. caps</td>
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<td>BONE RESTORE w/VITAMIN K2 - 120 caps</td>
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<td>BONE STRENGTH FORMULA w/KOACT™ - 120 veg. caps</td>
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**SUB-TOTAL OF COLUMN 1**

**SUB-TOTAL OF COLUMN 2**
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**SUB-TOTAL OF COLUMN 5**

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**SUB-TOTAL OF COLUMN 6**
To order online visit: www.LifeExtension.com

**Buyers Club Order Form**

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Buy 4 bottles, price each:
- 24.00 18.00
- 40.00 30.00
- 36.00 27.00
- 20.00 15.00
- 18.00 13.50

Buy 4 bottles, price each:
- 11.75 8.81
- 43.20 32.40
- 16.00 12.00
- 14.00 10.50
- 12.00 9.00

Buy 4 bottles, price each:
- 9.50 7.13
- 38.00 28.50

Buyers Club Order Form

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<th>EYE PRESSURE SUPPORT w/MIRTGENOL® - 30 veg. caps</th>
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Buy 4 bottles, price each:
- 34.00 25.50

**SUB-TOTAL OF COLUMN 7**

**SUB-TOTAL OF COLUMN 8**

**OCTOBER 2013**

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

**F**

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<th>No.</th>
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- 39.00 29.25
- 35.00 26.70

Buy 4 bottles, price each:
- 26.00 19.50
- 24.00 18.00

Buy 4 bottles, price each:
- 25.95 19.46
- 39.95 29.96

Buy 4 bottles, price each:
- 34.99 26.24

Buy 4 bottles, price each:
- 42.00 31.50
- 38.00 28.50

Buy 4 bottles, price each:
- 16.00 12.00
- 14.00 10.50
- 13.00 9.75

Buy 4 bottles, price each:
- 49.00 36.75
- 44.00 33.00

Buy 4 bottles, price each:
- 28.00 21.00
- 25.00 18.75

Buy 4 bottles, price each:
- 10.50 7.88
- 9.50 7.13

Buy 4 bottles, price each:
- 16.00 12.00
- 14.00 10.50

Buy 4 bottles, price each:
- 36.00 27.00
- 33.00 24.75

Buy 4 bottles, price each:
- 44.00 33.00

Buy 4 bottles, price each:
- 42.00 31.50
- 37.00 27.75

Buy 4 bottles, price each:
- 24.95 18.71
- 21.00 15.75

Buy 4 bottles, price each:
- 29.00 21.75

Buy 4 bottles, price each:
- 28.00 21.00
- 24.00 18.00

Buy 4 bottles, price each:
- 29.00 21.75

Buy 4 bottles, price each:
- 26.00 19.50
- 22.50 16.88

Buy 4 bottles, price each:
- 29.50 22.46

Buy 4 bottles, price each:
- 46.00 34.50
- 43.50 32.63

Buy 4 bottles, price each:
- 29.00 21.75

Buy 4 bottles, price each:
- 48.00 36.00
- 44.00 33.00

Buy 4 bottles, price each:
- 25.00 18.75

Buy 4 bottles, price each:
- 26.50 19.88

Buy 4 bottles, price each:
- 14.95 11.21
- 13.50 10.13

Buy 4 bottles, price each:
- 22.00 16.50
- 20.00 15.00

Buy 4 bottles, price each:
- 38.00 28.50
- 32.00 24.00

Buy 4 bottles, price each:
- 20.00 15.00

Buy 4 bottles, price each:
- 18.00 13.50

Buy 4 bottles, price each:
- 9.50 7.13
- 28.50 21.90

Buy 4 bottles, price each:
- 38.00 28.50

Buy 4 bottles, price each:
- 28.00 21.00

Buy 4 bottles, price each:
- 25.00 18.75

Buy 4 bottles, price each:
- 20.00 15.00

Buy 4 bottles, price each:
- 38.00 28.50

Buy 4 bottles, price each:
- 26.50 19.88

Buy 4 bottles, price each:
- 8.81 6.61

Buy 4 bottles, price each:
- 9.00 6.75

Buy 4 bottles, price each:
- 7.88 5.91

Buy 4 bottles, price each:
- 7.13 5.35

Buy 4 bottles, price each:
- 10.50 7.88

Buy 4 bottles, price each:
- 9.75 7.31

Buy 4 bottles, price each:
- 13.00 9.75

Buy 4 bottles, price each:
- 26.00 19.50

Buy 4 bottles, price each:
- 23.00 17.25

Buy 4 bottles, price each:
- 20.00 15.00

Buy 4 bottles, price each:
- 15.00 11.25

Buy 4 bottles, price each:
- 12.00 9.00

Buy 4 bottles, price each:
- 11.25 8.43

Buy 4 bottles, price each:
- 10.25 7.69

Buy 4 bottles, price each:
- 11.75 8.81

Buy 4 bottles, price each:
- 8.81 6.61

Buy 4 bottles, price each:
- 7.88 5.91

Buy 4 bottles, price each:
- 7.13 5.35

Buy 4 bottles, price each:
- 10.50 7.88

Buy 4 bottles, price each:
- 9.75 7.31
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**SUB-TOTAL OF COLUMN 9**

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**SUB-TOTAL OF COLUMN 10**

To order call: 1.954.766.8433 or 1.800.544.4440
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**SUB-TOTAL OF COLUMN 12**

**PARTICLE SIZE**

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

**OCTOBER 2013**

To order online visit: www.LifeExtension.com

- ACETYL-L-CYSTEINE
- 60 veg. caps 13.00 9.75
- 600 mg, 60 veg. caps 14.00 10.50
- 600 mg, 60 veg. caps 14.00 10.50
- 600 mg, 60 veg. caps 14.00 10.50
- 600 mg, 60 veg. caps 14.00 10.50
- 600 mg, 60 veg. caps 14.00 10.50

**SUB-TOTAL OF COLUMN 11**

**SUB-TOTAL OF COLUMN 12**
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<td>27.00</td>
<td>20.25</td>
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<td>Buy 6 bottles, price each</td>
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<td>01423</td>
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<td>Buy 4 boxes, price each</td>
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<td>01500</td>
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<td>PQG CAPS W/BIOPQQ® - 20 mg, 30 veg. caps</td>
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<td>PREGNENOLONE - 50 mg, 100 caps</td>
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<td>00700</td>
<td>PREGNENOLONE - 100 mg, 100 caps</td>
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**SUB-TOTAL OF COLUMN 13**

**SUB-TOTAL OF COLUMN 14**

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*OCTOBER 2013*  
*LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS*
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<td>(DI) RIBOSE TABLETS - 100 veg. tabs</td>
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<td>01609</td>
<td>RICH REWARDS® BREAKFAST GROUND COFFEE - 12 oz. bag</td>
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<td>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE - 12 oz. bag</td>
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<td>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE - 12 oz. bag</td>
<td>15.00</td>
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<td>01610</td>
<td>RICH REWARDS® DECAFERATED ROAST GROUND COFFEE - 12 oz. bag</td>
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<td>01712</td>
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<tr>
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<td>RICH REWARDS® CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
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<td>01531</td>
<td>RICH REWARDS® (SPICY) CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
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<td>01705</td>
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<td>01208</td>
<td>A-LIPIC ACID (SUPER) - 300 mg, 60 veg. caps</td>
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<td>RNA CAPSULES - 500 mg, 100 caps</td>
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<td>01432</td>
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<td>01679</td>
<td>SE-METHYL L-SELENOCYSTEINE - 200 mcg, 100 veg. caps</td>
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<td>SERAFILAZyme - 100 tablets</td>
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<td>SHARK LIVER OIL (NORWEGIAN) - 1000 mg, 30 softgels</td>
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<td>SILYMARIN - 100 mg, 50 veg. caps</td>
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**SUB-TOTAL OF COLUMN 15**

**SUB-TOTAL OF COLUMN 16**

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

**OCTOBER 2013**
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<td>TRUFLORA PROBIOTICS &amp; ENZYMES - 32 veg. caps</td>
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<td>L-TRYPTOPHAN - 500 mg, 90 veg. caps</td>
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<td>01721</td>
<td>TRYPTOPHAN PLUS (OPTIMIZED) - 90 veg. caps</td>
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<td>01716</td>
<td>TWO-PER-DAY - 60 tablets</td>
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<td>LTYROSINE - 500 mg, 100 tablets</td>
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<td>VINPOCETINE - 10 mg, 100 tablets</td>
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<td>VITAMIN B5 - 500 mg, 100 caps (Pantothenic Acid)</td>
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<td>VITAMIN B12 - 500 mcg, 100 lozenges</td>
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<td>VITAMIN C (BUFFERED) POWDER - 454.6 grams</td>
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<td>(EFFERVESCENT) VITAMIN C-MAGNESIUM CRYSTALS - 180 grams</td>
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<td>VITAMIN D3 - 2000 IU, 1 fl oz, Mint flavor</td>
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** These products are not 25% off retail price.
** Not eligible for member discount or member renewal product credit.
*** Due to license restrictions, this product is not for sale to customers outside of the USA.
† Member pricing not valid on this item.
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City ST ZIP

Email Phone

☐ Check enclosed (payable to Life Extension Foundation®)

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SUB-TOTAL COLUMN 1
SUB-TOTAL COLUMN 2
SUB-TOTAL COLUMN 3
SUB-TOTAL COLUMN 4
SUB-TOTAL COLUMN 5
SUB-TOTAL COLUMN 6
SUB-TOTAL COLUMN 7
SUB-TOTAL COLUMN 8
SUB-TOTAL COLUMN 9
SUB-TOTAL COLUMN 10
SUB-TOTAL COLUMN 11
SUB-TOTAL COLUMN 12
SUB-TOTAL COLUMN 13
SUB-TOTAL COLUMN 14
SUB-TOTAL COLUMN 15
SUB-TOTAL COLUMN 16
SUB-TOTAL COLUMN 17
SUB-TOTAL COLUMN 18

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POSTAGE AND HANDLING (ANY SIZE ORDER, CONTINENTAL U.S.) $5.50

C.O.D.s (ADD $7 FOR C.O.D. ORDERS)

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

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

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CHECK HERE FOR C.O.D. ORDERS

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CHECK HERE FOR UPS RED LABEL (OVERNIGHT)

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

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Local Number: 954-766-8433
**BIBLIOGRAPHY**

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<td>Disease Prevention and Treatment. Expanded Fifth Edition (hardcover) Until January 31, 2014</td>
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<td>$69.95</td>
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<td>The Vitamin D Solution • by Michael F. Holick, PhD, MD (paperback)</td>
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<td>The South Beach Diet Gluten Solution • by Dr. Arthur Agatston</td>
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<td>Young for Life • by Marilyn Diamond and Dr. Donald Schnell</td>
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A Partnership in Heart Health

New Chapter Zyflamend & Life Extension Super Omega-3

A Holistic Approach to Cardiovascular Health

Maintaining heart health and a strong cardiovascular system are vital to a healthy body. Diet and exercise are the most important factors. Scientists and doctors both agree that a program of preventive health today is preferable to a treatment program tomorrow. But unfortunately, most Americans don’t eat enough heart-healthy foods or get enough exercise. We now know that there are several additional factors that can support cardiovascular health, including:

• Supporting the body’s healthy inflammation response*
• Consuming “good fats” such as Omega-3 fatty acids

What is the Inflammation Response?

Our body’s inflammation response is a natural healing process. We often think of the inflammation response as something we can feel—such as in our joints and muscles where there are large numbers of sensitive nerve endings. But we can also have a response we can’t feel, where sensitive nerves aren’t concentrated—including in the heart and blood vessels. Whether we’re aware of it or not, this inflammation response can affect every organ and cell.

Extensively Researched Herbal Blend

New Chapter’s Zyflamend represents a scientific breakthrough in supporting a healthy inflammation response.* Zyflamend is formulated based on a large body of scientific research showing its ten herbs and spices contain hundreds of plant compounds that support a healthy inflammation response.* Just as important as a daily multivitamin, Zyflamend is the patented herbal protocol to help your whole body’s natural inflammation process stay balanced and healthy every day.* Zyflamend has been studied at leading research institutions and shown to benefit multiple areas of health, including heart health.*

Omega-3 is Important for Cardiovascular Health

Life Extension’s Super Omega-3 is a premium, scientifically validated fish oil concentrate. Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract promotes a healthy heart.* 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.* 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.*

1. Biochem Biophys Acta. 2004 Jun 1;1682(1-3):80-91

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

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* According to 2011 SPINS® Market Research

**Supportive but not conclusive evidence shows that consumption of EPA and DHA Omega-3 fatty acids may reduce the risk of coronary heart 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.
Quantity does not necessarily mean quality.

It is not just how many CFU, but how much lactic acid is produced that makes a probiotic effective.

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Call your Life Extension® advisor to learn more. Call Life Extension to place your order today. 1-800-544-4440

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Commercial companies go to extreme lengths to keep customers from reaching a human on the phone. The result is that dialing a business can become a stressful event.

Consumers nowadays are forced to listen to recordings, choose buttons to reach the right department, listen to recorded ads, and after much frustration, might reach a person that can help them.

At Life Extension, we have always answered our phones with trained live operators to efficiently handle your call, or immediately transfer you to a knowledgeable health advisor.

If you dial 1-800-544-4440 you will get a live person 24 hours a day, every day. The only rare exception is if we are temporarily overwhelmed at that particular moment. You’ll never need to guess which button to push because at Life Extension we answer with competent humans.

Life Extension has never erected a barrier to keep members from reaching us and never will. It’s one of those irrevocable policies embedded in the philosophy of our 33-year-old organization.

So if you have a health question, need to check on an order, place an order or require any kind of member support service, just call 1-800-544-4440 any time of the day, night, weekend, or holiday. If you hear that a hurricane has wiped out South Florida, don’t worry, we have redundant phone capacity in other locations.

Since 1980, we have made interacting with Life Extension a pleasant experience. Longtime members know this and often comment that our customer service is the world’s finest. In reality, commercial companies have made it so miserable for their customers to reach them that it’s not hard to be better. We at Life Extension view live operator service as a common courtesy that should exist everywhere.
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