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In the October 1992 issue of this publication, I wrote an article about the cancer prevention potential of green tea extract. I based my article on about 100 scientific papers.

If you search the National Library of Medicine database today, you’ll find over 1,000 studies relating to green tea and overall cancer prevention.

In June 2005, the FDA went to considerable effort to publish a position paper stating: “…it is highly unlikely that green tea reduces the risk of prostate cancer.”

This prompted me to write a rebuttal in the November 2005 issue of this magazine exposing flaws and omissions in the FDA’s report.

The most egregious omission was a study presented at the 96th American Association for Cancer Research Meeting, where men with premalignant prostate disease where given 600 mg a day of a green tea extract supplement or placebo. The men taking green tea extract were 90% less likely to progress to prostate cancer compared to the placebo group after one year.

While this study was relatively small, the FDA pretended as if this favorable data did not exist when disseminating their report questioning whether green tea had cancer protective effects.

The FDA later attacked a maker of green tea leaves that dared to state on their label: “green tea may prevent prostate and breast cancer.”

As reported in the July 2012 issue of this publication, a Federal Court ruled against FDA’s attempt to censor an anti-cancer claim on the box of these green tea leaves.

Move forward to 2017 and the totality of evidence supporting a role for green tea in cancer prevention has greatly expanded.
When this study evaluated green tea polyphenol (catechin) intake, there was an associated 62% reduction in prostate cancer risk based upon three randomized controlled human trials.\(^5\)

Located in Tampa, Florida, Moffitt is one of 47 National Cancer Institute-designated Comprehensive Cancer Centers.\(^6\) It conducts clinical trials related to cancer prevention and control. Moffitt is ranked as one of the top conventional cancer hospitals in the Southeastern United States.

A team of Moffitt researchers conducted a randomized trial to assess the safety and effectiveness of the active components in green tea to prevent prostate cancer development in men who have premalignant lesions.

According to the Moffitt researchers:

“Laboratory studies have shown that substances in green tea called ‘catechins’ inhibit cancer cell growth, motility and invasion, and stimulate cancer cell death. Green tea catechins also prevent and reduce tumor growth in animal models. Epigallocatechin-3-gallate (EGCG) is the most abundant and potent catechin found in green tea responsible for these cancer prevention effects.”\(^7\)

The goal of the Moffitt clinical trial was to evaluate if a one-year intervention with green tea catechins could suppress prostate cancer development in men who had high-grade intraepithelial neoplasia or atypical small acinar proliferation.

The Moffitt researchers used decaffeinated green tea capsules that contained a mixture of catechins that predominantly consisted of EGCG at a dose of 200 mg twice a day.
In this study, green tea extract capsules were compared to placebo pills in men with premalignant prostate lesions over a 1-year treatment period. Overall, the difference in the number of prostate cancer cases at the end of one year between the two treatment groups was not statistically significant.

However, in men who only had high-grade intraepithelial neoplasia at the beginning of the trial, there was a lower rate of progression to prostate cancer and development of atypical small acinar proliferation in the group taking green tea extract capsules.

Atypical small acinar proliferation reflects a broad group of prostate lesions with insufficient changes in the cells to definitively diagnose prostate cancer.

In this study, men receiving the green tea extract had a decrease in PSA (prostate-specific antigen) levels, which is an indicator of reduced prostate cancer risk.

The title of the Moffitt Cancer Center press release was:

“Component in Green Tea May Help Reduce Prostate Cancer in Men at High Risk”

While we at Life Extension® are gratified to see mainstream cancer researchers conduct this study, a higher dose of green tea extract may have produced better results, as was shown in an earlier 2006 study that used 600 mg a day.

A challenge in interpreting published studies about green tea is different doses, different study durations and other factors that make it challenging to reach consistent outcomes. Most reports conclude with the researchers stating, “More human studies are needed.”

We at Life Extension don’t disagree about the value of more human studies. The undeniable fact is that more than 160,000 American men will be diagnosed with prostate cancer this year.

If a high-potency green tea extract capsule could reduce these prostate cancer numbers anywhere near what some studies indicate, this would have an enormous beneficial impact on the health of aging men.

Don’t Forget About Diet

It is important to never rely on any single nutrient to reduce cancer risk. As has been extensively written in Life Extension Magazine®, one’s overall diet has an enormous impact on prostate and other cancer risk.

The box on the next page is a summary we published in 2016 showing marked prostate cancer risk reductions in response to healthier eating patterns.

Reviewing these findings reveals the challenges in clinical studies that seek to assess if a single nutrient prevents cancer and other diseases. For instance, if too many men in a small study group are overeating cancer-causing foods, it could negate what effect the nutrient is really having.
Foods That Feed Prostate Cancer

A number of studies have evaluated the impact of a man’s diet on his subsequent risk of prostate cancer. Other studies reveal that even after a man is diagnosed with prostate cancer, what he eats has a huge effect on survival outcomes and disease progression. Here are some published findings we reported on last year:

The results of a small study showed that markers of prostate cancer were reversed in patients with clinically relevant disease who made comprehensive lifestyle changes. Such changes included eating a diet low in fat, but rich in fruits and vegetables, along with regular exercise.13

The findings showed that in the control group, PSA levels increased, indicating progression (worsening) of their disease. In the comprehensive lifestyle change group, PSA levels decreased, indicating a probable regression of their prostate malignancies. Those who complied most with the healthy lifestyle changes had the greatest reductions in PSA blood levels.

Most interesting from this same study was a finding that took blood serum from the participants and added it to a petri dish of dividing human prostate cancer cells. Recall both groups consisted of men with clinically relevant prostate cancer.

Serum from the control group inhibited tumor growth by 9%, whereas serum from the comprehensive lifestyle group inhibited tumor growth an astounding 70%.13

This discovery indicates that healthy lifestyle choices result in the blood of a prostate cancer patient gaining powers that impede tumor growth.

A larger study consisted of 926 men with non-metastatic prostate cancer who were evaluated over a median 10-year period.14

The diets of these men were categorized either as a “prudent” pattern (characterized by a higher intake of vegetables, fruits, fish, legumes, and whole grains) or as a “Western” pattern (characterized by a higher intake of processed foods and red meats, as well as high-fat dairy products and refined grains).

In these 926 men with clinically diagnosed prostate cancer, those who consumed the “Western” pattern diet had a 2.53-fold increase in prostate cancer-specific mortality. This was especially evident for men who consumed the most saturated fat compared to polyunsaturated vegetable fats.14

Secondary analysis of the data by the same group of researchers found that men who consumed more than three servings of dairy foods daily had a 76% higher all-cause mortality risk and 141% higher prostate cancer-specific risk compared to men who consumed less than one serving a day of dairy food.15

Another published study evaluated levels of carotenoids and vitamin E in the blood of men with recurring prostate cancer as evidenced by rising PSA. These men were previously treated with surgery or radiation but had recurring disease based on steadily elevating PSA blood levels. After three months, men with higher blood levels of lutein and zeaxanthin showed lower PSA results. After six months, men with higher blood levels of vitamin E, lycopene, and cryptoxanthin had lower PSA readings.16

The researchers who conducted this study concluded that “…greater intake of foods containing these micronutrients might be beneficial to men with PSA-defined PrCA [prostate cancer] recurrence.”16

A study of men residing in rural Pakistan found that frequent consumption of red meat and fat increased prostate cancer risk 3.4-fold. This same study showed that greater consumption of vegetables, fruit, and fluids decreased prostate cancer risk by 79% to 91%.17

When dietary patterns of Iranian men were evaluated in another study, there was a strong protective effect against prostate cancer in response to higher intakes of fruits and vegetables. Men in the highest intake range of plant foods like cabbage, tomatoes, apples, and pomegranate had a 67% reduced prostate cancer risk.18

A study of Italian men looked at dietary patterns and their association with a man’s odds of developing prostate cancer. Men who ate the most animal products or starchy foods had a 1.5-fold increased rate of prostate cancer. Men whose diets contained the most vitamins and fiber had a 7% decreased risk.19

These studies emanating from around the world consistently show prostate cancer risk reductions in response to healthy dietary practices. Those with pre-existing prostate cancer should pay particular attention to these findings.
A fascinating article in this month’s issue describes new data showing those who consume green tea not only have lower cancer rates, but suffer fewer degenerative illnesses and live longer.

Another article reveals that nutrients like lutein used to protect against macular degeneration also improve night vision. We were the first to introduce lutein as a supplement back in 1985.

The article on page 76 further corroborates what we have long known, i.e., magnesium deficiency worsens insulin resistance, an underlying cause of type II diabetes.

Of particular interest to all of you is the article on page 24 that describes a new beverage that can function as an “alternative to coffee.”

Clinical studies reveal how this novel cocoa-spearmint drink mix boosts mental sharpness, focus, and attention, while improving microvascular circulation in the brain.

Every time you purchase a blood test, dietary supplement, or other product advertised in this magazine, you help us contribute more funds towards human age-reversal research endeavors.

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Item #01907 • 90 vegetarian capsules

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Eye Nutrients Linked to Efficient Brains

An article in the Journal of the International Neuropsychological Society reports an association between higher levels of the carotenoids lutein and zeaxanthin and better brain efficiency.*

The finding was obtained from a University of Georgia study that involved 43 men and women between the ages of 65 and 86. Lutein and zeaxanthin levels were determined from measurement of macular pigment optical density and blood sample analysis. Participants were asked to recall learned pairs of unrelated words while undergoing functional magnetic resonance imaging to evaluate brain activity.

The researchers found an association between higher lutein and zeaxanthin levels and lower blood oxygen level-dependent signaling in a number of areas of the brain, which indicates that less brain activity was required for the memory task.

"The observed results suggest that L [lutein] and Z [zeaxanthin] promote cognitive functioning in old age by enhancing neural efficiency," the authors conclude.

Editor’s Note: “There’s a natural deterioration process that occurs in the brain as people age, but the brain is great at compensating for that,” explained first author Cutter Lindbergh. “One way it compensates is by calling on more brain power to get a job done so it can maintain the same level of cognitive performance.”

“It’s in the interest of society to look at ways to buffer these declining processes to prolong functional independence in older adults,” he noted. “Changing diets or adding supplements to increase lutein and zeaxanthin levels might be one strategy to help with that.”

In The News

**Autistic Children Benefit From Vitamin D3**

Findings from a randomized trial involving children with *autism spectrum disorder* (ASD) revealed improvement in symptoms of the disorder among those who received *vitamin D3* supplementation.*

“This study is the first double-blinded, randomized, controlled trial proving the efficacy of vitamin D3 in ASD patients,” the authors announced.

The trial included 85 boys and 24 girls between the ages of 3 and 10 years diagnosed with ASD. The children were randomized to receive for four months either 300 IU of vitamin D3 per kilogram daily or a placebo. Serum 25-hydroxyvitamin D levels, autism severity and social maturity were assessed at the beginning and end of the study.

“Autism symptoms—such as hyperactivity, social withdrawal, and others—improved significantly following vitamin D3 supplementation but not after receiving the placebo,” reported lead author Dr. Khaled Saad of Egypt’s Assiut University.

**Editor’s Note:** “Depending on the parameters measured in the study, oral vitamin D supplementation may safely improve signs and symptoms of ASD and could be recommended for children with ASD,” the authors conclude.

In a study published in the journal *Cell*, researchers describe a process whereby reprogramming cells to a younger state can reverse aspects of aging.*

By inducing the expression of four genes known as the Yamanaka factors, any cell can become a pluripotent stem cell which, similar to an embryonic stem cell, is capable of dividing without limit and becoming any cell type.

Although there are dangers in unchecked cell growth, such as cancer, the potential anti-aging benefits for humans are astounding.

In the research, Yamanaka factors were induced for a short period of time in the skin cells of mice with the aging disease progeria. The remarkable results: not only did the mice appear younger, but organ and cardiovascular function improved. They also lived 30% longer than untreated mice and did not develop cancer.

Normal older mice were also treated. This group saw improvement in the regeneration capacity of the pancreas and muscles.

“Our study shows that aging may not have to proceed in one single direction,” stated senior author Juan Carlos Izpisua Belmonte. “It has plasticity and, with careful modulation, aging might be reversed.”

**Editor’s Note:** “In other studies, scientists have completely reprogrammed cells all the way back to a stem-cell-like state,” said co-first author Pradeep Reddy. “But we show, for the first time, that by expressing these factors for a short duration you can maintain the cell’s identity while reversing age-associated hallmarks.”

* *Cell*. 2016 Dec 15;167(7):1719-1733.e12.
A study conducted by Medical College of Qingdao University has found an improvement in indicators of insulin resistance in middle-aged individuals who supplemented with magnesium and chromium.*

One hundred twenty insulin resistant subjects between the ages of 45 to 59 were divided into groups who received 160 mcg per day of chromium, 200 mg per day of magnesium, chromium plus magnesium, or a placebo for three months. Fasting blood glucose, fasting insulin, insulin resistance index, and T-lymphocyte messenger RNA levels of glucose transporter 4 (GLUT4, a protein that transports glucose) and glycogen-synthase-kinase-3β (GSK-3β, an enzyme) were determined before and after treatment.

In the group that received both magnesium and chromium, fasting blood glucose, fasting insulin, insulin resistance index, and GSK-3β were significantly lower at the end of the study. Additionally, a 2.9-fold increase in GLUT4 was observed only among those who received both minerals.

Editor’s Note: "GLUT4 and GSK-3β are important components in an insulin-induced signal transduction pathway that plays a key role in glucose metabolism," authors Mei Dou, PhD, and colleagues explain. "Increased expression of GLUT4 has been associated with enhanced glucose translocation from the exterior to the interior of cells in insulin-sensitive tissues and repression of GSK-3β has been shown to enhance insulin receptor activity. "The results of the present study suggest the therapeutic potential of combined chromium/magnesium therapy in insulin resistant individuals."

Calcium Supplementation Safe for Hearts

The journal *Annals of Internal Medicine* has revealed a new evidence-based guideline from the National Osteoporosis Foundation and the American Society for Preventive Cardiology which affirms that calcium from supplements or food that doesn’t exceed the tolerable upper intake level of 2,000 to 2,500 mg per day is safe for the heart.*

The updated guideline is the result of a review of four randomized trials and 27 studies conducted by a team from Tufts University Medical School.

Among clinical trials there was no statistically significant difference in cardiovascular disease risk or mortality between subjects who received calcium in comparison with the placebo groups. No cohort study conclusively linked calcium intake—whether from diet, supplements or both—to cardiovascular disease or mortality from any cause.

Editor’s Note: “On the basis of our assessments of internal validity, precision of risk estimates, and consistency of results from randomized trials and prospective cohort studies, we conclude that calcium intake (from either food or supplement sources) at levels within the recommended tolerable upper intake range is not associated with cardiovascular disease risks in generally healthy adults,” Mei Chung, MPH, PhD, and colleagues write.

Super R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels.

CAUTION: If you are taking glucose-lowering medication, consult your health care provider before taking this product.

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Bone Restore with Vitamin K2 combines skeletal-strengthening nutrients in one highly-absorbable formula.

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

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Shade Factor™ Spray is easy to apply and looks transparent on the skin. This new spray sunscreen provides broad-spectrum UV protection along with botanical ingredients in a cooling mist.

For full product description and to order Shade Factor™ Sunscreen Spray, call 1-800-544-4440 or visit www.LifeExtension.com.
A NATURAL ALTERNATIVE TO COFFEE
Each morning, about 64% of adult Americans consume at least one cup of coffee.¹

The brain responds by releasing noradrenaline that provides a quick energy boost. This is often followed by a “caffeine letdown” whereby noradrenaline in the brain is depleted and subsequent coffee fails to provide sufficient mental boost.

According to a recent poll, 26% of Americans say they are addicted to coffee.¹ Some wish they could quit for a few weeks to regain the energy-boost that coffee previously provided.

For many people, brain fog develops in mid-to-late afternoon. Others find it difficult to focus clearly upon awakening.

A healthy alternative to coffee has been shown to quickly reverse mental deficits. Those who experience brain fatigue in the morning or later in the day now have a pick-me-up alternative that also improves brain focus and clarity.

**Coffee Has Beneficial Effects**

Coffee beans contain polyphenols such as chlorogenic acid that have demonstrated health benefits.

For some people, even decaf creates discomforts like heartburn and excess nerve stimulation.

For those who don’t want to reach for a cup of coffee, the combination of cocoa and spearmint is a great alternative for erasing brain fog and achieving mental clarity.
Natural compounds have been clinically demonstrated to improve attention and concentration by preserving brain neurotransmitters (such as noradrenaline).

A proprietary spearmint extract combined in cocoa powder can now be mixed into a convenient beverage. It can be used for precisely those times when we need a boost to mental sharpness, focus, and attention.

In addition, cocoa powder promotes micro-vascular blood flow in the brain, assuring moment-by-moment oxygenation to brain regions needed for focus and working memory.

**Cognitive Benefits of Spearmint**

Spearmint leaves have long been used in cuisine and to produce a soothing, refreshing scent associated with relaxation. Studies now show that spearmint can “wake up” the brain and boost cognitive function.

Two recent scientific studies reveal the powers of a group of phenolic compounds found in a proprietary extract of spearmint. Results showed that the spearmint improved attention, concentration, and brain function.

The first study was an open-label (no control group) pilot study among 11 healthy adults, average age 59. All subjects had self-reported memory impairment at baseline.

Subjects received 900 mg of a spearmint extract once daily with breakfast for 30 days.

Subjects underwent an acute evaluation to determine the immediate effects of the supplement. The computerized cognition tests began one hour before the first dose, and again at 2.25 and 4 hours after the dose. This battery of cognitive tests measured memory, reasoning, attention/concentration, and planning.

On two acute tests of attention and concentration measuring working memory, subjects demonstrated significant improvements over baseline at 2.25 hours, and again at four hours, following a single dose of the spearmint extract.

By 4 hours, a 46% improvement was demonstrated on one task, with a 121% improvement on the other.

In this same study group using a test evaluating planning abilities, subjects showed a 39% improvement over baseline at four hours.

Long-term tests, conducted after 30 days of daily supplementation, also showed significant overall improvements.

On a test of reasoning, subjects showed a 35% improvement over baseline scores, and on a second test measuring attention and concentration, they showed an impressive 125% improvement.

The researchers also measured a 48% increase in planning ability that was reported as a “trend” toward improvement.

**Controlled Clinical Trial of Spearmint Extract**

A larger, randomized, double-blind, placebo-controlled study followed after the first was published, which further demonstrated the brain benefits of this spearmint extract.

In this study, 90 subjects, average age 59—with known age-associated memory impairment but not dementia—were enrolled.

One of the study’s target outcomes was the effect of the extract on subjects’ working memory. This is important because good “working memory” enables multiple memories/sensory inputs to be integrated to direct decisions and reactions.

Subjects received the spearmint extract daily with breakfast for 90 days at one of two doses, 900 mg or 600 mg, or placebo. The extract was standardized to contain 14.5% rosmarinic acid, one of spearmint’s important components.

At day zero, and on days 45 and 90, subjects underwent a battery of computerized tests of cognitive performance.
The study results found that, by day 90, subjects taking the 900-mg supplement dose had a significant 3-time improvement in the quality of their working memory compared with placebo recipients. This indicates alert brain function.

The lower-dose (600 mg) group showed a non-significant improvement over baseline.

Another cognitive test measured spatial working memory (the ability to know where items are arranged in space, and how to use this information). People on the 900 mg/day supplement dose demonstrated a nearly 3-times improvement compared to the placebo.

Of additional interest, the higher-dose (900 mg) group also showed significant improvements in their sleep patterns, with increased ease in getting to sleep, and better alertness and behavior following awakening.

Together these clinical trials provide compelling support for this novel spearmint extract on helping individuals stay focused and on-task by boosting working memory capacity—under both acute and chronic circumstances.

What You Need to Know

Spearmint and Cocoa for Brain Performance

- That afternoon low point in mental sharpness, focus, and attention is something most of us have learned to live with.
- Some reach for another cup of coffee, but at this time of day that extra cup could cost them valuable sleep.
- Human studies have demonstrated that a group of phenolic compounds from spearmint can enhance performance on tests of working memory, the critical factor in sustaining attention and focus during problem solving.
- Cocoa powder was recently shown to significantly improve the match between brain cell activity and brain blood flow, an important requirement for crisp mental function that also correlates with resistance to developing dementia.
- Spearmint extracts have now been added to a high-quality cocoa powder to provide a boost for attention and mental focus, capitalizing on the benefits of each natural compound.
- There is no longer any reason to tolerate morning grogginess or the “four o’clock fade.” A cup of spearmint hot chocolate may be just the right prescription for sustained brain performance throughout the day.
Cocoa Improves Brain Focus and Blood Flow

**Cocoa** (without sugar) is a beverage with a reputation for producing comfort and relaxation. A recent clinical study has demonstrated the benefits of cocoa powder on brain focus in humans. In addition, scientists evaluated a microvascular phenomenon called neurovascular coupling. This beneficial effect occurs when tiny blood vessels dilate (open-up) to deliver more blood to brain regions where increased cellular activity is required.

Sixty adults, average age 73, participated in a double-blind, randomized clinical trial. All subjects were hypertensive or had well-controlled type II diabetes.

Subjects were randomly assigned to receive a cocoa beverage that was either rich in flavanols or deficient in flavanols, consuming two cups of the assigned drink daily for 30 days.

All subjects had measurements of their neurovascular coupling and cognitive function at baseline and on days one and 30 after beginning the cocoa consumption.

What this study demonstrated was that, at 24 hours, subjects with impaired baseline neurovascular coupling had a 10.6% improvement in neurovascular coupling, and, by 30 days, these subjects’ performance on a test requiring attention significantly improved.

The baseline time to complete this test was 167 seconds (more than 2.75 minutes), while after 30 days of supplementation that time was just 116 seconds (less than two minutes), a 51-second gain. Clearly, the cocoa beverage was speeding up brain function and alertness.

This study’s important contribution is that it showed how cocoa supplementation can boost brain blood flow in response to need (defined as neurovascular coupling), that directly affects our ability to focus and pay attention, even over the short term.

The study also found, somewhat surprisingly, that the flavanol-rich and the flavanol-poor cocoa drinks produced the same effects, showing that something other than flavanols was responsible for the observed improvements.

Another study enrolled 20 young adults (average age 33) who were randomly assigned to receive 11.6 grams of cocoa powder, a mix of caffeine and theobromine (components of cocoa), or a placebo.

This study focused on the immediate, short-term cognitive effects of cocoa consumption, with cognitive function tests administered before treatment, and one and two hours after treatment.

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**What is Working Memory?**

Many studies of cognition report on something called **working memory**. We can think of working memory as akin to our desktops (real or on a computer). It is the “space” where we hold various bits of information while we compare them with each other, eventually developing a plan for how to respond to a given situation. All of this takes place in the blink of an eye, and we are not ever conscious of the complex interactions going on deep in our brains.

For example, a driver approaching a red light puts “red light” in working memory, and then pulls out “filed” information about what a red light means. That in turn triggers further associations, so that the driver adds “car approaching from the right,” the current speedometer indication, road conditions, and myriad other facts, and then integrates them in an orderly way, resulting in an apparently automatic response to press the brake pedal, continue scanning for traffic, a glance in the rearview mirror, and all the other mental and motor tasks required to bring the car to a safe stop ahead of the intersection.

Loss of working memory, then, impairs our ability to operate safely and efficiently in an ever-changing world, and contributes to the confusion, momentary disorientation, and uncertainty that plague so many of us as we age.

Improvements in working memory are therefore measurable gains in an individual’s ability, not only to cope, but to thrive as an independent-living adult.
The study showed that, compared to placebo, cocoa powder significantly shortened reaction time and boosted alertness in a test that required focus, attention, and concentration. The results suggest that the small amount of naturally occurring caffeine + bioactives of cocoa called theobromine are responsible for cocoa powder’s impact on alertness and mood.

The study tested various aspects of enhanced brain functioning such as reaction time, rapid visual information processing and energetic arousal and found that all were improved with the ingestion of the cocoa powder and its components.

Together, these studies show that cocoa produces near-immediate improvements in the cognitive functions when we need to pay attention, to focus, and to concentrate. These are all measures of improved working memory.

Spearmint and Cocoa Effects on Brain

While many details are still under investigation, it is clear that natural compounds found in spearmint extract and in cocoa powder exert potent activity, not only on brain cells, but also on the vascular structures that support and nourish them.

Phenolics present in spearmint inhibit the acetylcholinesterase enzyme, resulting in higher concentrations of the neurotransmitter acetylcholine, which is critical for memory and cognitive function. As a result, greater amounts of the neurotransmitter are available to brain cells in memory-intensive portions of the brain.

In a mouse study, a spearmint phenolic, rosmarinic acid, was shown to provide continued neuroprotection for key memory centers of the brain (e.g., hippocampus and cortex), against the cellular damage caused by oxidative stress.

Even more exciting, rosmarinic acid and the other phenolics present in spearmint induce the expression of essential growth factors that promote formation of new brain cells.

In particular, rosmarinic acid was shown to significantly enhance new cell growth in cultures of cells from the working memory center of the brain, the hippocampus.

Cocoa also contains polyphenols that have been shown to improve performance on tests of cognition in animal models.

Cocoa has the ability to improve neurovascular coupling, the matching of blood flow to the areas of the brain being called on to perform cognitive tasks.

Unique Properties of Spearmint Extract K110-42

Modern science has unraveled many of the secrets of spearmint, which is rich in phenolic compounds, like rosmarinic acid.

Research reveals that such phenolic compounds inhibit an enzyme, acetylcholinesterase, that breaks down the vital memory-associated neurotransmitter acetylcholine.

As a result, greater amounts of the neurotransmitter are available to brain cells in memory-intensive portions of the brain.

Spearmint phenolic compounds are also potent oxidative stress-preventives, helping to protect brain cells from direct oxidative damage.

A proprietary mix of spearmint phenolic compounds, sourced from patent-pending, non-GMO lines of spearmint, known as K110-42, has now been grown for the express purpose of use in a cognition-enhancing supplement.

These spearmint lines have a distinct phytochemical composition that is significantly richer in rosmarinic acid and other phenolic compounds, compared with standard commercial spearmint.

The phenolic mix is extracted using a water extraction method and a patent-pending drying technique aimed at optimizing the phenolic content. This concentrates the important rosmarinic acid component more fully than does steam extraction.
A NATURAL ALTERNATIVE TO COFFEE

Summary

Recent human studies make a compelling case for taking a powdered drink mix of spearmint extract and cocoa powder. The combination seems ideal for use as an immediate pick-me-up beverage for those times when we could use better focus, attention, and concentration.

These plant-sourced ingredients have demonstrated brain-activating effects that provide cognitive benefits throughout the day.

For those who seek an alternative to coffee, or want to cut back their caffeine consumption, enjoying a cup of hot spearmint-cocoa may provide clearer thinking, better focus, and greater mental clarity.

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

References


Why is Neurovascular Coupling Important in the Brain?

Cocoa is rich in numerous phenolic and other bioactive compounds, and has recently been found to have a specific beneficial effect on neurovascular coupling, a measure of how well blood flow matches brain cell activity in tiny regions of the brain.17-19

Strong neurovascular coupling suggests that blood flow is well matched to those brain areas that need fresh oxygen and nutrients.

It is now known that those with impaired neurovascular coupling are more likely to have cognitive decline, and, furthermore, that deterioration of neurovascular coupling precedes measurable impairment in cognitive function during brain aging.20,21

So, any therapy that can restore normal neurovascular coupling may indeed help to slow the onset or progression of these dreaded conditions.
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.

**ArthroMax® Advanced with UC-II® & AprèsFlex®** is a multinutrient formula that supports healthy joint function.

Two clinically validated ingredients in this formula: AprèsFlex® and UC-II® maintain cartilage and ease inflammation and thus may promote comfortable joint structure and function.

For full product description and to order **ArthroMax® Advanced with UC-II® and AprèsFlex®** call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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N-acetyl-L-cysteine supports healthy levels of glutathione, a molecule utilized by all cells for protection against free radical damage and attacks from foreign compounds.

Tap the Power of N-Acetyl-L-Cysteine To Boost Glutathione Levels

Caution: Those who supplement with NAC should drink six to eight glasses of water daily in order to prevent cysteine renal stones. Cysteine renal stones are rare but do occur.

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The Yummy Brain Booster

CocoaMind™ is a delicious (sugar-free) mix of cocoa with 900 mg of spearmint extract added to enhance thoughtful clarity.

As an alternative to coffee, CocoaMind™ can be tried as a hot drink in the morning, or later in the day for a mental energy boost.

For full product description and to order CocoaMind™, call 1-800-544-4440 or visit www.LifeExtension.com
Improve Night Vision
Night driving becomes increasingly difficult and dangerous with age, primarily related to changes in our vision and eye structures.

Many older people restrict their driving by avoiding high-risk situations, such as night driving.1

Here are three facts about the age-related visual loss:

• Even normal retinal aging limits our vision, especially in the dark.2

• Those with early age-related macular degeneration are 4.3 times as likely to report difficulty with night driving, 5-fold more likely to have trouble with near vision, and 2.7 times as likely to have difficulty with glare, compared with same-age people in normal retinal health.2

• At least 43% of people five years out from cataract surgery experience glare-related difficulties with driving.3

But one doesn’t have to accept the end of independence and mobility as one’s eyes age. Two new studies published in late 2016 offer hope for those of us still driving, especially at night.

Together, these studies provide new support for supplementing with macular carotenoids, natural pigments that we must consume in order to shield our vulnerable retinal cells from degeneration with age.

Those pigments, lutein, zeaxanthin and meso-zeaxanthin, have long been recognized for their importance in overall retinal protection.4-6

The new studies show that supplementation with these pigments provides targeted benefits important to night drivers, namely, how our eyes respond upon exposure to a bright light against a dark background.

This article will examine new studies showing lutein, zeaxanthin, and meso-zeaxanthin improve photostress recovery time and disability glare.

Based on these findings, it is apparent that even those of us with apparently normal vision should optimize their intake of the macular carotenoids like zeaxanthin, to see better.
Researchers wanted to determine the effects of **macular carotenoids** on the following measurable parameters related to **night driving**:

- **Photostress recovery** (how quickly retinal cells recover from intense exposure to bright lights)
- **Disability glare threshold** (the point at which subjects could no longer see a target through a glaring ring of light)
- **Macular pigment optical density** (density of the protective pigment layer)

In the first study, scientists recruited 59 healthy volunteers, average age of 22. They divided the subjects into three groups, each receiving a daily dose of:

- Placebo
- Lutein (10 mg), plus zeaxanthin (1 mg), plus meso-zeaxanthin (1 mg)
- Lutein (20 mg), plus zeaxanthin (2 mg), plus meso-zeaxanthin (2 mg)

The supplementation continued for one year, with measurements of macular pigment optical density, photostress recovery, and disability glare made at baseline (before supplementation), and at 6 and 12 months. The study found that **macular pigment optical density**, the measure of how much protective macular
pigment was present, increased significantly in both carotenoid-treated groups, compared with placebo recipients, both at six and at 12 months. Furthermore, both photostress recovery times and disability glare thresholds improved significantly from baseline in the supplemented groups, compared with placebo, at both follow up visits.

The study showed that supplementation with lutein, zeaxanthin, and meso-zeaxanthin, at either a low or a higher dose, substantially improved the protection of the volunteers’ eyes. Their visual performance improved under conditions similar to night driving: the ability to see a target despite bright, glaring lights around it was enhanced by the supplementation.

Interestingly, macular pigment optical density was significantly associated with both the glare and the photostress responses. This study showed that increases in macular pigment optical density enhance visual performance in bright light conditions, which in turn improves night vision.13

Effects in Older Study Subjects

The first study showed greater macular pigment optical density in young adults is associated with better vision under conditions of bright light and glare.

The second study looked at older people and demonstrated that blood levels of macular carotenoids are closely related to their density in the eye (macular pigment optical density).14 The researchers added an omega-3 fatty acid (DHA) to the zeaxanthin-lutein supplement.

This study involved 20 older patients (aged 57 to 71) with either wet macular degeneration or chronic central serious chorioretinopathy in one eye, with the other eye still healthy.14

All patients in this study received the same supplement, a combination of lutein and zeaxanthin, plus the omega-3 fatty acid DHA for a 6-month period.

Visual acuity (standard vision test) and contrast sensitivity (how well the subjects could discern differences in contrast) were measured at baseline and again at one, three, and six months into the study, while macular pigment optical density was calculated at each time point using photos of the retinas.14

What You Need to Know

Carotenoids Offer Potent Eye Protection

- Nighttime driving scares many older drivers because it can be so hard to see in the face of glaring headlights and other bright lights.
- Lutein and zeaxanthin have long been known to help prevent age-related macular degeneration, the leading cause of age-related blindness.
- New studies published in late 2016 now show that lutein and zeaxanthin can significantly improve vision under conditions of glare and bright lighting, potentially extending the ability of older adults to safely continue to operate their vehicles.
- Given the broad spectrum of benefits that these “macular carotenoids” provide, they should become a regular part of any supplement regimen that aims at improving eyesight quality.
In 2011, higher macular pigment optical density was closely associated with faster photostress recovery times and improved glare disability measurements.\(^{17}\)

It has long been established that supplementation with lutein and zeaxanthin can be an important contributor to reducing the risk for age-related macular degeneration.\(^{18-20}\)

Two large randomized controlled trials called AREDS and AREDS2 evaluated the use of carotenoids (beta carotene in AREDS and lutein/zeaxanthin in AREDS2), and found supplementation with lutein and zeaxanthin provide the same benefits as beta carotene, but with lower risk of complications.\(^{21,22}\)

The new 2016 studies now establish that macular carotenoids can improve vision under conditions that apply during night driving, in addition to their known benefits for retinal function.

Macular Pigment Protects Against Glaring Light

These human studies demonstrate that supplementation with lutein and zeaxanthin provides significant benefits in fighting glare and helping our eyes recover from sudden bright light exposures.

Some hints that this might be the case come from earlier studies.

It has long been known that higher levels of zeaxanthin and lutein in the retina are protective against degenerative eye disease.\(^{15}\) In addition, higher levels of these carotenoids in the retina are closely associated with improved visual acuity.\(^{15}\)

Contrast sensitivity, the ability to see distinctions between varying levels of contrast, has also been associated with improved macular pigment optical density, which can be increased with supplementation using lutein, zeaxanthin, and meso-zeaxanthin.\(^{16}\)

In 2011, higher macular pigment optical density was closely associated with faster photostress recovery times and improved glare disability measurements.\(^{17}\)

It has long been established that supplementation with lutein and zeaxanthin can be an important contributor to reducing the risk for age-related macular degeneration.\(^{18-20}\)

Two large randomized controlled trials called AREDS and AREDS2 evaluated the use of carotenoids (beta carotene in AREDS and lutein/zeaxanthin in AREDS2), and found supplementation with lutein and zeaxanthin provide the same benefits as beta carotene, but with lower risk of complications.\(^{21,22}\)

The new 2016 studies now establish that macular carotenoids can improve vision under conditions that apply during night driving, in addition to their known benefits for retinal function.

Macular Pigment Protects Against Glaring Light

These human studies demonstrate that supplementation with lutein and zeaxanthin provides significant benefits in fighting glare and helping our eyes recover from sudden bright light exposures.

Some hints that this might be the case come from earlier studies.

It has long been known that higher levels of zeaxanthin and lutein in the retina are protective against degenerative eye disease.\(^{15}\) In addition, higher levels of these carotenoids in the retina are closely associated with improved visual acuity.\(^{15}\)

Contrast sensitivity, the ability to see distinctions between varying levels of contrast, has also been associated with improved macular pigment optical density, which can be increased with supplementation using lutein, zeaxanthin, and meso-zeaxanthin.\(^{16}\)
Nighttime driving can be intimidating for older drivers, largely because of the painful glare encountered in oncoming headlights and other bright light sources against the otherwise dark background. This can lead many to give up driving.

But new science released just last year now shows that lutein, zeaxanthin, and meso-zeaxanthin can significantly reduce the effects of glare and loss of visual sensitivity that occur when driving at night.

These findings extend previous work demonstrating the importance of these supplements for preventing deteriorating vision from age-related macular degeneration.

The new studies provide valuable insight for anyone who wants to continue to enjoy the freedom, independence, and mobility that come with driving, particularly after dark.

Daily supplementation with lutein, zeaxanthin and meso-zeaxanthin makes sense in the context of preserving eyesight for as long as possible.

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

References


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People supplementing with saffron showed an improvement in vision as measured by them seeing an average of two additional lines on the eye chart commonly used by doctors to test vision.1

This formula provides the optimal dose of saffron along with cyanidin-3-glucoside to support healthy vision.6-8

MacuGuard® Ocular Support
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Each bottle lasts for two months.

References

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MacuGuard Ocular Support with Saffron

LuteinPlus® and Mz® are registered trademarks of NutriProducts Ltd., UK, licensed under U.S. Patent 8,623,428.

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Green Tea Reduces Mortality
Green tea is considered one of the healthiest drinks on the planet.\(^1\)

Besides its ability to improve circulation, it can help stabilize blood sugar and combat underlying causes of cancer.\(^2-6\)

But it’s not just that green tea is healthy—it can reduce your risk of dying!

A decade of meticulous research evaluated hundreds of thousands of people in relationship to their dietary habits. The results showed that the higher the consumption of green tea and its polyphenol constituents, the lower the overall risk of dying from any cause. This longevity benefit is especially pronounced in older populations.\(^1,7\)

Green tea combats many underlying processes that contribute to premature aging and disease.

Here, we’ll evaluate compelling studies showing that green tea reduces all-cause mortality. Then we’ll look at how green tea or its components help reduce the impact of specific health problems that contribute to premature death.
Green Tea Reduces Mortality

For many years, green tea and its compounds have demonstrated compelling benefits in basic science and animal studies. But until about a decade ago, there were conflicting results about those health benefits in people.¹,⁸

Now, a handful of epidemiological cohort studies has made the human health benefits much clearer.

In these types of studies, researchers follow a large group of people over a long period of time, recording both the health outcome of interest (death from all causes) and ingestion of substances (green tea consumption) that might influence the outcomes. Once the data have been collected, they are analyzed in search of statistically significant associations between ingested substance and the outcome.

By early 2017, several large cohort studies and meta-analyses of smaller cohort studies had been completed examining the association between green tea consumption and death from all causes. While the results varied somewhat by design and by the populations being studied, they all had one thing in common: They found significant reductions in all-cause mortality among habitual green tea users, compared with nonusers or low-level consumers.¹,⁷-¹¹

The largest individual studies involved populations of 40,000 to more than 160,000 subjects, and they all showed significant all-cause mortality risk reductions of ¹¹%–¹⁸% in those drinking the largest daily amounts of green tea (five or more cups), compared to non-green tea drinkers.¹,⁷-⁹ Those studies also found that the more tea a person drinks, the greater the risk reduction.

A smaller but still sizable study of 14,001 older adults found a still more impressive overall risk reduction of ⁵⁸% in the highest-consumption group—a figure that rose to ⁶⁸% in women only.¹⁰

Finally, a meta-analysis pooling the results of 18 individual cohort studies found a ²⁰% reduction in all-cause mortality risk among the highest vs. the lowest category of green tea consumption.¹¹ That study also broke down the data to show that for each one-cup increment of green tea consumed daily, the risk of all-cause mortality fell by ⁴%, a figure that supports the overall reductions in the preceding studies.¹¹

Together, these studies vividly illustrate the powerful ability of green tea consumption to mitigate the risk of dying from any cause.

Green Tea Fights Age-Related Diseases

How is green tea consumption capable of producing such drops in the risk of death across the board? The reason is because green tea possesses multi-targeted properties that combat five fundamental processes that underlie degenerative disease: oxidative stress, sugar-induced damage (glycation), inflammation, mitochondrial dysfunction, and disruptions to the intestinal microbiome.¹²-²⁰

As a result, green tea consumption has been found to have a beneficial impact on the chronic conditions responsible for killing the majority of older adults, including cardiovascular and neurodegenerative diseases, diabetes/obesity, and cancer, as well as some less-obvious factors like dental problems. Let’s look at each individually.

Cardiovascular Disease

Cardiovascular disease remains the leading killer of older Americans and is therefore a major contributor to all-cause mortality. Green tea consumption is widely recognized as a means of lowering cardiovascular disease risk.

Each of the studies mentioned earlier that showed significant reductions in all-cause mortality risk also showed significant decreases in the risk of dying from cardiovascular disease. Specifically, those who consumed the largest amounts of green tea reduced their risk of dying from cardiovascular disease by ¹⁴% to as much as ⁷⁶% (and up to ⁸²% for women).¹,⁷-¹¹

These benefits are largely driven by green tea’s high content of catechins (a type of polyphenol), the most abundant of which is epigallocatechin gallate (EGCG).²¹-²³
Higher levels of green tea catechins are associated with lower levels of triglycerides and LDL cholesterol. EGCG has potent protective effects against the oxidation of LDL cholesterol. This is important because oxidized LDL cholesterol is a major risk factor for, and early contributor to, atherosclerosis and plaque formation that blocks arterial blood flow.

In vitro studies demonstrate that green tea’s effects can protect against oxidized LDL-induced endothelial dysfunction (an early finding in atherosclerosis) by modulating the production of two forms of nitric oxide that regulate signaling changes in blood pressure and flow.

Diabetes

Diabesity (the combination of type II diabetes and obesity) is another major contributor to premature death because it sets up older adults for metabolic, cardiac, neurologic, and malignant catastrophes by feeding inflammatory changes throughout the body.

Green tea—and especially the EGCG contained in green tea extracts—powerfully fights many of the causes and consequences of diabesity.

A human study revealed that taking 90 mg/day of EGCG increases the body’s ability to burn fat for energy, which results in increased energy expenditure. These actions not only combat the accumulation of fat, but also help prevent inflammation caused by fat cells. An animal study showed that EGCG can reduce body weight and shrink fat mass, in large part by stimulating the burning of fat for energy.

Other favorable effects of green tea extracts and EGCG include reductions in fat uptake and liver fat storage, reductions in markers of fat-induced chemical stress, reductions in fat-induced insulin production, and reductions in inflammation produced by fat cells. As an added benefit, green tea extract prevents fat absorption by inhibiting the pancreatic enzymes required for its digestion in the intestine.

Neurodegenerative Diseases

Neurodegenerative diseases like Alzheimer’s and Parkinson’s contribute to early death, and they represent a sizable slice of the overall mortality rate.

Green tea extracts and EGCG fight the causes and progression of neurodegenerative diseases in multiple ways. For example, EGCG may prevent Alzheimer’s disease by reducing production of the toxic protein called beta-amyloid, as well as the resulting inflammation, which otherwise destroys brain cells.

What You Need to Know

Green Tea Reduces Mortality

• A recent barrage of studies has confirmed that people who consume green tea are significantly less likely to die from all causes put together.

• The risk of dying may be reduced by as little as 5% and as much as 76%, depending on study design and population, but the results are consistent across multiple studies.

• Green tea and its extracts exert this remarkable anti-mortality effect by reducing the risk of developing fatal chronic diseases, including cardiovascular and neurodegenerative diseases, obesity and diabetes, and cancer, as well as other conditions that predispose us to an early death, like tooth and gum disease.

• Research demonstrates that the green tea components, EGCG and others, exert these widespread effects because of very specific and focused impact on a small handful of biochemical and cellular processes.

• Green tea extracts should be considered an essential part of an overall strategy to extend life and evade disease.
Not only does this increase the survival of brain cells, it also stimulates new brain cell production, especially in the memory-storage hippocampal area of the brain. These actions have resulted in improved behaviors in an animal model of Alzheimer’s.32-34

**Cancer**

Cancer is the second-leading cause of death in the US, which makes reducing cancer risk an important way to reduce all-cause mortality.

Green tea polyphenols have been found to suppress cancer development and its aggressiveness in in vitro studies of many different cancers, including prostate, melanoma, breast, liver, lung, brain, and bladder malignancies.35-41

Epidemiological studies show that people who drink five or more cups of green tea per day have a 38% lower risk of developing liver cancer, compared with nondrinkers.38 In a group of men with prostate cancer, supplementation with green tea extract reduced markers of oxidative stress and increased natural protective mechanisms.39

Studies of breast cancer in relation to green tea consumption are particularly compelling, and deserve specific mention.

Green tea appears to have multiple effects on breast cancers, both before and after malignancies are discovered.

Studies show, for instance, that among women diagnosed with breast cancer, those with higher green tea consumption are less likely to have tumors spread to regional lymph nodes, or to metastasize, compared with women who consume little or none of the beverage.42

And green tea consumption correlates significantly with diminished recurrence rates of early breast cancers: consumption of three or more cups/day reduces recurrence risk by 31%, and among those with the very earliest (stage I) tumors, significant risk reduction of 57% has been observed.43

Even in studies not restricted to early-stage cancers, green tea consumption has shown a dose-related impact.

One large study showed that, compared with non-tea drinkers, those consuming, yearly, 250 or more grams of green tea leaves had risk reductions of 32% to 41% for breast cancer occurrence, figures generally supported in a large meta-analysis study as well.44,45

Lab studies shed additional light on green tea’s role in breast cancer prevention.

In culture experiments, EGCG was shown to inhibit rare but deadly inflammatory stem-like breast cancer cells, which contribute to extremely poor prognoses when found.46

And in living animals, green tea supplementation inhibited metastatic spread, and reduced the ability of metastases to grow in bones of mice with transplanted human breast tumor tissue.37

Finally, EGCG and green tea extracts are showing signs of effectiveness in the most challenging of breast cancer types, those lacking receptors for estrogen, in which relatively safe and simple treatment with estrogen-fighting drugs is not effective.48,49

Green tea extracts and EGCG act by a wide range of mechanisms to achieve these effects, including:

- Inhibiting the out-of-control cell replication cycle typical of cancers.36,50
- Inducing early cell death (apoptosis) in malignant cells,36,50
- Suppressing the formation of new blood vessels to nourish rapidly-growing tumor masses, resulting in their destruction.35,51,52
- Reducing production of the “protein-melting” enzymes tumors use to invade between cells and spread their malignant tissue.41,53,54
- Inhibiting a host of proinflammatory signaling systems, including nuclear factor kappa B, and cyclooxygenase (COX).55
Oral Health

Oral health, tooth decay, and gum disease are rarely thought of as being associated with premature death, but that’s a dangerous misconception. The alarming truth is that people with gum disease can be anywhere from 34%-72% more likely to die of cardiovascular disease and other complications, compared to those in good oral health.56-59

Tooth loss has also been found to increase the risk of dying by up to 36% in older adults, while preventing tooth decay and loss can reduce that risk by 46%.60,61

Green tea extracts have been found to help slow or prevent tooth decay and loss. Research shows that green tea extract can reduce wear and roughness caused by chemical erosion on tooth material.62

Summary

Studies published over the past decade are substantiating that green tea and its compounds can reduce our risk of dying from all causes.

Significant green tea-associated reductions in all-cause mortality have been reported in a long series of studies in multiple populations, with effects as modest as a 5% reduction, up to a 76% reduction in the risk of dying.1-11

These human longevity benefits correlate with the ability of green tea to protect cells throughout our aging bodies against degenerative alterations.

In response to higher intake of green tea and its extracts, studies reveal a reduced risk of developing cancer, diabetes, and vascular, neurodegenerative disorders.

Polyphenol extracts from green tea represent a low-cost addition to an overall strategy to prevent disease and extend life.

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

References

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- Support strong bones⁵
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Non-GMO

Mega Green Tea Extract Lightly Caffeinated
Item #00953 • 100 vegetarian capsules

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References

Note: EGCG is the acronym for epigallocatechin gallate, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

For full product description and to order Mega Green Tea Extract, call 1-800-544-4440 or visit www.LifeExtension.com

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Surprising Dangers of Elevated Uric Acid

Elevated levels of uric acid are associated with gout, an excruciating form of arthritis.

More recent evidence demonstrates powerful correlations between high uric acid levels and some of the most deadly conditions of our time, including metabolic syndrome, diabetes, kidney failure, and cardiovascular disorders.¹⁻⁵

In 2016-2017, a group of studies appeared linking uric acid elevations to bipolar disorder.⁶⁻⁹

Many people don’t realize that it is possible to have high uric acid without having gout. About 21% of Americans have elevated levels of uric acid (hyperuricemia), but only 4% suffer from gout.¹⁰

A 2016 study highlighted a natural plant extract, called Terminalia bellerica, that can effectively lower uric acid blood levels without the side effects associated with prescription drugs.¹¹

Let’s look at how lowering uric acid blood levels is an important step not only in addressing gout, but also in helping prevent life-shortening diseases.¹¹
Terminalia Bellerica Lowers Uric Acid

*Terminalia bellerica* is a tree native to lower elevations in Southeast Asia, whose fruit has been used for centuries in Indian traditional medicine to treat a variety of diseases, particularly diabetes. 

In 2011, a component of the *T. bellerica* fruit rind, *gallic acid*, was shown to promote antidiabetic activity in a study of diabetic rats. In that study, the extract lowered blood sugar levels, and, in a surprising finding, the animals’ pancreases showed regeneration of their insulin-producing islet cells.

Additional beneficial effects noted in that study included reductions in serum total cholesterol, triglycerides, LDL, urea, creatinine (a measure of kidney dysfunction when elevated)—and also uric acid. 

Other studies have shown that *T. bellerica* has protective properties against oxidative stress, which in turn are thought to directly inhibit the action of an enzyme involved in the synthesis of uric acid.

Human Studies

These findings in diabetic rats led a group of Indian researchers to perform a randomized, controlled clinical trial to determine the efficacy and tolerability of a standardized extract of *T. bellerica* at lowering uric acid levels in humans. 

For the study, 110 people with elevated uric acid received one of the following: a placebo, 40 mg daily of the uric-acid lowering drug *febuxostat*, 500 mg of *T. chebula* extract twice daily, or either 250 mg or 500 mg of *T. bellerica* standardized extracts twice daily. After 24 weeks, the uric acid levels in the placebo recipients had risen significantly compared to baseline levels. In contrast, all non-placebo groups showed a reduction in uric acid levels compared to baseline and to placebo subjects.

The most effective dose of *T. bellerica* was at 500 mg twice daily, which reduced uric acid levels by nearly twice as much as the lower dose.

And while the *T. bellerica* treatment was only about 60% as effective as the prescription drug *febuxostat* at reducing uric acid levels, it achieved these results without the side effects associated with this drug, which include liver function abnormalities, rash, nausea, and joint pain.

Because the other common uric acid-lowering drug, *allopurinol*, also carries a wide range of side effects—including a potentially life-threatening hypersensitivity syndrome—*T. bellerica* supplementation offers a leap forward in safely lowering high uric acid levels while reducing risks of the conditions associated with them.

Why is it Important to Lower Uric Acid Levels?

Our bodies naturally produce uric acid when we break down and recycle the molecules that constitute DNA and RNA. An enzyme called *xanthine oxidase* is responsible for conversion of those compounds into uric acid, which is then normally excreted in the urine. But age-related declines in kidney function lead to impaired excretion and gradual buildup of uric acid in the blood, accounting for the elevated serum uric acid levels in up to 25% of adults.

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**Terminalia Bellerica**

Lowers Uric Acid

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Making matters worse, a diet rich in red meats and sugars, especially fructose—in other words, the typical American diet—can sharply increase uric acid production, further exacerbating the problem. In fact, gout has historically been called “the disease of kings” because of its association with rich diets.

While gout was the original disorder associated with high uric acid, more recent evidence reveals that it is associated with conditions that are far worse. Uric acid blood levels above 8.6 mg/dL in men or 7.1 mg/dL in women are classified as hyperuricemia (although some laboratories and research groups use different limits). High uric acid levels have now been found to be significantly associated with:

- Decreasing kidney function
- Chronic low-level inflammation, itself a major risk factor for many chronic disorders
- Metabolic syndrome
- Type II diabetes
- A wide array of cardiovascular risks, including elevated blood pressure, heart arrhythmias, and risk of death from heart attacks and strokes

What You Need to Know

The Dangers of High Uric Acid

- Uric acid, a byproduct of normal cell growth and turnover, builds up in our bloodstreams as we age, and is exacerbated by the modern American diet.
- While initially associated with gout, rising uric acid levels are now associated with many dangerous, lifespan-shortening conditions including cardiovascular and kidney disease, diabetes, and metabolic syndrome.
- While all of these conditions are proving challenging to treat using modern mainstream medicine, most are proving amenable to prevention with natural compounds.
- *Terminalia bellerica* is an Asian tree whose fruit contains valuable bioactive compounds long used in Indian traditional medicine.
- Extracts of *T. bellerica* have now been shown to safely and effectively reduce uric acid in humans.
- Given the anticipated benefits of across-the-board uric acid reduction, these findings make *T. bellerica* extracts an essential part of any disease-preventing strategy.

What You Need to Know
The Table above shows elevations in risks associated with high uric acid levels in blood.

If recent findings are any indication, these conditions may represent only the tip of the uric acid iceberg. For example, in 2016 and 2017, a group of Italian researchers published several papers demonstrating that elevated uric acid levels play a role in bipolar disorder, while a 2015 study related high uric acid with depression in adolescents.

Several drugs can be effective for many cases of major depression. Yet very few drugs are helpful with bipolar disorder, a condition that's possibly even more heartbreaking than depression.

Together, the evidence that uric acid plays a major role in so many human disorders presents an opportunity for intervention with a safe, effective, plant extract, *T. bellerica*.

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<td>Atrial fibrillation (cardiac arrhythmia)</td>
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<td>Heart muscle enlargement</td>
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Summary

Levels of uric acid rise with age, exacerbated by declining kidney function and our meat- and sugar-rich diets.

Formerly associated mostly with painful gout, we now know that uric acid elevations threaten millions more people with elevated risks for kidney disease, diabetes, metabolic syndrome, and a wide range of cardiovascular disorders.

Exciting research has revealed the potent uric acid-lowering effect of extracts from the fruits of the *Terminalia bellerica* tree, a South Asian shade tree long used in traditional medicine.

These findings suggest one more natural way to combat the risks of so many age-related disorders—and they make *T. bellerica* an important weapon in our arsenal against premature aging and death.

Uric acid is included in Life Extension®’s CBC/Chemistry blood test that costs only $35. Page 62 shows the many health markers included in this ultralow-priced blood test that you can order by calling 1-800-208-3444 (24 hours).

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

References


Blood tests can detect underlying health issues before serious illness manifests.

Cutbacks by Medicare and private insurance companies have caused important tests to be omitted from standard panels.

The basic blood panel offered by Life Extension® provides far more tests—including uric acid—than what most conventional labs check for today.

For the low price of $35, Life Extension’s CBC/Chemistry Panel provides:

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<tr>
<th>Lipid Profile:</th>
<th>Kidney Function:</th>
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<tr>
<td>Total cholesterol</td>
<td>Uric acid</td>
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<td>Triglycerides</td>
<td>BUN (blood urea nitrogen)</td>
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<td>HDL cholesterol</td>
<td>Creatinine</td>
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<td>LDL cholesterol (calc.)</td>
<td>BUN/creatinine ratio</td>
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<td>VLDL cholesterol (calc.)</td>
<td>eGFR (estimated glomerular filtration</td>
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<td>Total cholesterol/HDL ratio</td>
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<tr>
<td>Estimated Coronary Heart Disease risk</td>
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<th>Complete Blood Count:</th>
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<td>Hemoglobin</td>
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<td>MCV (mean corpuscular volume)</td>
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<td>MCH (mean corpuscular hemoglobin)</td>
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<td>RDW (red blood cell distribution)</td>
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<td>White blood cell count</td>
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<td>Immune Cell Differentiation Count</td>
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<td>LDH (lactate dehydrogenase)</td>
<td>Potassium</td>
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<td>AST (aspartate aminotransferase)</td>
<td>Chloride</td>
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<td>ALT (alanine transaminase)</td>
<td>Calcium</td>
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<td>Total protein • Albumin • Globulin</td>
<td>Phosphorus</td>
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<tr>
<td>Albumin/globulin ratio • Bilirubin</td>
<td>Iron</td>
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You can place your order by calling 1-800-208-3444 or log on to LifeExtension.com/CBC.

You’ll be sent a list of drawing stations in your area along with a pre-paid requisition. You can walk into the drawing station nearest you at your convenience.

Our price for all these tests is about 50% less expensive than commercial labs, and you get your results back fast. You also have free access to our Wellness Specialists to help review your results.

To order this comprehensive CBC/Chemistry blood panel for only $35, call Life Extension today at 1-800-208-3444 or order online at LifeExtension.com/CBC.

Blood test services are available only in the continental United States and Anchorage, AK.

Not available in Maryland. Restrictions apply for residents of MA, NY, NJ, RI, and PA.
Support Healthy Uric Acid Levels

A tannin-rich extract derived from the edible fruit of the *Terminalia bellerica* tree helps keep uric acid levels within healthy range.

This patent-pending, standardized extract from *Terminalia bellerica* supports healthy expression of two critical enzymes involved in uric acid metabolism:

- **Xanthine oxidase**,  
- **Inducible nitric oxide synthase (iNOS)**

The name of this standardized *Terminalia bellerica* extract is **Ayuric®**. The suggested dose is one capsule twice a day.

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**Uric Acid Control**

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Ayuric® is a registered trademark of Natreon, Inc. with patents pending.

For full product description and to order Uric Acid Control, 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.
EsophaCool™ neutralizes acid in the area of the esophagus where discomfort most often occurs.

With two acid-neutralizers (magnesium and calcium carbonate) along with proprietary GutGard™ licorice extract, EsophaCool™'s novel formula works rapidly to provide relief to the upper digestive tract.

Natural berry/vanilla-flavored EsophaCool™ tablets taste good without added simple sugars (only stevia and xylitol).

The suggested use is two EsophaCool™ tablets two to three times daily as needed.

For full product description and to order EsophaCool™, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: If taken in high doses, magnesium may have a laxative effect. Due to potential interactions, take at least 4 hours apart from prescription medications. If you have an estrogen-dependent cancer, consult a healthcare professional before use. Do not take if pregnant or lactating.

GutGard is a trademark of Natural Remedies PVT. 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.
Few people consistently eat enough **plant** foods to protect against common age-related decline. Commercial multivitamins do **not** provide vital plant components needed for good health. Life Extension Mix™ is superior to other multivitamins—partly because it provides a remarkably broad array of **fruit** and **vegetable** extracts. Rounding out the superiority is a comprehensive list of **vitamins**, **minerals**, **amino acids**, and more.

When **Life Extension Mix™** was introduced in 1983, it provided the most efficient way to obtain higher-potency nutrients. **Life Extension Mix™** has been upgraded over the past **33 years** to reflect many findings in the scientific literature. **Life Extension Mix™** is the most comprehensive, high-potency daily multivitamin.

---

**LIFE EXTENSION MIX™**

**Tablets, Capsules, or Powder…Your Choice!**

The tablet version of Life Extension Mix™ contains 190 mg of niacin and 1 mg of copper. There is an extra-niacin version that provides 336 mg of niacin at no additional charge (02157). Niacin maintains healthy cholesterol, triglyceride, and fibrinogen levels in those within normal ranges. Those with underlying liver disease sometimes cannot tolerate niacin. The suggested dose is 9 tablets per day in divided doses with meals.

The encapsulated version of Life Extension Mix™ used by many customers provides 1 mg of copper. These capsules are also available without copper (02164). The suggested dosage is 14 capsules per day in divided doses with meals.

The powder version of Life Extension Mix™ contains 1 mg of copper. This powder version is also available without copper (02166). The suggested dose is three scoops per day in divided doses with meals.

For full product description and to order your supply of **LIFE EXTENSION MIX™**, call 1-800-544-4440 or visit www.LifeExtension.com


Contains soybeans.

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.
BY WILLIAM FALOON

William Faloon speaking on December 8, 2016, at an age-reversal seminar in Fort Lauderdale, Florida.

AGE REVERSAL RESEARCH UPDATE
In 2015 we made a commitment to fund research that goes beyond mere disease prevention and treatment.

Our inspiration was ignited by findings showing consistent reversals of aging processes in experimental rodent models.¹⁻⁸

Even more compelling is the possibility that degenerative aging may be reversed in humans.

It has become abundantly clear that therapies may exist right now to systemically rejuvenate elderly people.

Researchers we are involved with have filed Investigational New Drug applications with the FDA to launch full-scale clinical trials. The goal is to statistically validate age reversal in study groups of 30-50 people.

Healthy young blood donors are being recruited to provide plasma concentrates that will be infused into elderly people. Based on previous animal studies,³,⁶,⁷ it is expected that old people receiving concentrated young plasma may grow younger.

In August 2016, we announced the formation of Age Reversal Therapeutics, Inc. The company’s mission was to fund human studies and rapidly make effective therapies available to those who have a short time to live.

Age Reversal Therapeutics, Inc. was only allowed to accept funds from “accredited investors,” which required burdensome SEC paperwork. When the offering expired on March 31, 2017, there was less than $1 million invested or committed. This amount was insufficient to fund the clinical studies. So 100% of the funds we received were returned to investors.

We’ve also received tax-deductible donations of about $54,000 that remain in a charity account. These funds will only be used to fund human age-reversal projects.

Each day, over 5,000 Americans perish from age-related illnesses.⁹ Based on what’s been recently discovered, many of these human lives could have been saved.

This article describes our new plan to accelerate human age-reversal research.
We live in an unprecedented era as it relates to our understanding of pathological aging. This knowledge enables us to investigate and measure the effects of interventions that may enable meaningful reversals of degenerative processes.

The prospect of age reversal has not gone unnoticed. Headline news routinely reports on today’s billionaires, who are funding projects aimed at achieving longer and healthier lifespans.10-17

We at Life Extension® applaud those seeking to turn aging into a relic of the past, as was done with smallpox, polio, and other diseases.

The multiple factors involved in aging however, make it unlikely that any person alone will discover the ultimate cure. A more rational approach is to utilize the talents of like-minded activists in a united effort.

Pulling Resources Together

The new strategy initiated in April 2017 is a “private association” that brings together like-minded individuals into a group that seeks to rejuvenate aging people... like you and me.

The group holds regularly scheduled conference calls whereby information is disseminated about participating in age-reversal studies, self-experimentation, investing/donating to specific projects, and raising public awareness.

This private association is analogous to groups formed in the past to advance a science when the medical profession showed little interest.

Below is an excerpt from the March 2014 edition of Life Extension Magazine® that describes the success of such an association:

“In 1767, a few wealthy and civic-minded citizens in Amsterdam gathered to form the Society for Recovery of Drowned Persons.18

Amsterdam is a city of canals and hence people fell in and drowned. It thus became the birthplace for the teaching and promotion of the resuscitation of dead persons.

Within four years of its founding, the society in Amsterdam claimed that 150 persons were saved by their recommendations.19

The Society for Recovery of Drowned Persons introduced scientific techniques, along with ethical changes that started a collective belief that resuscitation of the dead was possible.

Following successes of the Amsterdam society, rescue societies sprang up in most European capitals in the 18th century, all with the goal of finding a way of successfully resuscitating victims of sudden death. Many of these techniques (or variations of them) are used in modern emergency medical practice.”

Our private association will seek to rescue aged humans who may not live long enough for rejuvenation therapies to be fully validated. We might save many lives, as did the civic-minded Amsterdam group 250 years ago.
Here is the game plan:

1. We believe aging is at least partially reversible using existing therapies;

2. There is a growing interest in transforming this into clinical reality;

3. Those interested in age reversal want active (not passive) engagement;

4. The most efficient way to advance age-reversal research is via a private association (analogous to the Amsterdam society).

Choosing a Name

I initially proposed our private group be named Society for Rescue of Senescent Persons. Others in the group suggested something more recognizable, so the name on our website is now:

Society for Rescue of Aged Persons

Please understand that this association is informal, has no bylaws, incorporating documents, or other legal structure. Its sole purpose is to unite people in ways that will accelerate the availability of rejuvenation technologies to benefit all of humanity, including members of the group.

This private association initially consists of activists, investors, and donors involved in our previous age-reversal initiatives. These individuals share a common desire to rejuvenate aged people.

New Age-Reversal Efforts

- Life Extension made a commitment in 2015 to fund age-reversal research.
- Therapies may exist right now to systemically rejuvenate elderly people.
- Researchers we are associated with have filed Investigational New Drug (IND) applications with the FDA to launch full-scale clinical trials with an eye toward statistically validating age reversal in study groups of 30-50 subjects.
- More than 5,000 Americans die each day from age-related illnesses. Based on recent discoveries, many of these lives could have been saved.
- Multiple factors involved in aging make it unlikely that any one person will find the cure.
- Our new strategy is a “private association,” the Society for Rescue of Aged Persons, which will seek to rescue older people who might otherwise not live long enough to benefit from upcoming rejuvenation therapies.
- The Society for Rescue of Aged Persons will exchange scientific information, foster strategic alliances, and support biomedical endeavors aimed at reversing degenerative aging.
- To apply for informal membership in the Society for Rescue of Aged Persons, log on to: www.rescueelderly.org
Readers of this publication should be assured that when any breakthrough occurs, they will be informed about where and how to access the scientifically-validated rejuvenation therapy.

To apply for informal membership in the Society for Rescue of Aged Persons, you can log on to: www.RescueElderly.org

Moving Forward…

We live in an era whereby limitations on maximum lifespans may soon be vanquished.

Multiple biomedical technologies are emerging comparable to the personal computer/communication revolution that arose in 1981.

Our mission is to demonstrate statistically significant human age reversal so that an eruption of charitable and capitalistic forces will compete to induce even longer, healthier lifespans.

Each day our research is delayed, we grow older and more frail. There is tremendous urgency to move human rejuvenation projects forward.

Every time you purchase a blood test, nutrient, or other product advertised in this magazine, you help us contribute more funds toward human age-reversal endeavors.

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

How the Private Association Operates

The Society for Rescue of Aged Persons consists of about 1,000 individuals who have demonstrated their desire to donate, invest, and/or actively participate in advancing human age-reversal studies.

Partnerships may form within or outside the group in any manner the individual members choose to congregate. Information will be shared at the discretion of the individual members.

There are some prestigious individuals in this group who are bound by confidentiality/nondisclosure contracts. We nonetheless welcome their input and any meaningful scientific data they are permitted to disseminate. A key to our success will be open-source information sharing whenever feasible.

To reiterate, the Society for Rescue of Aged Persons has no formal structure. Its purpose is to exchange scientific information, foster strategic alliances, and support biomedical endeavors aimed at reversing degenerative aging.

Who Is Eligible to Join?

Since 2015, we have asked Life Extension supporters for assistance to advance our mission.

We’ve gathered together an impressive group of scientists and activists. At this point, we are limiting this group to those who are willing to actively participate in our noble cause. We are not seeking spectators.
References


Age-Reversal Human Projects

- Young Plasma Transfer/apheresis
- Stem cell-mobilized young plasma infusion
- Thymic Regeneration
- GDF-11 restoration
- Purge senescent cells with senolytics
- Remove cellular debris with rapamycin

These technologies are ready for clinical trials. No new drug development required.
Neuro-Mag® (Magnesium L-Threonate) was specifically formulated by MIT scientists to be uniquely absorbable by brain and nerve cells.

Neuro-Mag®
THE SMART MAGNESIUM
Supports Improvement in Overall Cognitive Ability*

Neuro-Mag® Magnesium L-Threonate
Item #01603 • 90 vegetarian capsules

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Neuro-Mag® Magnesium L-Threonate Powder with Calcium and Vitamin D3
Item #01602 • 225 grams of powder

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For full product description and to order Neuro-Mag® Magnesium L-Threonate or Neuro-Mag® Magnesium L-Threonate Powder with Calcium and Vitamin D3, call 1-800-544-4440 or visit www.LifeExtension.com


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Make your future healthier than your past.

JOIN US FOR THIS HISTORIC EVENT

RAADfest August 9-13, 2017, San Diego, CA

Learn the latest scientific advancements • Gain vital insights to extend your health and well-being • Connect with like-minded people and scientists • Enjoy live music and performances

Confirmed presenters include:

Aubrey de Grey, Ph.D.
Biomedical gerontologist, founder of SENS Foundation, editor of scientific journal Rejuvenation Research

Suzanne Somers
Actress, best-selling author, and integrative wellness advocate

Terry Grossman, M.D.
Anti-aging physician and medical director, Grossman Wellness Center

Michael Rose, Ph.D.
One of the first scientists to postpone aging, Professor at University of California, Irvine

Michael West, Ph.D.
Stem cell and telomere research pioneer, CEO of BioTime, Inc, a company involved in many fields of regenerative medicine

Greg Fahy, Ph.D.
Gerontology author and researcher overseeing human immune (thymic) regeneration research

Dmitry Kaminskiy
Developer of advanced artificial intelligence to accelerate cures for disease and aging, managing partner of Deep Learning Ventures

William Faloon
Spearheading human age reversal research on behalf of Life Extension, the world’s largest consumer based anti-aging medical group

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REGISTER NOW AT WWW.RAADFEST.COM

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PROMOTE BRAIN HEALTH AND RELAXATION

L-Theanine helps control overstimulation of brain cells—promoting relaxation without diminished daytime alertness or other side effects.¹

The L-Theanine in this product:

• Inhibits excitatory stimuli at glutamate receptors in the brain²,³
• Stimulates production of relaxing neurotransmitter GABA⁴
•Beneficially influences gene expression in brain areas related to memory and mood⁴
• Supports blood pressure control under stress for those within normal levels²

Non-GMO

References

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.
Curcumin is a critical part of a healthy longevity program. This extract of turmeric spice promotes a healthy inflammatory response in your joints, supports brain, breast, and colon health, and encourages healthy cell division — but is difficult to absorb. So our Super Bio-Curcumin® formula delivers the patented turmeric extract BCM-95® Bio-Curcumin®, which is up to seven times more absorbable and lasts longer in your bloodstream, too.

Get the maximum health benefits of this incredible nutrient. Make Super Bio-Curcumin® part of your daily health regimen today.

NON-GMO

Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.


For a complete list of ingredients, dosage and use, important cautions and references, go to www.LifeExtension.com.
Magnesium is a mineral involved in over 300 metabolic processes in the body.

Most Americans do not obtain enough magnesium from dietary sources, which may contribute to a variety of chronic diseases.

There is a lack of involvement from the medical community in recommending magnesium. A study published in the Journal of the American Medical Association (JAMA) concluded that:

“...results of this study indicate that a significant number of patients with serum magnesium abnormalities are clinically unrecognized and demonstrate the efficacy of routine serum magnesium measurements.”

A deficit of magnesium can lead to migraines, bone loss, stroke, heart disease, and many other illnesses.

What has excited researchers is the role that magnesium can play to decrease the risk factors for type II diabetes.
The Harm of Intensive Farming Practices

The Green Revolution occurred between the 1940s and 1960s and marked one of the largest increases of food production in history.\textsuperscript{15,16} An American biologist named Norman Borlaug pioneered the farming technologies in this era. He received a Nobel Peace Prize in 1970 for saving over a billion people from starvation.\textsuperscript{17}

While fertilization techniques developed as part of the green revolution have increased the production of food exponentially, one result has been a reduction in the amounts of minerals and vitamins in our food.\textsuperscript{18} The result? More food, less nutrients.

Since the revolution, magnesium levels in grains have declined by an average of 19.6\%. This is a concern in regions where up to 75\% of the daily magnesium intake is from grains.\textsuperscript{18}

Researchers see a correlation between nutrient shortages and the use of commercial fertilizers containing nitrogen, phosphorus, and potassium.\textsuperscript{18} Plants require these elements to live, but some of these ingredients also compete with magnesium for absorption. Research suggests that the use of these types of fertilizers is creating unbalanced nutrition in our commercially available vegetables.

Magnesium is required for plant function. For example, it is essential for the production of chlorophyll, a green pigment responsible for photosynthesis. In some plants, magnesium activates enzymes involved in the production of glutathione,\textsuperscript{18} a free-radical scavenger that has been shown to play a role in multiple cellular events, including gene expression and immune response.\textsuperscript{19}

Wide-Ranging Benefits of Magnesium

All the cells in our body depend on magnesium to function. It is one of the many substances necessary to produce ATP (energy currency of the cell) and is a necessary cofactor for many key enzymes necessary for physical functioning.\textsuperscript{18,20,21} It is for these many reasons that magnesium plays such a key role in keeping all systems of our body functioning optimally.

Researchers often conduct a meta-analysis that combines many studies to reveal common findings. This enables an assessment of the impact that specific research may have on disease. A recent meta-analysis of over one million participants from 40 studies found that magnesium intake reduced the risk of stroke, heart failure, type II diabetes, and all-cause mortality.\textsuperscript{22} The following numbers show impressive reductions per 100 mg/day increments in magnesium intake by patients:

- 7% reduced risk of stroke
- 22% reduced risk of heart failure
- 19% reduced risk of type II diabetes
- 10% reduced risk in all-cause mortality

The benefits of magnesium go even further, and new research has confirmed previous findings of its role on adequate glucose utilization and insulin signaling.

Trials on Magnesium for Glucose Improvement

Some of the most concrete research on magnesium has shown how it manages insulin resistance, a major cause of type II diabetes.\textsuperscript{23} It is important to understand what occurs when the body becomes resistant to insulin.

Blood levels of glucose rise after a meal is consumed. Insulin is necessary to move the glucose from the blood and transport it inside the cells.
MAGNESIUM DEFICIENCY INCREASES INSULIN RESISTANCE

When glucose is consistently elevated it causes excess insulin secretion. Chronically elevated insulin causes insulin receptors on our cells to eventually stop responding to insulin after having too much of it.

Despite the pancreas secreting more and more insulin, the insulin receptors in our cells do not respond. The result is an increase in blood glucose levels that can lead to diabetes and its related diseases.

Scientists have discovered very specific details of magnesium’s relationship to diabetes. Their research has revealed that insulin receptors depend on magnesium to function properly and respond to insulin. In addition, they have discovered that high levels of insulin also cause an increase in the amount of urinary magnesium excreted from the kidneys, thereby reducing the body's levels of this important mineral.24

This research highlights the severity of magnesium deficiency on the increased dangers of insulin resistance. What happens is a vicious cycle that reinforces this diabetic condition, in which lack of magnesium causes insulin resistance and excessive insulin reduces the levels of magnesium in the body.

A 2015 study published in the journal Diabetes Metabolism evaluated the efficacy of a daily dose of 382 mg of magnesium on 116 individuals aged 30 to 65 with prediabetes and low magnesium, taken for a period of four months.25

At the end of the trial, significant changes compared to placebo were seen. The researchers found an 11.6% reduction in fasting glucose, a 8.8% decrease in post-meal glucose, a 30.5% decrease in insulin resistance scores, and a 26.7% decrease in triglycerides. This led authors to conclude that:

“…magnesium supplementation reduces plasma glucose levels, and improves the glycemic status of adults with prediabetes and hypomagnesaemia [low magnesium].”25

What You Need to Know

Magnesium

• Many Americans do not obtain enough magnesium from dietary sources.
• Industrial farming practices contribute to the problem, as they slowly deplete the soil of critical nutrients like magnesium.
• Magnesium deficits are seen in many diseases that affect the aging population.
• Recent findings show the importance of magnesium supplementation in improving glucose levels and insulin sensitivity.

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“…magnesium supplementation reduces plasma glucose levels, and improves the glycemic status of adults with prediabetes and hypomagnesaemia [low magnesium].”25
It is known that insulin resistance is associated with a higher risk of pancreatic cancer. In an estimated 80% of cases, those with pancreatic cancer have diabetes or some form of glucose intolerance when they are diagnosed.26,27

Another statistic reveals that when type II diabetes is first diagnosed there is a four- to seven-fold increased risk of developing pancreatic cancer within three years.28

The relationship between diabetes and pancreatic cancer is not always the first thought in doctors’ minds when someone presents with prediabetes or diabetes. Medical management of diabetes should not just focus on current glucose levels but preventing the occurrence of pancreatic cancer over the long term.

The British Journal of Cancer published a revealing study evaluating magnesium’s role in pancreatic cancer. The researchers followed over 66,000 men and women aged 50 to 76 over a course of eight years. During that time, 151 participants developed pancreatic cancer.29

The results of the study revealed that for every 100 mg drop per day in magnesium consumption, the risk of developing pancreatic cancer increased by 24%.

In addition, the researchers calculated the risks of developing pancreatic cancer for those whose intake of magnesium were suboptimal according to the government’s recommended daily allowance (RDA). If intake of magnesium was suboptimal, which is determined as 75%-99% of the government’s recommended daily allowance (RDA), then the risk of developing pancreatic cancer was 42% higher compared to intake that was equal to or greater than the RDA. For those who had an intake of less than 75% of the government’s RDA there was a 76% higher risk of developing pancreatic cancer compared to intake that is equal to or greater than the optimal intake.

What this tells us is that the medical community should embrace and utilize the latest research into magnesium’s multiple benefits. This would go a long way to reduce the epidemic of diseases resulting from magnesium deficiency.

**Summary**

Research supporting magnesium’s role in reducing diabetic risk and its associated diseases is robust. Many Americans do not obtain enough magnesium from dietary sources.1

Intensive farming practices have led to a soil deficiency of magnesium. The decreased mineral content in the soil makes it challenging to obtain optimal levels from food sources alone.

If current trends continue, 33% of adults in the US will have type II diabetes by the year 2050.30

Magnesium supplementation represents a low-cost method to insure against deficiency of this vital mineral.
If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

References


Optimal heart health depends on many factors including proper functioning of the endothelium—the thin layer of cells lining the interior of the entire circulatory system.

TRIPLE-ACTION PROTECTION

Endothelial Defense™ with Pomegranate Complete and CORDIART™ contains three unique ingredients shown to improve endothelial health.

1. **Pomegranate Complete** provides potent polyphenols clinically shown to support healthy blood flow.

2. **CORDIART™** (extract from sweet orange peels) activates endothelial production of nitric oxide, which supports healthy circulation.

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For full product description and to order Endothelial Defense™ with Pomegranate Complete and CORDIART™, call 1-800-544-4440 or visit www.LifeExtension.com

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Eye Pressure Support with Mirtogenol® formula may support healthy blood flow within the tiny vessels (microvasculature) of your eyes, helping to promote healthy fluid pressure.

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Every year or so, it seems like medicine opens a new front in the battle against heart disease, one that will supposedly turn the tide against the leading cause of mortality among American adults. It might be a new device, new and better pharmaceuticals, more advanced diagnostics, or a new surgical approach.

Yet no matter how much hope greets these new developments, cardiovascular disease continues its deadly rampage through the American population, killing more than 600,000 people every year, according to the Centers for Disease Control and Prevention.

Why?

Cardiologist Joel K. Kahn, MD, FACC, thinks he has the answer.

“We have stalled in the fight against heart disease,” he says. “We aren’t addressing many of the underlying causes of heart disease. The current model is not addressing nutrition, supplements, or lifestyle.”

Instead of waiting for mainstream cardiology to catch up to the available research, Dr. Kahn has forged ahead, building a thriving medical practice and web of supportive programs that he says can help patients reverse heart disease and reduce arterial age.

His book, The Whole Heart Solution, lays out more than 70 heart-healthy steps everyone can take to reduce their risk of cardiac disease. This program was adapted into a 2016 PBS special that aired across the country on Thanksgiving weekend.
“My program is built around the idea that cardiovascular disease progresses silently and can be reversed,” he said. “It’s been very well received.”

Dr. Kahn’s transformation into “America’s Heart Healthy Doc” was no accident—it began a decade ago, when he “got fidgety” in his practice.

“I was doing the same five things over and over,” he says. “I knew there was more.”

Before long, he had subscribed to Life Extension® and launched himself down the road to becoming one of America’s leading integrative cardiologists. Along the way, he became one of the first cardiologists in the country to complete coursework on integrative cardiovascular medicine through the American Academy of Anti-Aging Medicine (A4M).

Today, he is continuing his push to prevent one million heart attacks by spreading the word that blood vessel disease is not an “inevitable” part of aging and that it can be reversed.

A New Paradigm in Thinking About Heart Disease

The current mainstream model for diagnosing and treating heart disease is built around the huge Framingham Heart Study, which was first launched in 1948 as a population health study of 5,209 people in Framingham, Massachusetts. Since then, the study has been expanded to include new populations and generations and used to create a popular “risk calculator” that most mainstream cardiologists use to determine their patients’ risk for suffering a heart attack. This risk score is then used to guide treatment decisions like prescribing statin medications or hypertensives to reduce blood pressure.

Unfortunately, says Dr. Kahn, decades of experience show that this approach is hopelessly outdated.

“Framingham just isn’t adequate anymore,” he insists. “It doesn’t address inflammatory markers, environmental stressors, and all the other factors we know about. We’ve stalled because of the complexity of cardiovascular disease.”

Instead, Dr. Kahn recommends using a more complete model like the one proposed by Life Extension® in 2009, which graphically depicts a heart with 17 daggers aimed at it, each representing a proven risk for heart disease. These include low blood levels of omega-3 fatty acids; elevated C-reactive protein; excess insulin; deficiency in nitric oxide, vitamin K, and vitamin D; hormone imbalance, excess homocysteine; and other advanced measures.

“The multi-dagger graphic of heart disease risk factors really caught my eye because it goes way beyond the Framingham risk factors,” he said. “Although the development of cardiovascular disease is complex, if you’re armed with knowledge, you have a much better chance to identify risk factors and create a prevention program.”

Dr. Kahn has transformed his practice around this concept, with astonishing results. He begins his relationship with new patients by first taking a thorough medical history, then ordering a comprehensive battery of tests to build a database that he uses to estimate arterial and vessel age.

“We use advanced lipid testing, because a routine lipid panel is not enough,” he says. “We check apolipoprotein A and others. We also check thyroid hormone, insulin resistance, ferritin levels, urinary micro albumin, omega-3 fatty acids, oxidized LDL, and various inflammatory markers.”

He also uses the carotid intima-media thickness test as a measure of artery health and relative age.

All of this information is rolled into a comprehensive therapeutic program that almost always
Wellness Profile

which contains a blend of ingredients that are designed to support the mitochondria. “I also recommend this for many patients, especially patients with congestive heart failure,” he says.

Some of his other recommended supplements include:

- For hypertension, which he identifies as “probably the toughest” cardiac condition to treat naturally, Dr. Kahn often recommends olive leaf, magnesium, and L-taurine.

- To combat widespread deficiencies in omega-3 fatty acids “even among people who believe they are eating healthy,” Dr. Kahn frequently recommends supplementing with a high-quality omega-3 fatty acid, depending on the results of blood tests. He regularly monitors his patients’ blood levels of omega-3 fatty acids and adjusts dosages to keep them in the optimal range.

- He recommends vitamin K2 to all of his patients, remarking that, “I’m waiting for the definitive study, but so far I’m impressed.”

- Based on studies showing reversal of atherosclerosis, he often prescribes garlic extract.

- If homocysteine levels are high, Dr. Kahn says patients should take a B-complex vitamin to bring them down.

- A daily multivitamin formulation is important to support general health.

includes nutrition and diet recommendations, exercise, supplements, and, when appropriate, pharmaceuticals.

“We’ll see tremendous improvements in labs and decreases in carotid artery thickness,” he reports. “This is extremely exciting. Arterial age reflects total health, and physicians can be taught to reverse arterial age.”

Dr. Kahn’s Program for Younger Arteries

How is it possible to reverse a disease that’s considered chronic? For Dr. Kahn, it begins with the basics: lifestyle, lifestyle, lifestyle.

Dr. Kahn himself has been a “plant-based human” for decades and recommends that his patients eat a plant-based or Mediterranean diet. He strongly recommends that everyone who comes into his office watches *Forks Over Knives*, a documentary film that says most degenerative diseases can be reversed or prevented by avoiding animal protein and processed food.

He also recommends moderate exercise, which means 30 to 40 minutes of exercise every day. He’s quick to point out this does not mean that everyone needs to train for marathons or sign up for the nearest cross-fit class. Instead, he recommends gentler forms of exercise like tai chi or yoga.

“My credo is extreme in diet, moderate in exercise, and abundant in love,” he said. “Live well, eat well, exercise well, sleep well, and sweat a bit.”

Finally, Dr. Kahn is a strong believer in the power of supplements to help reduce disease risk, improve markers of heart health, and balance out dietary insufficiencies. He has a few particular favorites among *Life Extension’s* products.

“I’m fascinated by the Arterial Protect formula and its potential of diminishing arterial plaque,” he says, mentioning *Life Extension’s* heart-healthy blend of French maritime pine bark extract and gotu kola extract.

Dr. Kahn personally takes Mitochondrial Energy Optimizer, which contains a blend of ingredients that are designed to support the mitochondria. “I also recommend this for many patients, especially patients with congestive heart failure,” he says.

Some of his other recommended supplements include:

- For hypertension, which he identifies as “probably the toughest” cardiac condition to treat naturally, Dr. Kahn often recommends olive leaf, magnesium, and L-taurine.

- To combat widespread deficiencies in omega-3 fatty acids “even among people who believe they are eating healthy,” Dr. Kahn frequently recommends supplementing with a high-quality omega-3 fatty acid, depending on the results of blood tests. He regularly monitors his patients’ blood levels of omega-3 fatty acids and adjusts dosages to keep them in the optimal range.

- He recommends vitamin K2 to all of his patients, remarking that, “I’m waiting for the definitive study, but so far I’m impressed.”

- Based on studies showing reversal of atherosclerosis, he often prescribes garlic extract.

- For vegans and people who generally avoid animal protein, he suggests L-taurine, creatine, and vitamin B daily.

- If homocysteine levels are high, Dr. Kahn says patients should take a B-complex vitamin to bring them down.

- A daily multivitamin formulation is important to support general health.
Wellness Profile

Dr. Joel Kahn’s World

Dr. Joel Kahn’s practice, the Kahn Center for Cardiac Longevity, is located in suburban Detroit, with offices in Bloomfield Hills and Grosse Pointe Farms. If you want to learn more about Dr. Kahn’s practice and organizations, visit any of the following:

Kahn Center for Cardiac Longevity
www.kahnlongevitycenter.com
(248) 731-7412

Dr. Kahn’s personal website offering tips and articles is located at:
https://drjoelkahn.com

The Greenspace Café, his plant-based restaurant, is located at:
215 W. Nine Mile Rd.
Ferndale, MI 48220
(248) 206-7510

The Plant Based Nutrition Support Group can be found online at:
www.pbnsg.org

Forks Over Knives is available online at
www.forksoverknives.com
or on Netflix.

• Lastly, he recommends that patients do everything possible to support healthy nitric oxide levels. Nitric oxide is critical to healthy arterial function. To help boost nitric oxide, Dr. Kahn first recommends lifestyle modifications like getting more exercise and juicing. If this isn’t enough, he suggests supplements like pomegranate extract.

  Dr. Kahn’s outreach to patients doesn’t end with a thriving practice and his expanding media presence. He has made it his mission to support patients in every way possible—even if that means going into new businesses and launching new ventures.

  “I had a patient call and say they were scheduled for a bypass and wanted a support group,” he says. “I couldn’t find one to recommend, so we started one, the Plant Based Nutrition Support Group. It was supposed to be just a few dozen people, but it exploded in popularity and now has over 3,000 members. Social support is so important.”

  He also launched the Greenspace Café in suburban Detroit, which Dr. Kahn called the “largest plant-based restaurant between Fort Lauderdale and Los Angeles.”

  If this all sounds like a lot, Dr. Kahn has a simple word of advice: “If you want extreme results, you take extreme action.”

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Broccoli

One of the most popular of cruciferous vegetables—a family that includes cauliflower, cabbage, bok choy, and Brussels sprouts—broccoli is also one of the most beneficial of foods.

Broccoli was originally cultivated in Italy sometime in the 1600s. Today it is featured in a wide variety of dishes and is cooked a number of ways, although the healthiest methods are to steam this dark green veggie or consume it raw, which preserves its rich assortment of nutrients.

Some of the best reasons to make room for broccoli in your salad bowl or on your plate include:

**Diabetes Control**

Broccoli contains chromium, a mineral that our bodies use to help regulate insulin to maintain blood glucose levels.1

**Phytochemicals**

Broccoli contains a number of phytochemicals, such as indole-3-carbinol, isothiocyanates and glucosinolates, which are known to have anticancer properties.2 Studies suggest that broccoli consumption is associated with a reduced risk of some types of cancer, including lung, colon, and breast cancer.3

**Maintaining Healthy Eyes**

If you’re looking for a food to help support your eyesight, then broccoli is the way to go. It contains the powerful carotenoids lutein and zeaxanthin, as well as beta-carotene and vitamin C, all of which have supportive or protective effects on your eyes, helping to keep cataracts and macular degeneration at bay.4

**Bone Strength**

People who are susceptible to osteoporosis—menopausal women and the elderly, for instance—would do well to make a habit of eating broccoli, since it contains bone-strengthening nutrients such as calcium and vitamin K1.5,6 Some vitamin K1 converts to biologically active K2 in the intestines. To ensure optimal K2 status, taking a supplement containing the MK-4 and MK-7 forms of vitamin K is suggested.

**Sun Exposure**

The compound sulforaphane, which is abundant in broccoli, has been shown to lessen the damaging effects of UV radiation to the skin.7

References

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**Enhanced Berry Complete with Acai** provides in each 700 mg capsule, extracts of 12 berries including blueberries and strawberries.

The suggested supplemental dose for most individuals is one capsule daily.

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**Enhanced Berry Complete with Acai**
Item #01496 • 60 vegetarian capsules

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It’s not easy to get in five servings of vegetables a day—and even if you do, cooking can destroy many of the protective compounds found in broccoli, Brussels sprouts, cauliflower, and celery.

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References

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High Potency Optimized Folate (5,000 mcg)
Item #01913 • 30 vegetarian tablets

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Sodium Bicarbonate as a Therapy for Chronic Kidney Disease
A Review of the Scientific Evidence

“My mother has chronic kidney disease, and I have been reading about a possible treatment using sodium bicarbonate. Her doctor has concerns about this approach but doesn’t give me any details. Can you provide more information, pros and cons, about this treatment?”

Thank you for your question and sorry to hear about your mom. I am assuming that you’re asking because she’s showing signs of progressive kidney dysfunction, such as worsening metabolic acidosis, abnormal urine tests, and symptoms such as muscle weakness.

Unfortunately, this is how chronic kidney disease (CKD) progresses. And I totally understand wanting to try anything to help your mom and slow down the progression of kidney dysfunction.

However, your doctor has good reason to be concerned. Although short-term studies show a benefit from oral bicarbonate therapy, long-term safety data are lacking. But let’s do our own thorough review of the scientific literature and see what conclusions we can draw.
Metabolic Acidosis is the Hallmark of Chronic Kidney Disease

First, some background. The kidneys play an important role in maintaining metabolic homeostasis. Although there are several components to metabolism, the kidneys specifically balance acids and bases, helping your body maintain a slightly alkaline (basic) pH of around 7.4.

The kidneys accomplish this by excreting the daily acid load, derived mostly from the metabolism of amino acids, as phosphoric acid and ammonium.1 The more acids the body produces, the more phosphoric acid and ammonium the kidneys excrete — thus helping to maintain balance.

However, all of this reverses with kidney dysfunction. As less of the daily acid load is excreted, the blood becomes more acidic. Eventually, an imbalanced state develops called metabolic acidosis, which is commonly associated with chronic kidney disease.2

This process is a vicious cycle. Chronic kidney disease results in metabolic acidosis, which in turn causes more kidney damage. Additional problems include low bone mineralization, muscle breakdown, insulin resistance, high triglycerides, systemic inflammation, low blood pressure, and malaise.2,5

Restoring metabolic balance by reversing metabolic acidosis is one of the goals in treating chronic kidney disease, and this is where oral sodium bicarbonate comes into play.

**Benefits of Oral Bicarbonate Therapy**

Sodium bicarbonate naturally buffers retained acids in the body. Some clinicians believe that by increasing bicarbonate levels and enhancing the buffering effect, metabolic acidosis will decrease, along with many of its associated problems.

The first study I came across in support of this theory evaluated the effects of oral bicarbonate and muscle strength in 20 people with chronic kidney disease and mild acidosis. They were treated during successive two-week periods with a placebo followed by increasing oral sodium bicarbonate doses.6

In this short, small study, the results showed a dose-dependent increase in serum bicarbonate (which means better buffering of acids) and improvement in lower extremity muscle strength.6

Interestingly, higher bicarbonate doses were not associated with increased blood pressure or greater edema. This is an important point, as doctors fear oral bicarbonate may raise blood pressure.6

A second study randomly assigned 134 people with chronic kidney disease to either oral sodium bicarbonate or standard-of-care for two years. The researchers followed the subjects’ creatinine clearance (a measure of kidney function that declines with chronic kidney disease) and nutritional parameters, such as dietary protein intake.7

The researchers concluded that oral bicarbonate supplementation slows the rate of decline of creatinine clearance and helps to improve nutritional parameters. Additionally, they were able to show that subjects taking bicarbonate were significantly less likely to experience a rapid decline in kidney function.7

The research literature seems good so far. We’ve reviewed two studies showing improved acid buffering, less muscle weakness, slower rates of decline in creatinine clearance, and improvements in nutritional status with oral bicarbonate supplementation.

The next study I found was a longer, five-year prospective study that recruited 120 people with high blood pressure that resulted in kidney dysfunction.4 They were randomized into three groups: placebo, sodium chloride, and sodium bicarbonate.
The researchers measured the rate of filtration through a specific part of the kidney called the glomerulus. Doctors refer to this measurement as the glomerular filtration rate (GFR), which can progressively decline despite the adequate control of hypertension.8

After five years, the rate of GFR decline was slower and total GFR was higher in patients given sodium bicarbonate than in those given placebo. Additionally, urinary indices of kidney damage also improved in the bicarbonate group.8

This is good news — a larger and longer study of oral bicarbonate therapy showed that it can preserve glomerular filtration rate, a measurement that usually declines despite treating high blood pressure. The authors concluded:

“...our study shows that in hypertensive nephropathy, daily sodium bicarbonate is an effective kidney protective adjunct to blood pressure control...”9

Is Eating Veggies Just as Good?

Let's not jump on the bicarbonate bandwagon just yet.

It turns out that eating fruits and vegetables is most likely a safer option and is beneficial for people with chronic kidney disease as well. This next study may help put some of this into perspective.

The researchers randomly assigned people with stage 4 chronic kidney disease (there are five stages in all) to either oral bicarbonate or a diet rich in fruits and vegetables designed to reduce dietary acid by half. Then they followed them for one year.9 Using a standard measurement of acidity, the researchers found that both treatment arms reduced metabolic acidosis, although bicarbonate therapy produced significantly better results.9

So eating fruits and vegetables is not as good. However, given some of the concerns of bicarbonate therapy, it could be a better option for some people with chronic kidney disease.

Scant Long-Term Data Merit Concern

Please be aware that, although the results of these studies are favorable, there remains a great deal of uncertainty as to the long-term viability of this approach in chronic kidney disease, particularly in older people. Strong, objective evidence to support the effectiveness and safety of sodium bicarbonate in older patients with chronic kidney disease is not available, though some small studies have suggested a benefit.

It really comes down to risk, which can include worsening hypertension due to sodium load, worsening edema, arterial calcification, and maybe even heart failure. For example, there's a possibility that vascular calcification can occur since bicarbonate makes phosphate less soluble. This may promote precipitation of calcium phosphate within arterial blood vessel walls.

Additionally, a 2013 study suggests a 14% increased risk of heart failure with each 1-mEq/L increase in serum bicarbonate level over 24 mEq/L. These are observational data, so the causal relationship is unknown.10

Lastly, optimal dosing for oral sodium bicarbonate has yet to be established. Identifying the effective dose, where the risk-to-benefit ratio is low, is a critical piece of information that's currently missing. Keep in mind that too much bicarbonate can create an imbalance on the opposite end of the spectrum, called metabolic alkalosis.
Compelling evidence from controlled, long-term studies in older patients is desperately needed to understand the impact of bicarbonate supplementation in chronic kidney disease before recommending this treatment to older patients who suffer from the illness.

Many factors play a role in determining a specific dose of sodium bicarbonate. If you wish to discuss using bicarbonate with your physician, dosages used in studies range from 1.5 g/day to 5 g/day.7,11,12

If you embark on a program with oral bicarbonate for chronic kidney disease, close monitoring of your dose and serum bicarbonate level is strongly suggested, preferably under the care of a nephrologist.

Dr. Michael Smith, a graduate of the University of Texas Southwestern Medical School, is senior health scientist and online personality for Life Extension®. Often described as “the country doctor with a city education,” Dr. Smith is an author, blogger, and lecturer who has created and conducted numerous health-related webinars, as well as scripted and hosted a variety of informative online videos.

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

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- **FOOD SAFE ALLERGY TEST – BASIC** (LCM73001) - $198
  This test measures delayed (IgG) food allergies for 95 common foods.

- **FOOD SAFE ALLERGY TEST – EXTENDED** (LCM73002) - $198
  This test measures delayed (IgG) food allergies to an additional 95 foods.

- **FOOD SAFE ALLERGY TEST – COMBO** (LCM73003) - $375
  This test measures delayed (IgG) food allergies to all 190 foods found in our Basic and Extended panels.

NEW GENETIC TESTING

- **DNA GENETIC CANCER RISK PROFILE** (LC100057) - $299
  With only a saliva sample, you can identify your risk for 25 hereditary cancers by analyzing 98 genes from your DNA including the well-known BRCA1, BRCA2, TP53, and APC. Not available in FL, NY, and RI.

- **APOE GENETIC TEST FOR ALZHEIMER’S AND CARDIAC RISK** (LC100059) - $149
  Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglycerides levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing Late Onset Alzheimer’s disease. According to the National Institute of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer’s disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele.

  In the cardiovascular system ApoE is involved in the transportation of fat molecules into your cells. E4 is associated with increased levels of cholesterol and triglycerides, which leads to atherosclerosis, heart disease and stroke.

CBC/CHEMISTRY PROFILE

- **CBC/CHEMISTRY PROFILE** (LC381822) - $35
  Note: This CBC/Cheumistry Profile is included in many Life Extension Panels. The following panels are included in the CBC/Cheumistry Profile:

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

  **LIVER FUNCTION PANEL**
  AST (SGOT) • ALT (SGPT) • LDH • Total Bilirubin • Alkaline phosphatase

  **KIDNEY FUNCTION PANEL**
  BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid

  **BLOOD PROTEIN LEVELS**
  Total Protein • Albumin • Globulin • Albumin/Globulin Ratio

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

  **BLOOD MINERAL PANEL**
  Calcium • Potassium • Sodium • Chloride • Iron
**BLOOD TEST PANELS**

<table>
<thead>
<tr>
<th>Panel Name</th>
<th>LC Code</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MALE LIFE EXTENSION PANEL (LC322582)</strong></td>
<td>CBC/Chemistry Profile • DHEA-S • PSA (prostate-specific antigen) Homocysteine • C-Reactive Protein (high-sensitivity) Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c</td>
<td>$269</td>
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<tr>
<td><em><em>MALE HORMONE ADD-ON PANEL</em> (LCADDM)</em>*</td>
<td>Pregnenolone and Dihydrotestosterone (DHT) To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides information about a testosterone metabolite that can affect the prostate; and the hormone pregnenolone that acts as a precursor to all other steroid hormones.</td>
<td>$120</td>
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<tr>
<td><strong>MALE ELITE PANEL (LC100016)</strong></td>
<td>CBC/Chemistry Profile • Free and Total Testosterone • Total Estrogens Estradiol • DHEA-S • Progesterone • Pregnenolone • HT • FSH • LH • TSH Free T3 • Free T4 • Total T3 • Total T4 • Reverse T3 • Total PSA • IGF-1 • SHBG • HbA1c Vitamin D 25-OH • hs-CRP, ferritin • Homocysteine • Hemoglobin A1c</td>
<td>$575</td>
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<td><strong>MALE COMPREHENSIVE HORMONE PANEL (LC100010)</strong></td>
<td>CBC/Chemistry Profile • DHEA-S • Estradiol • DHT • PSA Pregnenolone • Total and Free Testosterone • SHBG • TSH • Free T3 This panel now includes Free T4 and Cortisol with no increase in price!</td>
<td>$299</td>
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<td><strong>MALE BASIC HORMONE PANEL (LC100012)</strong></td>
<td>DHEA-S • Estradiol • Total and Free Testosterone • PSA</td>
<td>$75</td>
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<td><strong>THYROID ADD-ON PANEL (LCTHYROID)</strong></td>
<td>Free T3 &amp; Free T4.</td>
<td>$55</td>
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<td><strong>OMEGA CHECK™</strong> (LCOMEGA)</td>
<td>Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Check™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.</td>
<td>$131.25</td>
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<tr>
<td><strong>INSULIN (LC004333)</strong></td>
<td>Helpful to assess insulin resistance.</td>
<td>$29.90</td>
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<tr>
<td><em><em>NMR LIPOPROFILE</em> (LC123810)</em>*</td>
<td>The NMR Lipoprofile™ directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.</td>
<td>$99</td>
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<tr>
<td><em><em>ADVANCED OXIDIZED LDL PANEL</em> (LC100035)</em>*</td>
<td>This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.</td>
<td>$285</td>
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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.

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**Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.**
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<tr>
<th><strong>Amino Acids</strong></th>
<th><strong>Blood Pressure &amp; Vascular Support</strong></th>
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<tr>
<td>Arginine/L-Ornithine Capsules</td>
<td>Advanced Olive Leaf Vascular Support with Celery Seed Extract</td>
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<td>Arginine Ornithine Powder</td>
<td>Arterial Protect</td>
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<td>Branched Chain Amino Acids</td>
<td>Blood Pressure Monitor Arm Cuff</td>
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<td>D,L-Phenylalanine Capsules</td>
<td>Dual Action Blood Pressure</td>
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<td>L-Ariginine Caps</td>
<td>Endothelial Defense with Pomegranate Complete and CORDIART™</td>
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<td>L-Carnitine</td>
<td>Endothelial Defense with GilSODin®</td>
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<tr>
<td>L-Glutamine</td>
<td>Natural BP Management</td>
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<tr>
<td>L-Glutamine Powder</td>
<td>NitroVasc with CORDIART™</td>
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<td>L-Lysine</td>
<td>Pomegranate Complete</td>
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<td>L-Taurine Powder</td>
<td>Pomegranate Fruit Extract</td>
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<td>L-Tyrosine Powder</td>
<td>Triple Action Blood Pressure AM/PM</td>
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<td>Super Carnosine</td>
<td>VenoFlow™</td>
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<tr>
<td>Taurine</td>
<td>Bone Health</td>
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</table>

**Bone Health**

- Bone Restore |
- Bone Restore with Vitamin K2 |
- Bone Strength Formula with KoAct® |
- Bone-Up™ |
- Calcium Citrate with Vitamin D |
- Dr. Straus's Intensive Bone Formula |
- Strontium Caps |

**Brain Health**

- Acetyl-L-Carnitine |
- Acetyl-L-Carnitine Arginate |
- Blast™ |
- Brain Shield® Gastrodin |
- CocoaMind™ |
- Cognitex® Basics |
- Cognitex® with Brain Shield® |
- Cognitex® with Pregnenolone & Brain Shield® |
- Cognizin® CDP-Choline Caps |
- DMAE Bitartrate (dimethylaminoethanol) |
- Dopa-Mind™ |
- Ginkgo Biloba Certified Extract™ |
- Huperzine A |
- Lecithin Granules |
- Memory Protect |
- Migra-Eeze™ |
- Neuro-Mag® Magnesium L-Threonate |
- Neuro-Mag® Magnesium L-Threonate with Calcium and Vitamin D3 |
- Optimized Ashwagandha Extract |
- PS (Phosphatidylserine) Caps |
- Vipocetine |

**Cholesterol Management**

- Advanced Lipid Control |
- Cho-Less™ |
- CHOL-Support™ |
- Red Yeast Rice |
- Theaflavins Standardized Extract |
- Vitamin B3 Niacin Capsules |

**Digestion Support**

- Artichoke Leaf Extract |
- Digest RC® |
- Effervescent Vitamin C - Magnesium Crystals |
- Enhanced Super Digestive Enzymes |
- Enhanced Super Digestive Enzymes with Probiotics |
- Esophagual Guardan |
- Extraordinary Enzymes |
- Fiber-Immune Support |
- Gastro-Ease™ |
- Ginger Force® |
- Pancreatin |
- Regmint |
- Tranquil Tract™ |
- TruFiber™ |
- WellBetX PGX plus Mulberry |

**Energy Management**

- Adrenal Energy Formula |
- Asian Energy Boost |
- D-Riboce Powder |
- D-Riboce Tablets |
- Forskolin |
- Mitochondrial Basics with BioPQQ® |
- Mitochondrial Energy Optimizer with BioPQQ® |
- NAD+ Cell Regenerator |
- POQ Caps with BioPQQ® |
- Rhodiola Extract |
- RiboGen™ French Oak Wood Extract |
- Triple Action Thyroid |

**Eye Health**

- Astaxanthin with Phospholipids |
- Brite Eyes III |
- Certified European Bilberry Extract |
- Eye Pressure Support with Mirtogenol® |
- MacuGuard® Ocular Support |
- MacuGuard® Ocular Support with Astaxanthin |
- Tear Support with MaquiBright® |

**Fish Oil & Omegas**

- OMEGA FOUNDATIONS® Mega EPA/DHA |
- OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans |
- OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract |
- OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin |
- OMEGA FOUNDATIONS® Provinal® Purified Omega-7 |
- OMEGA FOUNDATIONS® Vegetarian DHA Organic Golden Flax Seed |

**Food**

- California Estate Extra Virgin Olive Oil |
- Rich Rewards® Breakfast Blend |
- Rich Rewards® Breakfast Blend Natural Mocha Flavor |
- Rich Rewards® Breakfast Blend Natural Vanilla Flavor |
- Rich Rewards® Breakfast Blend Whole Bean Coffee |
- Rich Rewards® Decaf Roast |
- Stevia Sweetener |

**Glucose Management**

- CinSulin® with InSea2® and Cromium® 3+ Mega Benfotiamine |
- Tri Sugar Shield® |

**Heart Health**

- Aspirin (Enteric Coated) |
- BioActive Folate & Vitamin B12 Caps |
- Cardio Peak® with Standardized Hawthorn and Arjuna |
- Homocysteine Resist |
- Optimized Carnitine with GlycoCam® |
- Super Ubiquinol CoQ10 |
- Super Ubiquinol CoQ10 with BioPQQ® |
- Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ |
- Super-Absorbable CoQ10 Ubiquinone with d-Limonene |
- TMG Powder |
- TMG Liquid Capsules |

**Hormone Balance**

- DHEA (Dehydroepiandrosterone) |
- Inner Power |
- Pregnenolone |
- Triple Action Cruciferous Vegetable Extract with Resveratrol |
- Triple Action Cruciferous Vegetable Extract |

**Immune Support**

- AHCC® |
- Enhanced Zinc Lozenges |
- Immune Modulator with TriFend® |
- Immune Protect with PARACTIN® |
- Immune Senescence Protection Formula™ |
- Kinoko® Gold AHCC |
- Kinoko® Platinum AHCC |
- Kyolic® Garlic Formula 102 |
- Kyolic® Reserve |
- Lactoferrin (apolactoferrin) Caps |
- NK Cell Activator™ |
- Optimized Garlic |
- Optimized Quercetin |
- Peony Immune |
- ProBoost Thymic Protein A |
- Reishi Extract Mushroom Complex |
- Standardized Cistanche |
- Ten Mushroom Formula® |
- Zinc Lozenges |

**Inflammation Management**

- 5-LOX Inhibitor with AprèsFlex® |
- Advanced Bio-Curcumin® with Ginger & Turmerones |
- Black Cumin Seed Oil |
- Black Cumin Seed Oil with Bio-Curcumin® |
- Boswellia |
- Cytokine Suppress™ with EGCG |
- Serraflazyme |
- Specially-Coated Bromelain |
- Super Bio-Curcumin® |
- Zylamend® Whole Body |

**Joint Support**

- Arthro-Immune Joint Support |
- Arthromax® Advanced with UC-II® & AprèsFlex® |
- Arthromax® with Theaflavins & AprèsFlex® |
- Arthromax® Herbal Joint Formula |
- Bio-Collagen with Patented UC-II® |
- Fast-Acting Joint Formula |
- Glucosamine/Chondroitin Capsules |
- Kill Healthy Joint Formula |
- MSM (Methylsulfonylmethane) |

**Kidney & Bladder Support**

- Cran-Max® Cranberry Whole Fruit Concentrate |
- Optimized Cran-Max® with Ellirose™ |
- Uric Acid Control |
- Water-Soluble Pumpkin Seed Extract |

**Liver Health & Detoxification**

- Anti-Alcohol with HepatoProtection Complex |
- Calcium D-Glucarate |
- Chlorella |
- Chlorophyllin |
- European Milk Thistle |
- Glutathione, Cysteine & C |
- HepatoPro |
- Liver Efficiency Formula |
- N-Acetyl-L-Cysteine |
- PectaSol-C® |
- Pectin & Camu Camu Extract |
- Pektin & Camu Camu Extract |
- Silymarin |
- SODzyme® with GliSODin® & Wolfberry |

**Longevity & Wellness**

- Ageless Cell™ |
- Alpha-Lipoic Acid |
- AMPK Activator |
- AppleWise Polyphenol Extract |
- Berry Complete |
- Blueberry Extract |
- Blueberry Extract with Pomegranate |
- CR Mimetic Longevity Formula |
DNA Protection Formula
Enhanced Berry Complete with Acai
Essential Daily Nutrients
Grapeseed Extract with Resveratrol & Pterostilbene
Mediterranean Whole Food Blend
Mega Green Tea Extract (decaffeinated)
Mega Green Tea Extract (lightly decaffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Optimized Resveratrol with Nicotinamide Riboside
pTeroPure™
Pycnopogon® French Maritime Pine Bark Extract
Resveratrol with Pterostilbene
RNA (Ribonucleic Acid)
Super R-Lipoic Acid
X-R Shield

Men’s Health
Mega Lycopene Extract
PalmettoGuard® Saw Palmetto with Beta-Sitosterol
PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol
Pomi-T™
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

Minerals
Boron
Extend-Release Magnesium
Ionic Selenium
Iron Protein Plus
Magnesium (Citrate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Vanadyl Sulfate
Zinc Caps

Miscellaneous
Potassium Iodide
Solarshield® Sunglasses

Mood & Stress Management
5-HTP
L-Theanine
Natural Cortisol Balance
Natural Stress Relief
SAMe (S-Adenosyl-Methionine)

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

Personal Care
Anti-Aging Rejuvenating Scalp Serum
BioSil®
Dr. Proctor’s Advanced Hair Formula
Dr. Proctor’s Shampoo
European Leg Solution Featuring Certified Diosmin 95
Face Master Platinum
Facial Toning System

Probiotics
Bifido Oil Balance
FLORASSIST® GI with Phage Technology
FLORASSIST® Heart Health
FLORASSIST® Mood
FLORASSIST® Oral Hygiene
Jarro-Dophilus® for Women
Theralec® Probiotics
TruFlora® Probiotics

Skin Care
Advanced Anti-Glycation Peptide Serum
Advanced Growth Factor Serum
Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Trivalent Tripeptide Serum
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Face Oil
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Glycation Serum with Blueberry & Pomegranate Extracts
Antioxidant Facial Mist
Anti-Redness & Adult Blemish Lotion
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
DNA Repair Cream
Essential Plant Lignans Reparative Serum
Eye Lift Cream
Face Rejuvenating Anti-Oxidant Cream
Fine Line-Less
Healing Formula
Healing Vitamin K Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydromer®
Lifting & Tightening Complex
Melatonin Cream
Mild Facial Cleanser
Multi Stem Cell Skin Tightening Complex
Neck Rejuvenating Anti-Oxidant Cream
Rejuvenex® Body Lotion
Rejuvenex® Factor Firming Serum
Renewing Eye Cream
Resveratrol Anti-Oxidant Serum
Shade Factor™
Shade Factor™ Sunscreen Lotion
Shade Factor™ Sunscreen Spray
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Skin Tone Equalizer
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Triple-Action Vitamin C Cream
Ultimate MicroDermabrasion
Ultra Eyelash Booster
Ultra Lip Plumper
Ultra Rejuvenex®
Ultra RejuveNight®
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Youth Serum

Pet Care
Cat Mix
Dog Mix

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

Sports Performance
Creatine Capsules
Creatine Whey Glutamine Powder (Vanilla Flavor)
New Zealand Whey Protein Concentrate (Natural Chocolate and Vanilla Flavor)
Tart Cherry with CherryPure®
Whey Protein Isolate

Vitamins
Ascorbyl Palmitate
Benfotiamine with Thiamine
Betacarotene
Bioactive Complete B-Complex
Biotin
Buffered Vitamin C Powder
Fast-C® with Dihydroquercetin
Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
Gamma E Mixed Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK7
Natural Vitamin E
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5'-Phosphate Caps
Super Absorbable Tocotrienols
Super K with Advanced K2 Complex
Vitamin B12
Vitamin B6
Vitamin C with Dihydroquercetin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

Weight Management
7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress CalReduce Selective Fat Binder
DHEA Complete
Garicina HCA
HCA Active™ Garcinia Cambogia Extract
Integra-Lean®
Mediterranean Trim with Sinetrol™-XPur
Optimized Ivylin with Phase 3 Calorie Control Complex
Optimized Saffron with Satireal®
Super Citrimax®
Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women’s Health
Advanced Natural Sex for Women® 50+
Breast Health Formula
Femmenessence MacaPause®
Natural Estrogen
Progester Care®
Super-Absorbable Soy Isoflavones
Ultra Soy Extract

"PRODUCTS"
<table>
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<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>Retail Each</th>
<th>1 Unit Each</th>
<th>4 Unit Each</th>
<th>10 Unit Each</th>
<th>QTY</th>
<th>Total</th>
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<tr>
<td>A</td>
<td>ACETYL-L-CARNITINE • 500 mg, 100 veg. caps</td>
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<td>ACETYL-L-CARNITINE ARGINATE • 90 veg. caps</td>
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<td>01219</td>
<td>AGELESS CELL™ • 30 softgels</td>
<td>40.00</td>
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<td>00681</td>
<td>AHCC® • 500 mg, 30 caps</td>
<td>59.98</td>
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<td>24404</td>
<td>AHCC® (KINOKO® PLATINUM) • 750 mg, 60 veg. caps</td>
<td>84.95</td>
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<td>AHCC® (KINOKO® GOLD) • 500 mg, 60 veg. caps</td>
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<td>ALPHA-LIPOIC ACID W/BIOTIN • 250 mg, 60 caps</td>
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<tr>
<td>01907</td>
<td>AMPK ACTIVATOR • 90 veg. caps</td>
<td>48.00</td>
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<tr>
<td>01509</td>
<td>ANTI-ADIPOCYTE FORMULA W/MERATRIM® &amp; INTEGRA LEAN® (Advanced) • 60 veg. caps</td>
<td>39.00</td>
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<td>01625</td>
<td>APPIES POLYPHENOL EXTRACT • 600 mg, 30 veg. caps</td>
<td>21.00</td>
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<td>01039</td>
<td>ARGinine-ORThINE • 500/250, 100 caps</td>
<td>17.99</td>
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<td>00308</td>
<td>ARGinine-ORThINE POWDER • 150 grams</td>
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<td>01624</td>
<td>(L)-ARGININE CAPS • 700 mg, 200 veg. caps</td>
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<td>ARTERIAL PROTECT • 30 caps</td>
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<td>ARTHROMAX® W/THAFLAVINS &amp; APRÉSFLLEX® 120 veg. caps</td>
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<td>ARTHROMAX® Advanced W/UC-II® &amp; APRÉSFLLEX® 60 caps</td>
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<td>ARTHROMAX® HERBAL JOINT FORMULA • 60 veg. caps</td>
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<td>ARTICHOKE LEAF EXTRACT • 500 mg, 180 veg. caps</td>
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<td>ASCORBYL PALMITATE • 500 mg, 100 veg. caps</td>
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<td>ASHWAGANDHA EXTRACT (Optimized) • 60 veg. caps</td>
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<td>01066</td>
<td>ASPIRIN® • 81 mg, 300 enteric coated tablets</td>
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<td>BENEFOTIAMINE W/ THIAMINE • 100 mg, 120 veg. caps</td>
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<td>01496</td>
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<td>BETA-CAROTENE • 25,000 IU, 100 softgels</td>
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<td>BILBERRY EXTRACT • 100 mg, 90 veg. caps</td>
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<td>BIO-COLLAGEN W/PATENTED UC-II® • 40 mg, 60 small caps</td>
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<td>*0006</td>
<td>BIOSIL™ • 5 mg, 30 veg. caps</td>
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<td>*0007</td>
<td>BIOSIL™ • 1 fl oz</td>
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<td>00702</td>
<td>BION® • 600 mcg, 100 caps</td>
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<td>01709</td>
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**SUBTOTAL OF COLUMN 1**

**SUBTOTAL OF COLUMN 2**

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
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<tr>
<td>01421</td>
<td>COGNITEX® BASICS • 60 softgels</td>
<td>38.00</td>
<td>Unit $</td>
<td>0107</td>
<td>FINE LINE-LESS • 1 oz</td>
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<td>01659</td>
<td>COGNIZIN® CDP CHOLINE CAPS • 250 mg, 60 veg. caps</td>
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<td>01945</td>
<td>COMPLETE 8-COMPLEX (Bioflavin) • 60 veg. caps</td>
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<td>COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs</td>
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<td>67.50</td>
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<td>01949</td>
<td>COQ10 w/ LIMONENE (Super-Absorbable) • 50 mg, 60 softgels</td>
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<td>18.75</td>
<td>16.50</td>
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<td>01929</td>
<td>COQ10 (Super Ubiquinol) • 100 mg, 60 softgels</td>
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<td>42.00</td>
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<td>33.00</td>
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<td>COQ10 w/BIOPOQ® (Super Ubiquinol) • 100 mg, 30 softgels</td>
<td>54.00</td>
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<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 60 softgels</td>
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<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 60 softgels</td>
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<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 30 softgels</td>
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<td>CRAN-MAX® • 500 mg, 60 veg. caps</td>
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<td>CRAN-MAX® WITH ELLIROSETM (Optimized) • 60 veg. caps</td>
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<td>CREATINE CAPSULES • 120 veg. caps</td>
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<td>01746</td>
<td>CREATINE WHEY GLUTAMINE POWDER • 454 grams (vanilla)</td>
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<td>01429</td>
<td>CR MICROMETIC LONGEVITY FORMULA • 60 veg. caps</td>
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<td>CURCUMIN® (Super Bio) • 400 mg, 60 veg. caps</td>
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<td>CURCUMIN® W/GINGER &amp; TURMERONES (Advanced Bio) 30 softgels</td>
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<td>01804</td>
<td>CYTOKINE SUPPRESS® W/ESCg • 30 veg. caps</td>
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**cosmetics**

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<th>ITEM No.</th>
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<td>ADVANCED ANTI-GLYCATION PEPTIDE SERUM • 1 oz</td>
<td>53.00</td>
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<td>ADVANCED GROWTH FACTOR SERUM • 30 ml</td>
<td>65.00</td>
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<td>ADVANCED LIGHTENING CREAM • 1 oz</td>
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<td>ADVANCED PEPTIDE HAND THERAPY • 4 oz</td>
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<td>ADVANCED TRIPLE PEPTIDE SERUM • 1 oz</td>
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<td>ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 oz</td>
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<td>80139</td>
<td>AMBER SELF MICRODERMABRASION • 2 oz</td>
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<td>80156</td>
<td>ANTI-AGING FACE OIL • 1 oz</td>
<td>59.00</td>
<td>44.25</td>
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<td>ANTI-AGING MASK • 2 oz</td>
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<td>ANTI-AGING REJUVENATING FACE CREAM • 2 oz</td>
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<td>ANTI-AGING REJUVENATING SCALP SERUM • 2 oz</td>
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<td>80134</td>
<td>ANTI-GLYCATION SERUM W/BLUEBERRY &amp; POMEGRANATE EXTRACTS • 1 oz</td>
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<td>80133</td>
<td>ANTIOXIDANT FACIAL MIST • 2 oz</td>
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<td>80105</td>
<td>ANTI-REDNESS &amp; ADULT BLEMISH LOTION • 1 oz</td>
<td>74.50</td>
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<td>BROCCOLI SPROUT CREAM • 1 oz</td>
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<td>COLLAGEN BOOSTING PEPTIDE SERUM • 1 oz</td>
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<td>80141</td>
<td>DNA REPAIR CREAM • 1 oz</td>
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<td>ESSENTIAL PLANT LIPIDS REPARATIVE SERUM • 1 oz</td>
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<td>EYE LIFT CREAM • 0.5 fl oz</td>
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<td>FACE REJUVENATING ANTIOXIDANT CREAM • 2 oz</td>
<td>69.50</td>
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**subtotal of column 3**

**subtotal of column 4**

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**receive 25% off the retail price of all products**

**July 2017**
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<td>DOPA-MIND™ + 60 veg. tabs</td>
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<td>00321</td>
<td>DR. PROCTOR’S ADVANCED HAIR FORMULA + 2 oz</td>
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<td>00320</td>
<td>DR. PROCTOR’S HAIR SHAMPOO + 8 oz</td>
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<tr>
<td>01997</td>
<td>ENDOTHELIAL DEFENSE™ with POMEGRANATE COMPLETE AND CARDIO™ + 60 softgels</td>
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<td>00997</td>
<td>ENDOTHELIAL DEFENSE™ with GLISODIN® + 60 veg. caps</td>
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<td>01937</td>
<td>EPA/DHA (Mega) + 120 softgels</td>
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<td>02009</td>
<td>ESOPHAGOL® + 120 chewable tablets</td>
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<td>01737</td>
<td>ESOPHAGAL GUARDIAN (Berry flavor) + 60 chewable tablets</td>
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<tr>
<td>01042</td>
<td>EUROPEAN LEG SOLUTION DIOGIMIN 95 600 mg, 30 veg. tabs</td>
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<tr>
<td>01706</td>
<td>EXTRAORDINARY ENZYMES + 60 caps</td>
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<td>02008</td>
<td>FLORASSIST® THROAT HEALTH (California Estate) EXTRA VIRGIN OLIVE OIL + 590 ml (16.9 fl. oz)</td>
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<td>FLORASSIST® GI with PHAGE TECHNOLOGY • 30 veg caps</td>
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<td>01054</td>
<td>FACE MASTER® PLATINUM • Facial Toning System</td>
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<td>00965</td>
<td>FAST-ACTING JOINT FORMULA + 30 caps</td>
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<td>01717</td>
<td>FAST-C® with HYDROQUERCETIN + 120 veg. tabs</td>
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<td>FEMMENESSENCE MACAPUSS™ + 120 veg. caps</td>
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<td>02007</td>
<td>FIBER-IMMUNE SUPPORT (Apple Cinnamon) + 235 grams</td>
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<td>FLORASSIST® GI with PHAGE TECHNOLOGY + 30 liquid veg. caps</td>
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<td>FLORASSIST® HEART HEALTH + 60 veg. caps</td>
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<td>FLORASSIST® ORAL HYGIENE + 30 lozenges</td>
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<td>FLORASSIST® BALANCE + 30 liquid veg. caps</td>
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<td>FLORASSIST® MOOD + 60 caps</td>
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<td>FLORASSIST® THROAT HEALTH + 30 lozenges</td>
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<td>FOLATE HIGH POTENCY (Optimized) + 5,000 mcg, 30 veg. tablets</td>
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<td>FOLATE (Optimized) + 1,000 mcg, 100 veg. tablets</td>
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<td>FOLATE + VITAMIN B12 (BioActive) + 90 veg. caps</td>
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<td>FORSKOLIN® + 10 mg, 60 veg. caps</td>
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<td>FUCOIDAN W/MARITECH® 926 (optimized) + 60 veg. caps</td>
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<td>GAMMA E MIXED TCOTOPHEROL/TOCOTRIENOLS + 60 softgels</td>
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<td>GAMMA E MIXED TCOTOPHEROL with ENHANCED SESAME LIGNANS + 60 softgels</td>
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<td>GARLIC (Optimized) + 200 veg. caps</td>
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<td>02100</td>
<td>GASTRO-EASE℠ + 60 veg. caps</td>
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<td>GINGER FORCE℠ + 60 liquid caps</td>
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<td>GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps</td>
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<td>GLA WITH SESAME LIGNANS (Mega) + 60 softgels</td>
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<td>00345</td>
<td>(L-)GLUTAMINE CAPSULES + 500 mg, 100 veg. caps</td>
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<td>(L-)GLUTAMINE POWDER + 100 grams</td>
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<td>GLUCOSAMINE/CHONDROITIN CAPSULES + 100 caps</td>
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<td>GLUTATHIONE, CYSTEINE &amp; C + 100 veg. caps</td>
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<td>GLYCINE + 1,000 mg, 100 veg. caps</td>
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<td>GRAPE SEED EXTRACT W/RESVERATROL &amp; PTEROSTILBENE 100 mg, 60 veg. caps</td>
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<td>HOMOCYSTEINE RESIST + 60 veg. caps</td>
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<td>HUPERZINE A + 200 mcg, 60 veg. caps</td>
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<td>IMMUNE PROTECT W/PARACIN® + 30 veg. caps</td>
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<td>IMMUNE SENESENCE PROTECTION FORMULA® + 60 veg. tabs</td>
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<td>INNERPOWER℠ + 530 grams powder</td>
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<td>LYCOPÈNE (Mega) + 15 mg, 90 softgels</td>
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RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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**SUBTOTAL OF COLUMN 7**

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**SUBTOTAL OF COLUMN 8**

**JULY 2017**

TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: www.LifeExtension.com
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<td>01448</td>
<td>REJUVENEX® BODY LOTION • 6 oz</td>
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<td>REJUVENEX® FACTOR FIRMING SERUM • 1.7 oz</td>
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<td>01220</td>
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<tr>
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<td>REJUVENIGHT® (Ultra) • 2 oz</td>
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<td>RESVERATROL W/NICOTINAMIDE RIBOSIDE (Optimized) • 30 veg. caps</td>
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<td>RESVERATROL (Optimized) • 60 veg. caps</td>
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<td>00972</td>
<td>(D) RIBOSE POWDER • 150 grams</td>
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<td>SAFFRON W/SATIEREAL® (Optimized) • 60 veg. caps</td>
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**SUBTOTAL OF COLUMN 9**

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<td>SOODZYME® w/GLIDODIN® &amp; WOLFFBERRY • 90 veg. caps</td>
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<td>00657</td>
<td>SOLARSHIELD® SUNGLASSES • Smoke color</td>
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**SUBTOTAL OF COLUMN 10**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
**01051**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**YOUR PRICE**

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<th>Retail Each</th>
<th>1 Unit Each</th>
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<td>VITAMIN B6 • 250 mg, 100 veg. caps</td>
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<td>VITAMIN B12 • 500 mcg, 100 lozenges</td>
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<td>VITAMINS D AND K W/SEA-IODINE™ • 60 caps</td>
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<td>VITAMIN E (Natural) • 400 IU, 90 softgels</td>
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**W**

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**X, Y**

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<td>XYLIWHITE™ MOUTHWASH • 16 oz</td>
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* *1025* ZYFLAMEND® WHOLE BODY • 120 liquid veg. caps | 72.95 | 54.71 |

**BOOKS**

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<td>33890</td>
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<td>THE TRUTH ABOUT MEN AND SEX by Abraham Morgenthaler, MD, FACS • 2015</td>
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<td>MISSING MICROBES • by Martin J. Blaser, MD • 2014</td>
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<td>33867</td>
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**SUBTOTAL OF COLUMN 11**

**SUBTOTAL OF COLUMN 12**

* These products are not 25% off retail price.
** Due to license restrictions, this product is not for sale to customers outside of the USA.
*** Due to license restrictions, this product is not for sale to Canada.
† Due to license restrictions, this product is not for sale to customers outside of the USA and Canada.
† † These products are not 25% off retail price. Due to license restrictions this product is not for sale to customers outside of the USA.

Not sure exactly which supplements you need?

Talk to a Wellness Specialist toll-free at 1-800-226-2370
**ORDER SUBTOTALS**

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<td>SUBTOTAL COLUMN 11</td>
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<tr>
<td>SUBTOTAL COLUMN 12</td>
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**ORDER TOTALS**

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<th>SUBTOTAL OF COLUMNS 1 - 12</th>
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<tr>
<td>POSTAGE &amp; HANDLING (Any size order, in the U.S. includes Alaska &amp; Hawaii)</td>
<td>$5.50</td>
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<tr>
<td>C.O.D.s (ADD $7 FOR C.O.D. ORDERS)</td>
<td></td>
</tr>
<tr>
<td>UPS OVERNIGHT add $10, UPS 2nd DAY AIR add $7. For Puerto Rico, US Virgin Islands, add $7. CANADA UPS EXPRESS Flat rate $17.50, UK Flat rate $25. USD. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.</td>
<td></td>
</tr>
<tr>
<td>SHIPPING</td>
<td></td>
</tr>
<tr>
<td>GRAND TOTAL (MUST BE IN U.S. DOLLARS)</td>
<td></td>
</tr>
</tbody>
</table>

**PLEASE MAIL TO:** Life Extension
P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198
Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050

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**BILL TO ADDRESS**

<table>
<thead>
<tr>
<th>NAME</th>
<th>E-MAIL</th>
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<tbody>
<tr>
<td>ADDRESS</td>
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<tr>
<td>CITY/STATE/ZIP-POSTAL CODE</td>
<td>COUNTRY</td>
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<tr>
<td>PHONE</td>
<td>FAX</td>
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<tr>
<td>VISA/MASTERCARD/AMEX/DISCOVER #</td>
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<tr>
<td>EXP. DATE</td>
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**SHIP TO ADDRESS**

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