Winterize Your Immune System

Heartburn Relief Without Drugs

Hidden Factor Behind Kidney Failure Epidemic

Protect Eyesight From Computer Screen Emission

How Proton Pump Inhibitor Drugs Destroy Brain Cells
Life Extension’s annual SUPER SALE enables clients to obtain all premium-grade nutrient formulas at the year’s lowest prices.

Long-term supporters know that the quality of the products are backed by Life Extension’s commitment to extended healthy lifespans. Below are a few examples of the savings you can enjoy during the SUPER SALE:

<table>
<thead>
<tr>
<th>Formula</th>
<th>Retail Price</th>
<th>SUPER SALE Discount Price</th>
<th>Per Bottle</th>
<th>Percentage Off</th>
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<tr>
<td><strong>Two-Per-Day</strong></td>
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<tr>
<td>120 tablets • Item #02115 (two-month supply)</td>
<td>$20</td>
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<td>Compared to commercial multivitamins, Two-Per-Day has up to 50 times the potency of specific nutrients, as well as unique botanical ingredients. (Also available in capsule form at a slightly higher price.)</td>
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<tr>
<td><strong>Optimized Resveratrol with Nicotinamide Riboside</strong></td>
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<tr>
<td>30 vegetarian capsules • Item #02031</td>
<td>$42</td>
<td>$24.30</td>
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<td>42% off</td>
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<td>“Turn on” your longevity genes with 250 mg of trans-resveratrol, the flavonoid quercetin (150 mg), the NAD+ booster nicotinamide riboside plus botanical extracts extracts like pterostilbene.</td>
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<td><strong>Bone Restore</strong></td>
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<td>120 capsules • Item #01726</td>
<td>$22</td>
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<td>Highly absorbable calcium, boron, magnesium, zinc, and vitamin D3.</td>
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<td><strong>Super Omega-3 EPA/DHA</strong></td>
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<td>120 softgels • Item #01982</td>
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<td>Highly purified Alaskan fish-oil blend plus sesame lignans and olive extract provide essential omega-3 fatty acids and components of a Mediterranean diet.</td>
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<td><strong>AMPK Activator</strong></td>
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<td>$48</td>
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<td>Research shows that the two plant extracts contained in this formula promote AMPK activation, which “turns off” many destructive factors of aging.</td>
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<td><strong>Skin Restoring Phytoceramides</strong></td>
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<tr>
<td>30 vegetarian capsules • Item #01596</td>
<td>$25</td>
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<td>Moisturize your skin from within.</td>
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<td><strong>Ultra Natural Prostate</strong></td>
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<td>60 softgels • Item #01928</td>
<td>$38</td>
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<td>Comprehensive support for an aging prostate gland utilizing extracts from pygeum, nettle, beta-sitosterol, flower pollen, and saw palmetto plus boron and lycopene.</td>
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28 PROTECT AGAINST WINTER COLDS AND FLU
Flu and pneumonia kill 55,000 people a year. Especially vulnerable are those with weakened immune systems such as the elderly. Bolstering immune defenses during winter months is essential for those at risk for infectious illnesses.

50 HEARTBURN DRUGS INCREASE DEMENTIA RISK
Recent studies have shown that the popular acid-reducing drugs known as proton pump inhibitors increase the risk of dementia. Most alarming is the finding that proton pump inhibitors prevent the removal of beta-amyloid plaques that are involved in the pathology of Alzheimer’s. Fortunately, there are newly discovered natural alternatives to these harmful drugs.

62 PROTECT EYESIGHT FROM BLINDING BLUE LIGHT
As the use of smart phones and computers skyrockets, scientists are warning about the dangers of blue light these devices emit. Chronic blue light exposure can lead to blindness. Studies show that nutrients lutein, zeaxanthin, and meso-zeaxanthin that protect against solar ultraviolet rays can also guard your retina against electronic screen-emitting blue light.

74 COMBAT HIGH URIC ACID
More than 20% of Americans have excess uric acid levels, increasing their risk of painful gout, as well as coronary artery disease and early death. A tree fruit extract has been studied for its ability to safely inhibit uric acid production without the use of side effect-prone medications.

DEPARTMENTS

7 AS WE SEE IT: HIDDEN FACTOR BEHIND KIDNEY DISEASE EPIDEMIC
In a new study from Johns Hopkins University, people who use proton pump inhibitor drugs are at increased risk of kidney disease. Further studies show these heartburn drugs can increase risk of bone fractures and heart disease. Natural approaches to relieve heartburn are discussed.

21 IN THE NEWS
Nicotinamide riboside boosts NAD+ and longevity enzymes; melatonin reduces blood pressure; magnesium lowers glucose; and DHEA cuts diabetes risk.

87 RESEARCH UPDATE: BERRIES LOWER DISEASE RISK
Three new studies document the value of anthocyanins in preventing neurodegeneration, heart disease, and diabetes.

94 SUPER FOODS: SAGE
Sage, a common herb in the Mediterranean diet, is known for a wide range of benefits, from lowering blood sugar levels to inhibiting cognitive impairment.

95 AUTHOR INTERVIEW: REAL FOOD/FAKE FOOD
In his book, Real Food/Fake Food, Larry Olmsted exposes the shocking facts behind a variety of fraudulent foods claiming to be authentic. These include olive oil, Kobe beef and specialty cheeses. Much of the blame is due to incompetent FDA oversight, which fails to protect us from these fake foods.
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### Advanced Bio-Curcumin® with Ginger & Turmerones
- Item #01924 • 30 softgels

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In a new report authored by researchers at Johns Hopkins University, people who use proton pump inhibiting drugs to treat heartburn (acid reflux) are at a 20% to 50% increased risk for developing chronic kidney disease.1

The prevalence of kidney disease is increasing in persons 60 years and older. This has led researchers to investigate what new factor is behind this mounting kidney failure problem.

To put this in perspective, a study period ending in 1994 found chronic kidney disease present in 18.8% of older individuals. A study period ending in 2008 found chronic kidney disease in this same age group (60+ years) had surged to 26%. That's a 38% increase over a time-frame of only 14 years.2

More than 1 in 10 American adults now have some stage of chronic kidney disease.1 Many are unaware of their kidneys failing and the increased risk for heart disease that this carries.3

Those afflicted with chronic kidney disease have higher homocysteine4,5 and C-reactive protein6,7 levels, along with reduced production of nitric oxide.8,9 So it is not surprising that kidney impairment elevates vascular disease risk.10

So why is kidney disease skyrocketing in persons over age 60?

Hypertension has long been a prime factor, but greater steps to control blood pressure have been taken in more recent years.

Diabetes is a culprit and poor glycemic control has been on the rise, as are increases in average body (fat) mass.

Overlooked is the impact that drugs have on the kidneys. Common pain relievers such as ibuprofen are notoriously damaging to kidneys, yet few warnings about their nephrotoxic effects are provided to consumers.11,12

The new report found risk of kidney damage is dose dependent. People who took two daily doses of drugs like Prilosec® or Prevacid® had a higher risk compared to one daily-dose users.

One aspect of the study analysis suggests twice-daily proton pump inhibitor dosing was associated with a 46% higher risk of chronic kidney disease than once-daily dosing, which was associated with a 15% higher risk.1

Fundamental changes to reverse this upward trend of kidney disease are urgently needed.

This article will make some suggestions about protecting renal function as we age, and what those who suffer gastroesophageal reflux (GERD) should change in light of the disturbing findings about proton pump inhibitors.
Heartburn (acid reflux) has plagued mankind throughout recorded history. Some of our founding fathers suffered horrific bouts of heartburn for which there was no effective treatment.13

In 1992, I woke up to a sharp stabbing pain in my chest. A quick visit to a gastroenterologist resulted in a diagnosis of esophagitis (caused by reflux). A proton pump inhibitor drug (Prilosec®) was prescribed and my pain disappeared in a few days.

What did people do before proton pump inhibitors were discovered? I wondered? Unlike older medications (such as Tagamet®) that only reduce stomach acid, proton pump inhibitors block it altogether (if used every 12 hours).

Considering that up to 30% of Americans have symptomatic heartburn that occurs at least once weekly, and more than 40% of Americans have it to one degree or another,14 the advent of proton pump inhibitors would have been a miraculous solution—if it were not for the side effects that occur when stomach acid is chronically blocked.

Increased Fracture Risk in Users of Proton Pump Inhibitors

Proton pump inhibiting drugs block stomach acid production, which often provides rapid relief from heartburn symptoms. Yet hydrochloric acid secreted by our stomach is needed to break down foods to facilitate absorption of essential nutrients.

As people age, the gradual decline in stomach acid production makes it difficult to absorb minerals. Chronic use of proton pump inhibitor drugs can severely impair absorption of calcium, magnesium, iron and certain vitamins.15-19

Studies show that regular users of proton pump inhibitors have a 10% to 40% increased risk of bone fractures.15,22-27

In addition, users of these heartburn-relieving drugs suffer higher incidences of pneumonia and bacterial infection (Clostridium difficile).28,29

Vitamin B12 Deficits

Stomach acid is part of the digestive juices needed to absorb vitamin B12. You need acid to separate vitamin B12 from food.

When stomach acid is blocked for an extended period, vitamin B12 deficiencies occur30-32 and can manifest as neurological impairment (sometimes leading to dementia),33 anemia,34 elevated homocysteine,35 and other disorders.

One study found that vitamin B12 deficiency was 65% more common in long-term users of proton pump inhibitors.32 The degree of the B12 deficit correlated with the dose of the proton pump inhibiting drug, i.e. the higher the daily dose, the greater the B12 deficit.

Discontinuation of the proton pump inhibitor resulted in a reversal of the vitamin B12 deficit.32

Those who need to take daily proton pump inhibitors can obtain sufficient B12 levels by taking 1,000 mcg injections of B12 three times a week, or by taking daily sublingual B12 lozenges.
Heart Attacks in Proton Pump Inhibitor Users

Stomach acid is required for optimal absorption of nutrients like selenium and magnesium. Aging individuals who don’t supplement with essential nutrients are often deficient. If they take a proton pump inhibitor and don’t supplement, they are at risk for severe nutrient deficiencies.

When the body is deprived of calcium, it robs it from the bones, which results in release of bony constituents that contribute to coronary artery calcification.36,37

The mineral deficit most frequently associated with proton pump inhibitor use is magnesium. Several studies show frank magnesium deficits in response to suppressing stomach acid with proton pump inhibitors.17,18,38

So it should come as no surprise that people who regularly use proton pump inhibitors suffer heart attack rates higher than nonusers.39-41 A recent study found a 1.58-fold greater risk of heart attack amongst proton pump inhibitor users.39

Users of acid-blocking drugs not only suffer magnesium deficiency, but a lack of vitamin B12 causes their homocysteine levels to surge. These twin vascular risk factors help explain the higher risk of heart attack and stroke in long-term proton pump inhibitor users.

Kidney Damage

Scientists grew suspicious of proton pump inhibitors because they can cause acute interstitial nephritis,32,44 a condition in which spaces between the kidney tubules become swollen and interfere with filtration of toxins out of one’s blood.45

A large case-control study published in 2013 revealed that patients presenting with acute kidney failure were more than twice as likely to be using a proton pump inhibitor drug.46 Typically, acute kidney-failure patients recover rapidly after they withdraw from proton pump inhibiting drugs, but it may take up to three months and in some cases require additional therapy.47

Based on data showing proton pump inhibitors create acute kidney problems, researchers at Johns Hopkins University sought to evaluate the impact on a large group of people over a 6-year period.

A total of 10,482 subjects with a mean age of 63 years were selected from a study titled Atherosclerosis Risk in Communities. The study used several forms of analysis to rule out confounding factors that might have caused chronic kidney disease. The findings from this study published in 2016 revealed that regular proton pump inhibitor use was associated with:

- 35% increased incidence of chronic kidney disease (time-varying analysis)
- 45% increased incidence of chronic kidney disease (unadjusted analysis)
- 50% increased incidence of chronic kidney disease (adjusted analysis that took into account demographic, socioeconomic and clinical variables)
Proton pump inhibitor users were more likely obese and taking antihypertensive medications, which might have increased chronic kidney disease incidences beyond that associated with acid-blocker drugs like Nexium®, Prilosec®, and Prevacid®.

Interestingly, GERD patients who used older drugs like Tagamet® did not show an increase in chronic kidney disease incidence.

A large study published in 2016 confirmed these findings. The study’s authors compared users of proton pump inhibitors (Nexium®, Prevacid®, et al.) to older line drugs like Tagamet® (cimetidine). Patients who took the proton pump inhibitors had a 96% increased risk of developing kidney failure and a 28% increased risk of chronic kidney disease.48

Although we know that hypertension, heart disease, diabetes, and family history are risk factors for kidney disease,49 these findings suggest that proton pump inhibitors are also associated with chronic kidney disease and kidney failure afflicting older individuals.

What GERD Sufferers Should Do

GERD can be a frustrating, vexing problem. It is not caused by excess stomach acid.

The underlying reason for GERD is failure of the sphincter valve between the stomach and esophagus to properly close. This enables stomach contents that include enzymes, food, drink, bile, and acids to reflux back up into the delicate esophageal lining. The outward symptomatic effect is heartburn. The long-term impact can be an increased risk for Barrett’s esophagus, a type of change in the epithelium (lining) of the esophagus which may increase the risk for a type of esophageal cancer.50-52 Though the increase in risk of Barrett’s esophagus is not known with certainty, most medical experts suggest the long-term risk is around 15%–20%, which necessitates an upper endoscopy to assess the esophagus lining every three to five years in chronic GERD sufferers.53-55

Lifestyle modifications that can mitigate or eliminate GERD include weight loss, reducing or eliminating caffeine/alcohol/nicotine, reducing meal size, not eating late in the evening, and elevating the head end of one’s bed so that gravity holds down stomach contents that otherwise enter the esophagus while one sleeps.56-61

While these GERD-mitigating steps work reasonably well, few people implement them consistently.

The convenience of taking a proton pump inhibitor to prevent heartburn has resulted in large swaths of the aging population taking this drug every day, but doing nothing to correct the underlying problem causing GERD.

Quote from Study Published by American Medical Association

“Chronic kidney disease (CKD) affects approximately 13.6% of adults in the United States, is associated with a substantially increased risk of death and cardiovascular events, and accounts for a disproportionately large burden on the financial resources of Medicare. The increasing prevalence of CKD among communities cannot be fully explained by trends in known risk factors, such as diabetes mellitus and hypertension, suggesting that other variables may contribute to the disease process. Medication use may be a potential factor, particularly given tendencies toward polypharmacy. Identifying iatrogenic risk factors for CKD may help to promote the rational use of medications and reduce the burden of CKD worldwide.”

tablet of Prilosec® (omeprazole) once or twice a day to stop heartburn symptoms from manifesting.

With data mounting about the side effects of long-term use of proton pump inhibitors, those with mild to moderate GERD should consider lifestyle changes and a new approach described in this issue of Life Extension.

Severe GERD sufferers should strike a balance between a less frequent dose of the proton pump inhibitor, once symptoms are resolved, and “on demand” therapy if appropriate.

Lifestyle modifications and occasional use of raft-forming alginates should be considered to give the body a break from chronic proton pump inhibitor use.

Sublingual and/or vitamin B12 injections are recommended for those who continue daily use of proton pump inhibitors (hopefully no more than once a day).

New Chewable Antacid Tablets

The article on page 40 of this issue describes a novel antacid utilizing magnesium, calcium, and licorice extract. This unique formula is designed to neutralize acid in the esophagus and promote movement of stomach contents away from the delicate esophageal lining.

This antacid lozenge can help GERD sufferers reduce or eliminate reliance on proton pump inhibitor drugs.
As We See It

Importance of Blood Tests to Evaluate Kidney Health

No one should wait for kidney disease to manifest where it may progress toward end-stage renal failure. This is especially important for users of proton pump inhibitors (and pain relieving drugs).

A comprehensive CBC/chemistry blood test evaluates markers of kidney function such as creatinine and blood urea nitrogen.

The safe upper limit for serum creatinine is 1.00 (mg/dL). Any fractional number over this (such as 1.1) raises concern that can signal the need for the most accurate blood test to evaluate kidney function, called cystatin-C.

Cystatin-C is an underutilized blood marker, which is regrettable because it provides a far more accurate indicator of kidney function than the standard kidney tests.77 Optimal levels of cystatin-C are less than 0.91 mg/L. Any result that comes back higher indicates the presence of kidney disease.

If caught in time, cystatin-C levels can be brought back to normal by discontinuing suspected drugs, such as ibuprofen and/or a proton pump inhibitor.

The only factor that impedes routine use of the cystatin-C blood test is its high cost. Commercial labs charge around $200 for it. Life Extension offers the cystatin-C blood test to consumers for $99.

A comprehensive CBC/chemistry blood test that includes dozens of important markers such as glucose, lipids, and blood counts, along with markers of liver and kidney function, can be obtained directly from Life Extension for only $35.

Cystatin-C provides an earlier indicator of kidney impairment than tests like creatinine that are included in the CBC/chemistry panel.

In light of the new findings, long-term users of proton pump inhibitors should consider ordering the cystatin-C blood test as this provides the earliest warning to cut back or discontinue use of proton pump inhibitor drugs. The CBC/chemistry and/or cystatin-C blood tests can be ordered by calling 1-800-208-3444 or at LifeExtension.com/CBCPlus

Try Reducing Frequency and Dose – “On Demand” Therapy

A number of published papers conclude that Americans are overusing proton pump inhibitor drugs.78-80

The medical literature reveals a dose-response relationship regarding the side effects these drugs induce.1

As reported in the introduction to this article, a recent study has observed increased risks of chronic kidney disease in users of proton pump inhibitors, and the risk may be higher in those who take two doses a day instead of one. Most proton pump inhibitors start to wear off after 12 hours, so by taking only one of these drugs a day, there is at least some restoration of stomach acid production to help better absorb vital nutrients.
Studies dating back 25 years, however, demonstrate that proton pump inhibitors themselves can induce acute interstitial nephritis, which is a condition in which spaces between the kidney tubules become swollen and interfere with filtration of toxins out of one’s blood.41-83

These data should prompt you to consider reducing the dose frequency of your proton pump inhibitor medication to three times per week. Studies that have examined the possibility of intermittent therapy in patients with GERD, however, have been inconsistent as it relates to heartburn relief.

All things considered, an attempt to restrict intake of proton pump inhibitors to "on-demand" dosing, along with the regular use of a novel antacid lozenge described in this issue, may be an effective alternative solution to chronic use of acid-suppressing drugs.

Don’t Be a Victim of Medical Ignorance

Proton pump inhibitor drugs provide almost immediate relief from heartburn symptoms and can facilitate a cure for esophagitis.

In 2013, more than 15 million Americans were prescribed proton pump inhibitors and many more bought this class of drug over the counter.1,84 Study findings suggest that chronic prescribing of these drugs is not medically indicated in many cases.85 One study found that 27% of long term proton pump inhibitor users could discontinue therapy without encountering symptoms.86

Published studies show consistent associations between use of these acid-blocking drugs and higher risk of chronic kidney disease.42,43,46,48 This disorder has increased in prevalence during a time period that corresponds with widespread use of proton pump inhibitors.1,48

Many GERD sufferers have come to rely on proton pump inhibitors to offset the heartburn-inducing effects of eating large meals, excessive ethanol consumption and carrying too much weight.

Common-sense lifestyle changes can enable those with GERD to reduce or eliminate reliance on proton pump inhibitors.

A preponderance of clinical data indicates that this will beneficially result in a reduction in risks of bone fracture, heart attack, stroke, infections, dementia, and kidney failure.

Blood tests can readily reveal if kidney damage is occurring and provide an early warning to discontinue certain drugs before permanent kidney damage manifests.

Please turn this page to see how easy it is to obtain low-cost blood tests that can help you maintain optimal health throughout the New Year.

For longer life,

William Faloon
Blood Testing

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 than what most conventional labs check for today.

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

Kidney Function:
- Creatinine
- BUN/creatinine ratio
- eGFR (estimated glomerular filtration rate)
- Uric acid
- BUN (blood urea nitrogen)

Lipid Profile:
- Total cholesterol
- Triglycerides
- HDL cholesterol
- LDL cholesterol (calc.)
- VLDL cholesterol (calc.)
- Total cholesterol/HDL ratio
- Estimated Coronary Heart Disease risk

Blood Sugar:
- Fasting glucose

Electrolytes and Minerals:
- Sodium
- Potassium
- Chloride
- Calcium
- Phosphorus
- Iron

Liver Function:
- Alkaline phosphatase
- LDH (lactate dehydrogenase)
- AST (aspartate aminotransferase)
- ALT (alanine transaminase)
  - Total protein
  - Albumin
  - Globulin
  - Albumin/globulin ratio
  - Bilirubin

Complete Blood Count:
- Red blood cell count
- Hemoglobin
- Hematocrit
- MCV (mean corpuscular volume)
- MCH (mean corpuscular hemoglobin)
- MCHC (mean corpuscular hemoglobin concentration)
- RDW (red blood cell distribution)
- White blood cell count
- Immune Cell Differentiation Count
- Platelet count

Most Accurate Kidney Test:
Cystatin-C
An early blood marker called cystatin-C is a far more accurate indicator of kidney function than the standard kidney tests. Don’t wait until it’s too late—order cystatin-C today for only $99.

You can place your order by calling 1-800-208-3444 or log on to LifeExtension.com/CBCPlus.
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 and/or Cystatin-C, call Life Extension today at 1-800-208-3444 or order online at LifeExtension.com/CBCPlus.

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.
As We See It


Find the Formula That’s Right for You!
A simple, cost-effective blood test can help you identify your individual vitamin D needs. Life Extension®’s huge selection of vitamin D supplements allows you to customize your dosage.

To order Vitamin D3 supplements, call 1-800-544-4440 or visit www.LifeExtension.com

VITAMIN D3
For Heart Health, Strong Bones, Skin Health, and a Vital Immune System

Vitamin D3 • 1,000 IU
Item #01751 • 250 softgels
Ideal for smaller individuals who also obtain 2,000-3,000 IUs in a multi-formula

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Vitamin D3 • 5,000 IU
Item #01713 • 60 softgels
Ideal for most people who take a multi-formula that contains 2,000-3,000 IUs of vitamin D

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Vitamin D3 • 5,000 IU With Sea Iodine™*
Item #01758 • 60 capsules
With 1,000 mcg iodine, this is ideal for those who may be iodine-deficient due to a salt-restricted diet

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Vitamin D3 • 7,000 IU
Item #01718 • 60 softgels
For individuals who need higher levels, including those who weigh over 180 pounds

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Vitamin D3 • 2,000 IU (Natural Mint Flavor)
Item #01732 • 1 ounce
Great for traveling or for those who have trouble swallowing a softgel or capsule (Also available without mint. Item #00864)

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

*If you have a thyroid condition or are taking anti-thyroid medications, do not use without consulting your health care practitioner.

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Stay Healthy, Live Better
Human studies demonstrate robust neurological benefits in response to low-dose lithium and colostrum-derived proline-rich polypeptides. Memory Protect has been formulated with these two nutrients to support healthy structure of brain cells, normal memory, and recall function.

Each box is designed to enable you to take these nutrients on the identical dosage schedule used in successful clinical trials.

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To order Memory Protect, call 1-800-544-4440 or visit www.LifeExtension.com

Non-GMO. Contains milk.

CAUTION: Consult your healthcare provider before use if you are taking medication. Do not use if pregnant, lactating, or trying to become pregnant. Rare, mild and temporary anxiety and/or sleep disturbance may be experienced.
IT’S SO PURE... IT’LL TOUCH YOUR HEART

Highly Purified Fish Oil From Wild-Caught Alaska Pollock For A Strong Healthy Heart.

Item #01982 • 120 softgels

Retail Price | SUPER SALE PRICE
1-bottle $32.00 | $21.60
4-bottle — | $18.90 ea

NON-GMO

Call 1-800-544-4440 toll-free • www.LifeExtension.com

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These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.
Nicotinamide Riboside Boosts NAD+ Metabolism in Humans

Found in every cell in the body, NAD+ is an enzyme that plays a critical role in maintaining youthful energy metabolism. 

*Nature Communications* reported the results of the first clinical trial of nicotinamide riboside, a form of vitamin B3 known to boost NAD+ cell levels.* Researchers determined that the compound was more effective than niacin and nicotinamide at increasing beneficial nicotinamide adenine dinucleotide (NAD+) and sirtuin enzymes associated with longevity.

In 2004, Charles Brenner, PhD, discovered that nicotinamide riboside occurs in milk and that it can convert to NAD+ in humans. After conducting experiments in rodents, he tested it on himself by consuming a gram daily for a week, accompanied by blood testing that revealed a 2.7 fold increase in NAD+.

Acting on findings in mice, 12 human subjects were given 100 mg, 300 mg, or 1,000 mg nicotinamide riboside in different sequences with a week between each dose. The trial revealed the superiority of nicotinamide ribosome in boosting NAD+ and the activity of sirtuin enzymes.

Editor's Note: The health-enhancing potential of nicotinamide riboside has not gone unnoticed by mass marketers. Aggressive advertising in 2016 touted the ability of nicotinamide riboside to reverse certain aspects of aging. Commercial companies began selling nicotinamide riboside (under a variety of trade names) at high prices. Consumers don’t need to pay these high prices if they look for formulas whose active ingredients include nicotinamide riboside as sold by reputable firms.

Melatonin Helps Lower Blood Pressure, Study Shows

A study from Thomas Jefferson University has found that melatonin supplements may help lower blood pressure in both younger people and older nonhypertensive individuals.*

While previous research had shown the pineal hormone melatonin to have a beneficial effect on both clinical and experimental hypertension in older subjects, this study was focused on the effect of melatonin on both younger and older people whose blood pressure is in the normal or prehypertensive range.

The pilot study of 23 subjects looked at blood pressure readings taken in the clinic as well as readings taken from ambulatory monitoring devices in order to obtain systolic and diastolic numbers over a 24-hour period. The devices took readings every 20 minutes during subjects’ waking hours, and every hour overnight. All the subjects in the melatonin group had both clinical and ambulatory readings taken before and after receiving 9 mg of controlled-release melatonin daily for six weeks. Patients in the control group did not receive melatonin, but had the same blood pressure measurements done before and after six weeks. The results showed that, on average, the office systolic reading of the entire melatonin group of subjects was a statistically significant 7.3 mmHg lower compared to baseline; control subjects dropped 4.4 mmHg compared to baseline (nonsignificant). In the older group, it was, on average, 13.3 mmHg lower (significant), versus 3.3 mmHg in controls (nonsignificant).

Editor’s Note: The melatonin used for this study was donated through the Life Extension Foundation® Buyers Club.

* Presented at AHA Hypertension Scientific Sessions, Sept. 14-17, 2016, Orlando, FL.
Association Between Magnesium and Lower Glucose in Diabetics

A systematic review and meta-analysis appearing in the *European Journal of Clinical Nutrition* affirmed a reduction in plasma glucose in association with magnesium supplementation among those at risk of or diagnosed with diabetes.*

The researchers selected 12 randomized, controlled trials involving 670 diabetics who were followed for a median of 12 weeks and six trials that enrolled 453 men and women at high risk of diabetes followed for a median of 14 weeks.

Among the studies that involved diabetics, there was an association observed between reduced fasting plasma glucose and treatment with magnesium in comparison with a placebo. In studies that involved those at high risk of the disease, magnesium supplementation was associated with significantly improved plasma glucose levels compared to a placebo following a two-hour oral glucose tolerance test and a trend toward reduced insulin resistance.

Editor’s Note: Magnesium supplements given in the trials included magnesium oxide, magnesium picolinate, magnesium aspartate HCl, magnesium citrate, magnesium lactate, magnesium lactate-citrate, magnesium hydroxide, magnesium chloride and magnesium sulfate.

Higher DHEA Levels Associated with Lower Diabetes Risk

An article in *Diabetologia* reports an association between higher levels of **DHEA** and a lower risk of type II diabetes.*

The investigation involved participants in the Rotterdam Study, which enrolled 7,983 men and women from 1990–1993 (Rotterdam Study I) and 3,011 participants in 2000 (Rotterdam study II).

Follow-up visits were conducted every three to five years. The final study was limited to 5,189 subjects who were free of diabetes at enrollment. Over a median follow-up of 10.9 years, 643 cases of type II diabetes were diagnosed. Among those whose serum DHEA levels were among the top third of participants, there was a 27% lower risk of diabetes in comparison with those whose levels were among the lowest third.

**Editor’s Note:** As possible protective mechanisms for DHEA, the authors note that the hormone is a peroxisome proliferator-activated receptor (PPAR) alpha agonist, as are fibrate drugs currently used to treat high triglyceride levels. The fibrate drug bezafibrate was found in one study to reduce the incidence and delay the onset of type II diabetes in subjects with impaired fasting glucose. DHEA has also been shown to be an insulin sensitizer and to help protect against advanced glycation end-product formation. Additionally, DHEA is associated with better endothelial function which, when impaired, has been associated with insulin resistance.

NAD+ (nicotinamide adenine dinucleotide) is found in every cell in the body and plays an essential role in regulating genes that control aging.

The suggested daily dose of one NAD+ Cell Regenerator™ vegetarian capsule provides 100 mg of NIAGEN® Nicotinamide Riboside.

To order NAD+ Cell Regenerator™, call 1-800-544-4440 or visit www.LifeExtension.com

NIAGEN® is a registered trademark of ChromaDex, Inc. Patents see: www.ChromaDexPatents.com.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
The new Extend-Release Magnesium provides an immediate release of magnesium citrate to the stomach and a slow 6-hour release of magnesium oxide for optimal intestinal absorption.

According to data from the National Health and Nutrition Examination Survey of 2005-2006, most Americans fail to consume the estimated average requirement of magnesium from food alone.*

Each capsule of the new Extend-Release Magnesium supplies 250 mg of elemental magnesium designed for sustainable absorption into your bloodstream over a 6-hour period.

Those taking a multinutrient supplement that provides at least 100 mg of elemental magnesium may need only one Extend-Release Magnesium capsule daily.

Reference

Non-GMO
ZumXR® is a registered trademark and protected by patents.

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

To order Extend-Release Magnesium, 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.
Compare **TWO-PER-DAY** to the Leading Brand **CENTRUM**

The **Two-Per-Day** multinutrient formula is superior to commercial multivitamins because it provides vastly higher potencies of vitamins, minerals and plant extracts.

**TWO-PER-DAY** provides:

- 50 times more vitamin B1
- 25 times more vitamin B6
- 12 times more vitamin B12
- 10 times more biotin
- 10 times more selenium
- 8 times more vitamin C
- 2 times more vitamin D
- 2 times as much vitamin E
- 2 times as much vitamin B3
- 3 times as much zinc

**Centrum Can’t Compete**

**Two-Per-Day Capsules**
Item #02114 • 120 capsules • Non-GMO

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**Two-Per-Day Tablets**
Item #02115 • 120 capsules • Non-GMO

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This year’s **Super Sale** ends on **January 31, 2017**.
To order **call 1-800-544-4440** or visit **Life Extension.com**

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These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
The wintertime virus season makes us all vulnerable to infections.

For some older adults, these infections are life threatening because of immune decline (immune senescence) that occurs with age.

Flu and pneumonia are responsible for 55,000 deaths every year in the US. In the presence of immune senescence, flu vaccines may not be sufficient to fight off viral infections.

In this article, we provide a two-pronged strategy to help remain healthy all winter.

The good news is most readers of this publication already follow many of the steps needed to enhance their protective immune function.
Bricks in the Fortress Walls

Natural compounds can help build immune-defenses and protect against wintertime risks such as influenza. While anyone can benefit, it is especially critical for elderly and immune-compromised individuals, since infections can include potentially serious—and even fatal—complications.

Cistanche

*Cistanche* is a type of desert plant whose individual components have been shown to help create more balanced, youthful immune function.

In youth, individuals enjoy abundant naïve T cell populations, which are cells that recognize new threats to the body. These naïve T cells stand ready to destroy new bacteria, viruses, and cancers. Once a naïve T cell performs its job, it then converts to a specialized memory T cell (a cell that can remember a previous threat) that responds only to the same bacteria, virus, etc.

Aging results in an accumulation of senescent T cells that emit inflammatory signals, while depriving the body of vital naïve T cells to fight new invaders and malignancies. This results in a weakening of protective immune function.

*Cistanche* plant extract stimulates development of naïve T cells and leads to a lower number of memory T cells, which creates a more balanced and healthier immune response. *Cistanche* also increases natural killer (NK)-cell activity (cells that seek and destroy cells infected with viruses or transformed by cancer)—an action that has been shown in animal research to result in lifespan increase.5

A human study found that individuals taking standardized *Cistanche* had impressive improvements in their immune profiles after 12 weeks. This included an 11.7% increase in natural killer cell activity and a 20.2% increase in the ratio of CD4 to CD8 cells, which is an indicator of healthier, more youthful immune function.6

Reishi Mushroom

Bioactive components of the *Reishi* mushroom have been shown to exert biological effects that may help reverse many of the factors of immune senescence. Reishi extracts boost the function of innate immune cells, the immune system’s first line of defense.7,8

It has long been established that Reishi’s unique components (including polysaccharides, triterpenes, and others) enhance crucial immune factors in the body, including hematopoietic (bone marrow derived) stem cells and T cells.9-11

Animal research shows Reishi supports multiple aspects of immune function and longevity.12

But it’s in the realm of viral disease that Reishi mushrooms truly flex their muscles.13 In laboratory cell cultures, Reishi mushrooms stop or slow growth of influenza along with other viruses.13-15

Pu-erh Tea Extract

Studies have shown that the extract of *Pu-erh* tea—rich in polyphenols and other bioactive molecules, including a unique group of compounds known as *theabrownins*—may support healthy bone marrow function, which helps rebuild the peripheral immune cellular components.16,17 An animal study demonstrated that Pu-erh tea extract supports immune balance by decreasing the proinflammatory interleukin-6 (IL-6) by a remarkable 43%, while increasing natural killer (NK) cells by 7% and naïve T cells by 10%.16 This results in a positive rebalancing of the immune system, making it more resilient to fight off any type of invader.

Doses of 210 mg/day of *Cistanche tubulosa* extract, 1,130 mg/day of Reishi mushroom and 650 mg/day of Pu-erh tea extract, when combined, support healthier immune function.

*Cistanche* stimulates development of vital naïve T cells.
**Vitamin C**

The activity of many immune cells is closely related to their vitamin C content. This is especially true of the specific cells (phagocytes) that engulf and destroy infecting organisms, and of other cells (T-lymphocytes) that recruit, organize, and direct other immune cells. Studies show that immune function can be improved by supplementing with vitamin C. Vitamin C deficiency has been associated with frequency and duration of colds, along with immune system defects.

For optimal immune defense, many experts recommend supplementing with 1 gram (1,000 mg) of vitamin C daily in addition to consuming a diet rich in fruits and vegetables. Keep in mind that vitamin C at doses between 5,000 mg and 20,000 mg daily (in divided doses to bowel tolerance) can be used when symptoms first appear.

**Vitamin D**

Vitamin D wards off the flu by ramping up the body’s innate immune system. This is the branch that responds immediately to dangerous microbes by releasing antimicrobial peptides. Vitamin D activates the genes that govern antimicrobial peptide production. Vitamin D also suppresses inflammatory cytokines, which are particularly dangerous in certain flu cases.

Compelling evidence supports vitamin D supplementation at much higher levels than are currently recommended by the medical establishment—especially during the winter months when sun exposure is generally inadequate. The typical dose range is 5,000 to 8,000 IU of vitamin D3 daily taken with a meal for better absorption. Annual blood tests can enable one to know if they are taking the proper dose of vitamin D they need to achieve optimal levels of 25-hydroxyvitamin D.

**What You Need to Know**

Defend Against Wintertime Risks

- Winter means greater vulnerability to infections, especially for aging individuals who face immune senescence.
- Influenza and pneumonia kill more than 55,000 people in the US every year, and vaccines often confer insufficient protection for aging individuals.
- The first step is to help protect against infections in the first place by taking a number of prophylactic agents that have been proven to boost the immune system.
- The second step provides protective agents that can be taken at the very earliest symptoms of an invading infection to provide an instant emergency response.
If you do not already maintain a blood level of 25-hydroxyvitamin D over 50 ng/mL, then take up to around 5,000–8,000 IU of vitamin D daily. If you already take around 5,000 IU of vitamin D daily, then you probably do not need to increase your intake.

**Throat Probiotic**

For those particularly susceptible to throat infections, the novel probiotic *S. salivarius* K12 produces a powerful, locally-acting class of compounds (lantibiotics), which may reduce throat-infection risk. In a 90-day, controlled clinical trial of volunteers with a history of strep throat or tonsillitis, this potent probiotic reduced the incidence of these infections by 84% compared to the previous year.27

Even during the six-month follow-up period, in which patients did not take the probiotic, they experienced a significant 62% reduction in episodes of strep throat or tonsillitis. This demonstrated that the protection from throat infections continues long after taking the probiotic.27 There were no reported treatment-related side effects or drop-outs reported.27

During winter months, some people dissolve in their mouth one 2-billion CFU (colony forming unit) lozenge daily.

**Enzymatically Modified Rice Bran**

Aging individuals are more vulnerable to viral (and other) diseases, in part because aging diminishes the functionality of natural killer (NK) cells.28

Scientists have uncovered an enzymatically modified rice bran that has been shown to increase NK-cell activity by up to 84%.29

Enzymatically modified rice bran is produced by exposing crude fiber from rice bran to enzymes isolated from the Japanese culinary mushroom shiitake (*Lentinula edodes*).30

In a four-month study conducted on individuals who were initially low in NK-cell activity, supplementation with one gram (1,000 mg) of enzymatically modified rice bran per day led to a four-fold increase in NK-cell activity at two months, compared to control responses. And at the end of four months, participants showed a seven-fold increase in NK cell activity.31

Consider adding 500 mg to 1000 mg daily during the wintertime virus season for added protection.

**Whey**

Whey protein has the established capacity to broadly fortify the overall immune system, including modulating the destruction of pathogens and the elimination of toxins.32,33

An array of studies showed whey to be superior to other commercially available protein sources in improving reactivity of the adaptive immune system,34-36 the system that is responsible for building up a pool of antigen-reactive antibodies.32

Mice supplemented with whey produced higher levels of white blood cells, lymphocytes, and cytokines—resulting in greater immune responsiveness and reduced infection severity.37

Adding one or two scoops daily of whey protein to a regimen provides biological components that have beneficial impacts on the immune system.

**Lactoferrin**

A component of mother’s milk, lactoferrin has well-documented immune-potentiating effects.38-40

Research shows that lactoferrin may stimulate macrophages,41 which in turn may help to induce cell-mediated immunity. Although many of these studies are on animals, lactoferrin is naturally present in humans, suggesting an innate human antimicrobial function.42,43

A study showed that lactoferrin inhibits viral infection by interfering with the ability of certain viruses to bind to cell receptor sites.39

A dose of 300-1,200 mg daily is suggested to provide yet another layer of protection during the wintertime virus season.
The Emergency Response Team

Prevention is always preferable. But if a microbe slips through the defenses, it is important to respond aggressively the instant that any symptoms of a cold or flu first appear. Doing so will help to stop the microbe dead in its tracks before it has a chance to gain a foothold—and will help ensure optimum health throughout the winter.

The following six components make an especially effective “emergency response protocol” and increase the body’s ability to fend off and avoid infection.

Cimetidine

You may be familiar with cimetidine (brand name, Tagamet®) as a drug sold over the counter in pharmacies to combat heartburn. But cimetidine has the unexpected beneficial side effect of boosting immune function. It does this by reducing the activity of T-suppressor cells, an action that prevents the immune system from prematurely shutting down a needed immune response. In this way, cimetidine can be particularly effective in blocking and killing viruses. Cimetidine also has other immune-modulating effects, such as increasing NK-cell activity and boosting levels of the immune stimulants interleukin-2 and gamma interferon.

Cimetidine: Potentially Serious Interactions with Other Medications

Cimetidine can cause increases in plasma concentrations of certain other drugs. Some of the drugs with which cimetidine can negatively interact include:

- Warfarin (Coumadin®), an anticoagulant,
- Sildenafil (Viagra®), a PDE5 inhibitor for erectile dysfunction,
- Phenytoin (Dilantin®), an anticonvulsant,
- Propranolol (Inderal®), a beta-blocker used to reduce blood pressure and heart rate,
- Nifedipine (Procardia®), a Ca²⁺-channel blocker primarily used to lower blood pressure,
- Diazepam (Valium®), an antianxiety medication, and
- Several tricyclic antidepressant drugs, lidocaine, theophylline (anti-asthmatic), and metronidazole (an antifungal).

In patients with poor liver or kidney function, and in elderly patients at risk for neuropsychiatric illness, cimetidine dosage should be reduced to 300 mg every 12 hours. Further reduction may be necessary depending upon patient tolerability.

Close monitoring of prothrombin time (PT) is recommended with the anticoagulant warfarin (Coumadin®), and careful adjustment of the anticoagulant dose may be necessary with cimetidine treatment.

Aging men with pre-existing erectile dysfunction who are using sildenafil (Viagra®) should be aware that cimetidine boosts drug exposure by almost 60%. Because of that, these men should strongly consider using a reduced dose of sildenafil (Viagra®) if also using cimetidine.

For all individuals who wish to add cimetidine to their winter-proofing protocol, this drug should only be taken for 3-5 days at the first onset of early flu-like symptoms.

Under no circumstances should cimetidine be taken for longer than 60 days.
Although taking cimetidine is a powerful way to temporarily turn up the immune system, it is not intended for extended use. When an emergency immune response is needed, take 800 mg daily for 3-5 days to boost immunity during this critical window, and then discontinue its use.

Cimetidine also has powerful interactions with certain other medications. Before taking cimetidine, read the package insert in case this drug is contraindicated with your current prescriptions. For a list of known interactions, please refer to the box on cimetidine risks accompanying this article.

**High-Allicin Garlic**

High-allicin garlic has shown strong antiviral effects and support for healthy immune function. When symptoms first appear, take 9,000 mg of high-allicin garlic once or twice a day. Be sure to take it before meals, as taking such high amounts of this highly potent form of garlic will cause painful stomach-esophageal burning if it isn’t followed immediately by food.

Don’t worry if it causes you to have a strong sulfur odor. Saturating the body with this pungent garlic is the antiviral objective.

**Aged Garlic Extract**

Aged garlic has unique, immune-boosting compounds that work differently than those found in high-allicin garlic. For a more complete emergency response to wintertime symptoms, add 3,600 mg of aged garlic extract to the protocol at the first sign of a cold.

**DHEA**

Dehydroepiandrosterone (DHEA) and its metabolites have demonstrated powerful immune-enhancing and antiviral effects. As soon as flu-like symptoms appear, take 25-100 mg of DHEA early in the day. DHEA helps mount an immune response while also protecting against dangerous inflammatory cytokine responses that sometimes occur in response to viral infections.

**Zinc Lozenges**

Rhinoviruses—some of the viruses that cause the common cold—attach to cell receptor sites in sinus and throat tissues and then replicate out of control. Zinc acetate lozenges can be effective in warding off the common cold because it binds to those same cell receptor sites, helping prevent rhinoviruses from taking hold.
At the first hint of a cold symptom, completely dissolve one 18.75 mg lozenge of zinc acetate every two waking hours. Do not exceed 8 lozenges daily, and do not use for more than three consecutive days. Fortunately, that should be all the time needed to block an invading cold bug from latching onto cells in your nose and throat.

It is critical to initiate zinc lozenges at the very first symptom of a common cold. Even if you are not sure a cold is manifesting, suck on at least one zinc acetate lozenge to ensure you are availing yourself of this protective effect. If you wait more than 24-48 hours after a cold manifests, zinc lozenges are of little value.

**High-Dose Melatonin**

Melatonin delivers broad-spectrum immune-enhancing effects and fights viral diseases.\(^5\)

At the first sign of flu symptoms, start taking 3 mg-40 mg of melatonin at bedtime. This will induce a powerful immune response, while also promoting the deep sleep needed to support the immune system’s ability to fend off infection.\(^52,53\)

**Summary**

Wintertime is virus season. For older adults, these infections can be potentially life-threatening. Between them, flu viruses and bacterial pneumonia kill 55,000 Americans annually, and vaccines provide inadequate defense for many elderly individuals. This article has laid out a two-pronged strategy for remaining healthy all winter and avoiding further weakening the immune system.

The first phase of this strategy provides an array of prophylactics that serves as a fortress against infection.

For prevention, not every one of these nutrients needs to be taken. *Cistanche, Reishi,* and *Pu-erh tea* may be all most people need to bolster their immune defenses. They also cost relatively little.

The throat probiotic may only be needed to be taken 90-days each year to gain protective benefits. It is good to keep on hand in case a sore throat manifests. This is also a low-cost item.

*Lactoferrin,* *whey,* and enzymatically modified rice bran have some overlapping immune benefits. They are more expensive than *Cistanche,* *Reishi,* and *Pu-erh tea* combination supplements. (*Cistanche* provides some similar benefits to lactoferrin-whey-rice bran.)

Most readers of this magazine already take sufficient vitamin C, DHEA, and vitamin D.

The second phase provides a team of emergency responders to be taken at the very earliest sign of symptoms to kill off infections before they become chronic.

Employing this two-pronged strategy can help protect your body against winter’s annoying—and even potentially deadly—infectious risks. ●

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**


Humans don’t manufacture vitamin C internally, so it must be obtained through dietary sources or supplements. Vitamin C is water soluble and needs to be constantly replenished.¹

Fortunately, a flavonoid known as dihydroquercetin functions as a vitamin C “supercharger” that helps maintain its concentration throughout the body.²,³

References

To order VITAMIN C with Dihydroquercetin, call 1-800-544-4440 or visit www.LifeExtension.com

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Zinc stimulates the activity of about 300 enzymes and fortifies the immune system.

Taking the best zinc lozenge is important for maintaining the body’s natural defense system during the cold season—and throughout the year.

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### Zinc Lozenges

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**References**


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Life Extension® researchers have developed an innovative formula with three natural extracts—Pu-erh Tea, Cistanche, and Reishi Mushroom—that supports a more youthful immune system.

Pu-erh tea
• Supports decreases in inflammatory IL-6 while boosting natural killer cells and naïve T cells.¹

Cistanche
• Supports longer lifespan in animals.²
• Optimizes the ratio of CD4 to CD8 cells, indicative of a more youthful immune system.²

Reishi
• Helps reduce biomarkers of immune senescence.³

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References

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Heartburn afflicts more than 40% of adult Americans.

When someone suffers frequent or painful heartburn bouts, they are often diagnosed with *gastroesophageal reflux disease* or GERD.

There remain widespread misconceptions about the underlying cause of heartburn.

Mass-advertising of drugs such as Nexium®, Prilosec®, and Prevacid® has convinced GERD sufferers that to relieve symptoms, they need to block production of acid in the stomach.

But the human stomach must operate in acidic conditions to digest food properly. And long-term use of GERD drugs (proton pump inhibitors) involves serious health risks—ranging from kidney and cardiovascular disease to increased mortality.

A common cause of GERD is a weakened sphincter muscle at the end of the esophagus that functions to keep food and acid in the stomach. When the sphincter fails to close properly, stomach contents back up into the esophagus, causing heartburn and increasing esophageal cancer risk.

A new weapon has been identified that targets GERD symptoms by helping to neutralize acid in the esophagus, while leaving stomach pH balance intact.

Human studies have demonstrated that this formulation’s compounds safely neutralize esophageal acidity—without disrupting gastric acid production. There were also clinically-measured improvements in esophageal peristalsis, which helps further prevent reflux.
How Acid Reflux Occurs

The human stomach is an extremely acidic environment, roiling with hydrochloric acid and protein-digesting enzymes—a necessary environment for the proper breakdown of large food molecules in preparation for further digestion and absorption in the small intestine. A thick lining of mucus separates the acidic stomach contents from the delicate walls of the stomach itself.

The long flexible tube known as the esophagus that connects the mouth to the stomach is not designed to withstand such harsh conditions. To keep the acidic stomach contents away from its delicate tissue, the esophagus relies only on gravity and a sphincter muscle at the lower end.

A heavy or fat-rich meal can slow stomach emptying and allow stomach pressure to overwhelm the lower esophageal sphincter, permitting highly corrosive contents to wash up, or reflux, into the esophagus. Many people suffer from transient relaxation of the sphincter muscle, triggering this problem unpredictably.

The result—whether called heartburn, acid reflux, or gastroesophageal reflux disease (GERD)—is a burning, painful, proinflammatory, and potentially dangerous condition that afflicts more than 40% of American adults during any given 12-month period.12

Why “potentially dangerous”? Because the prolonged exposure of acids and protein-digesting enzymes to the delicate cells of the lower esophagus can produce precancerous changes. One result, a condition called Barrett’s esophagus, which refers to abnormal changes in cells, is a precursor to esophageal cancer.7,13 Esophageal cancer is increasing at an alarming rate.14

Flaws in Conventional Treatment

Mainstream medicine has long targeted the wrong body organ to prevent and treat GERD, focusing on the stomach and the high level of acid it produces. As a result, pharmaceutical companies have taken advantage of the huge market stemming from this perceived “need” to reduce stomach-acid production. They have flooded consumers with advertising for a wide array of drugs designed to alter the pH balance of the stomach, which can have long-term adverse impacts on one’s health.

In 2013, more than 15 million Americans were prescribed GERD-relieving medication and many more bought this class of drug over-the-counter.1,15 These drugs include omeprazole, lansoprazole, pantoprazole, esomeprazole, and rabeprazole, sold under a variety of trade names such as Nexium®, Prilosec®, and Prevacid®.

Targeting stomach-acid production with these drugs does indirectly reduce reflux symptoms in the esophagus. The hidden side effects, however, constitute massive overkill and cause serious—and potentially fatal—health consequences.

Reducing the stomach’s acidity weakens its ability to serve as a barrier to infection. It can also contribute to nutrient malabsorption. More critically, the drugs used to reduce stomach acidity—known as proton pump inhibitors or PPIs—have serious risks.

Long-term use of proton pump inhibitors increases the risk of kidney disease,1,2 blood vessel calcification,16 nutritional deficiencies,17-19 cardiovascular disease,3,4 infection (including pneumonia),20-24 diarrhea,25-27 microbial disruption (dysbiosis),28-30 and bone fracture.19,31-33 And taking these drugs in high doses is associated with a 2.6-fold higher risk of death.5

So the challenge has been to neutralize acid and other stomach contents specifically in the esophagus without reducing stomach pH balance. This would enable GERD sufferers to reduce their dose of PPI drugs or steer clear of them altogether.

Neutralizing Acid in the Esophagus

Scientists zeroed in on three natural compounds that, working together, are perfectly suited for a safe, esophageal-protecting effect.

First, calcium carbonate has long been shown to act as an acid buffer and to promote neutralization of acid. Compared to swallowed minerals that work on the stomach, calcium carbonate in a chewable tablet form has been shown to reduce acidity in the esophagus.9,10

Studies have found that calcium carbonate in a chewable tablet form promotes esophageal motility. That is, it enhances the sequential, esophageal muscle contractions that help foods and liquids travel the
Within a half-hour of treatment, acid levels began dropping more effectively in those who had taken the chewable calcium carbonate tablets—compared to any of the swallowable tablet formulations. The chewable group's pH levels rose significantly in the esophagus, indicating much less acidity, compared to baseline and compared to the placebo group.9 The researchers were especially impressed that the chewable calcium carbonate—unlike proton pump inhibitor drugs—did not significantly decrease acid production in the stomach.9 These findings were supported by a second study that evaluated chewable calcium carbonate's effect on esophageal motility, meaning how well the esophagus can utilize peristalsis (wave-like motion induced by muscle activity) to move its contents from the mouth to the stomach.10 None of the other common anti-GERD medications can improve esophageal motility, and impairment of this function increases the risk of heartburn.

Human Trials with Calcium Carbonate

In one study, a group of 20 otherwise healthy individuals with a history of episodic heartburn were given food designed to induce that affliction—chili, cheese, raw onions, and cola.9 An hour after the meal, they were randomized into groups and given varying doses of calcium carbonate in chewable or swallowable tablets, an effervescent solution of bicarbonate of soda (baking soda), or a placebo. For 5.5 hours following the meal, the study team used esophageal and stomach probes to measure acid levels for all volunteers.
For this study, 18 heartburn sufferers were given a tablespoon of acid to swallow. Using esophageal pressure testing equipment, researchers then assessed the exact number of swallows and amount of time it took for each subject’s esophageal pH to naturally rise to 5.0—a much reduced acidity level.10

The same subjects were then given 1,500 mg of calcium carbonate in a chewable tablet, and the test was repeated. Results showed significantly improved esophageal pressure and contractions in the correct, downward direction. Acid clearance in the esophagus was markedly increased 30 minutes after chewing the tablet.

This study found that it took 20 swallows and 12 minutes to eliminate the acid without the calcium carbonate tablets. When the same group of people were given the calcium carbonate chewable tablets, it took only 12 swallows and six minutes to eliminate esophageal acid.10

Calcium is needed for muscle contraction; prompting the researchers to suggest that one factor in these positive results may have been the fact that the chewable calcium carbonate tablets delivered concentrated calcium directly to the esophagus, potentially triggering stronger contractions.10

**Clinical Validation of Deglycyrrhizinated Licorice Extract**

As mentioned earlier, deglycyrrhizinated licorice extract (DGL) was demonstrated to block inflammation by inhibiting certain enzymes and proinflammatory signaling molecules.38,39

Scientists conducted a randomized, placebo-controlled study, specifically designed to test this licorice extract’s anti-inflammatory effects on those suffering from functional dyspepsia—a chronic disorder of the upper digestive tract.11,40 The multiple symptoms can include heartburn, bloating, nausea, belching, and burning and pain in the epigastric area (the esophagus just above the stomach). Functional dyspepsia affects one in every ten people.40

The team enlisted 50 adult patients with functional dyspepsia. Subjects were randomly assigned either to a control arm that received a placebo or to an active arm that received 75 mg of deglycyrrhizinated licorice extract. Both placebos and extract were taken with a glass of water daily after food, in the morning and again at night.11 All volunteers were asked to complete a series of symptom and quality-of-life scales at baseline and after 30 days of treatment.

Patients supplemented with the licorice extract reported a significant 51% reduction in their overall symptom scores, while the placebo patients experienced only a 29% symptom decrease.11

Licorice-supplemented patients were also asked to rate themselves on a dyspepsia-specific scale that considered 10 gastrointestinal symptoms—upper abdominal fullness, upper abdominal pain, belching, bloating, early satiety, nausea, vomiting, regurgitation, heartburn, and loss of appetite. Results showed a 55% decrease in these dyspepsia symptoms in the licorice extract group, while placebo patients showed only a 19% reduction.11 A substantial 56% of the supplemented subjects demonstrated improvements in what is known as a global efficacy score—a special index for the overall response to 30 days of intervention—while placebo subjects showed a 0% improvement.11

The overall findings clearly demonstrate that these natural compounds provide fast heartburn relief, effective GERD prevention through improved esophageal motility, and symptom improvement in those with functional dyspepsia. No adverse events or side effects were reported in any of the studies.
Summary

The public misconception about the underlying causes of heartburn, or GERD, has resulted in widespread use of drugs that dangerously—and excessively—reduce stomach acid. But the human stomach requires acidity for proper functioning.

Proton pump inhibitor drugs have been found in observational research to seriously boost risk of illnesses ranging from kidney and cardiovascular disease to earlier mortality.

Human studies demonstrate that proper use of low-cost nutrients can safely neutralize esophageal acidity—without disrupting gastric acid production. They also improve esophageal motility, which helps prevent acid reflux and improves protection of delicate esophageal tissue.

Calcium carbonate, magnesium carbonate, and deglycyrrhizinated licorice extract have been shown to confer symptomatic relief from heartburn and dyspepsia.9-11,34

Those who seek to reduce or eliminate their reliance on proton pump inhibiting drugs should consider taking 1-2 chewable tablets containing these three nutrients after meals and at bedtime.

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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Aging is characterized by inflammation, glycation, mitochondrial decay, and loss of cellular structure/function. Mitochondrial Energy Optimizer provides the following nutrients to help neutralize these changes:

- **CARNOSINE**: As humans age, proteins in their bodies become damaged by glycation reactions. Glycation can lead to alterations of normal cell function. Carnosine is a powerful anti-glycating agent, and it protects neurons against protein carbonyl species associated with normal aging.1-5

- **PQQ**: This micronutrient has been shown to trigger the growth of new mitochondria in aging cells. PQQ also activates genes involved in protecting the delicate structures within the mitochondria.6-11

- **TAURINE**: Supports whole-body health and boosts new brain cell formation in the area of the brain connected to learning and memory.6

- **LUTEOLIN**: Systemic inflammation is involved in most consequences of aging. Culprits behind inflammatory reactions are pro-inflammatory cytokines, such as interleukin-6 and tumor necrosis factor-alpha. Luteolin is a flavonoid that has been shown to help suppress these inflammatory cytokines.12-16

- **BENFOTIAMINE**: Benfotiamine blocks multiple destructive biochemical pathways, including AGEs’ formation pathway,17-21 which is induced by higher than desirable blood glucose levels.18-22

- **PYRIDOXAL 5’-PHOSPHATE**: Pyridoxal 5’-phosphate is the active form of vitamin B6 that has been shown to protect against both lipid and protein glycation reactions.23-25

- **R-LIPOIC ACID**: A microencapsulated Bio-Enhanced® R-lipoic acid facilitates youthful mitochondrial energy output while guarding against free radicals.26-28

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EsophaCool neutralizes acid in the area of the esophagus where discomfort most often occurs.

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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.

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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.

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In profoundly troubling studies published in 2015-2016, acid reducing drugs called proton pump inhibitors, or PPIs, were associated with an increased risk of dementia.1-3

One of these studies found cognitive impairment in response to short-term use of drugs sold under the names Prevacid®, Nexium®, Protonix®, AcipHex®, and Prilosec®.2

People age 75 and older who use proton pump inhibitors have a 44% greater risk of developing dementia, including Alzheimer’s.1

As many as 70% of people taking proton pump inhibitors don’t require them.4 Thousands of cases of dementia may have been avoided if people weren’t overusing these drugs.

In this article we will examine how proton pump inhibitors pose a hidden long-term threat to our brains. We’ll discuss natural options that can help alleviate heartburn symptoms without increasing dementia and other health risks such as bone fractures, kidney failure, and stroke.5-10
Proton Pump Inhibitors Increase Dementia Risk

The recent studies showing an association between proton pump inhibitors and increased risk of dementia are frightening. These drugs are some of the most widely used in America, and their use among the elderly is on the rise. Proton pump inhibitors are most often used to fight heartburn, gastroesophageal reflux (GERD), and other painful disorders of the upper digestive tract. They are available over the counter and by prescription.

The most recent of the new studies appeared online in the Journal of the American Medical Association Neurology in February 2016. The researchers evaluated data collected over a 7-year period on nearly 74,000 participants age 75 and older who did not have dementia at the beginning of the study.

What they found was a strong statistical relationship between regular use of proton pump inhibitors and the risk of developing dementia. Those taking proton pump inhibitors were 44% more likely to develop dementia compared with those not using the drugs, even after statistical adjustments for age, sex, and the use of multiple medications.

The implications of this finding are enormous. An important editorial that appeared alongside the study’s publication puts these numbers in perspective. Given the size of the population at risk, that 44% increase could expand the overall incidence of dementia from 6% to about 8.4% per year. That would translate to roughly 10,000 new cases annually in this older age-group alone.

Of course, it did not take long for others in the mainstream medical community to attack these findings as an anomaly, concluding that “you don’t need to change therapies on the basis of concern about dementia.” The connection between Big Pharma and physicians is as strong as ever! But this is not the only study to make this unfortunate connection. Two studies published just last year validate the findings in separate ways, and with surprising consistency.

Findings Validated in Second Study

In a second study, researchers examined data from a large, longitudinal study (called the German Study on Aging, Cognition, and Dementia) among older patients in primary care. More than 3,300 people age 75 or older were followed up every 18 months for 6 years. Although they began the study with no signs of dementia, by the fourth follow-up, 431 had developed dementia, including 260 specifically with Alzheimer’s disease.

Patients who used proton pump inhibitor drugs during this time were found to have a 38% increased risk of dementia, and a 44% increase in the risk of Alzheimer’s, compared to those with no history of proton pump inhibitor use.

If this 44% figure looks familiar, it’s because it is the exact same percentage of increase in dementia risk the 2016 study found in proton pump inhibitor users. It seems highly unlikely that these closely-convergent findings are simply the result of coincidence.

Short-Term Proton Pump Inhibitor Impairs Cognition

A study published in 2015 examined the cognitive effects of short-term proton pump inhibitor use in otherwise healthy young adults. The rationale for this study was that, if proton pump inhibitors produce long-term mental decline, even short-term use might have a measurable effect on standard cognitive testing.

The study included 60 healthy volunteers ages 20-26 who had no signs of age-related cognitive decline, and who would be expected to perform normally on cognitive tests. The subjects were divided into six groups. Each of five groups received a different proton pump inhibitor drug (omeprazole, lansoprazole, pantoprazole, rabeprazole, or esomeprazole) for one week, while the sixth received a placebo.

After just 7 days of exposure to proton pump inhibitors, all of the drug recipients had a statistically and clinically significant impairment in cognitive functions.
They performed more poorly than at baseline on visual memory, attention, executive function (sorting and deciding on strategies), working memory, and planning functions. While all of the proton pump inhibitors impaired cognition, some were worse than others. Omeprazole (Prilosec®) was the worst offender, which reduced function on 7 subtests. Lansoprazole and pantoprazole influenced 5 subtests, rabeprazole, 4, and esomeprazole, 3.

These outcomes make it clear not only that proton pump inhibitors can impact brain function, but also that different drugs affect it in different ways. These changes occurred after just one week of treatment in healthy young adults. What are the likely effects in older adults, who are already more prone to cognitive decline, and who may have been exposed to proton pump inhibitors for years or even decades? And what could be the impact on overall rates of dementia as rates of proton pump inhibitor use continue to skyrocket?

Clearly, it is too soon to have the answers to these questions in human populations. But a number of basic science and animal lab studies have shed some light on why proton pump inhibitors are so closely connected to cognitive decline, as we’ll now see.

Proton Pump Inhibitor-Induced Brain Changes

One of the hallmarks of Alzheimer’s disease (as well as other kinds of dementia) is the accumulation of abnormal proteins in regions of the brain that are important for memory. The best-known of these is called beta-amyloid. One way beta-amyloid contributes to Alzheimer’s disease is by provoking inflammation that ultimately kills brain cells. Our brains have developed systems for clearing harmful beta-amyloid plaque from the body. Scientists believe that whether a person develops Alzheimer’s or not depends ultimately on whether we can clear out beta-amyloid faster than we produce it.

There is now strong evidence that proton pump inhibitors not only promote beta-amyloid production, but also impair the body’s ability to clear beta-amyloid plaques in the brain.
Proton Pump Inhibitors Prevent Removal of Beta-Amyloid Plaque

Proton pump inhibitors act by blocking the proton pumps that secrete acid in the stomach, which reduces acid levels. The problem is that the same mechanism of action also impairs acid production in the brain’s “cleanup cells,” which use the acid to break down beta-amyloid plaque so that it can be removed from brain cells.

Much of this cleanup work is shouldered by cells called microglia, which are immune system cells living in the brain.18,20 These cells are rich in lysosomes, which are essentially cellular garbage collectors that accumulate “junk” proteins (like beta-amyloid) and then break them down with intense bursts of acid.22,23

It has now been demonstrated that proton pump inhibitor drugs pass through the blood-brain barrier and reduce the amount of acid contained in the lysosomes.22 Additional studies have shown that the lysosomes in the brains of Alzheimer’s patients are less acidic than those of healthy people, which means they are less able to clear dangerous beta-amyloid.24,25

The bottom line is that proton pump inhibitor drugs interfere with one of the brain’s most fundamental self-cleaning mechanisms: the acidic destruction of toxic beta-amyloid proteins that trigger the cell death, inflammation, and neuronal dysfunction typical of Alzheimer’s disease.

While proton pump inhibitors have only been studied in this capacity in Alzheimer’s disease, it’s quite possible that they could have a negative impact on other neurodegenerative diseases. This is because the accumulation of abnormal proteins is also a main feature of diseases such as amyotrophic lateral sclerosis (ALS), Parkinson’s disease, and Huntington’s disease. And as with Alzheimer’s, the poor function and acidification of lysosomes has been implicated in these disorders as well.26,27

Proton Pump Inhibitors Increase Bone Fracture and Stroke Risks

In recent years, concerns about the long-term safety profile of proton pump inhibitors have been raised, including increased risk of bone fractures and stroke.

A 2011 meta-analysis published in The Annals of Family Medicine reported that high doses or long-term use of proton pump inhibitors is associated with an increased risk of bone fractures.33

Researchers confirmed these findings in a more recent and larger meta-analysis that led the authors to conclude that “…PPI [proton pump inhibitor] use modestly increased the risk of hip, spine, and any-site fracture.”34

In a shocking recent study, a group of researchers evaluated the use of proton pump inhibitors and the risk of first-time ischemic stroke. For the study, more than 240,000 adults (mean age 57 years) were included and an approximate 44% of the patients had filled a prescription for a proton pump inhibitor. Overall, the researchers found that those using proton pump inhibitors had a 21% greater risk of ischemic stroke, compared to nonusers.35
Alternatives to Proton Pump Inhibitor Drugs

There’s no question that proton pump inhibitor drugs are effective at reducing stomach acid and at alleviating painful heartburn and reflux symptoms. The problem is that they also interfere with needed acid production in other parts of the body, specifically in the brain, where insufficient acid may lead to the accumulation of toxic proteins. Does this mean you have to choose between heartburn and Alzheimer’s? No, there are alternatives that can safely alleviate the painful symptoms of heartburn without increasing the risk of Alzheimer’s.

A unique combination of two well-known nutrients, zinc and carnosine, has shown excellent effectiveness in people with stomach ulcers, especially in those cases associated with the bacterium *Helicobacter pylori*.28-30 These ingredients have also been shown to work together to reduce inflammation, which is itself a risk for stomach and esophageal cancers.31,32

Another approach is to use a raft-forming alginate. Alginates are complex carbohydrates that form a foamy gel on contact with stomach acid. They then float, like a raft, atop the stomach contents, preventing acid and other damaging gastric contents from refluxing up into the esophagus. *Raft-forming alginates* can prevent reflux symptoms such as heartburn.5-10

Raft-forming alginates have advantages over other treatments, including the fact that they do not alter the acid content in the stomach or the brain, and they act only locally in the stomach and are not absorbed into the bloodstream. And in addition to physically blocking stomach acids, they also block other erosive stomach contents such as protein-digesting enzymes, bile from the liver, and acidic foods/drinks from rising into the *esophagus*.8

Rising Burden of Dementia

Dementia (literally, “loss of mind”) is on the rise throughout the world and currently represents a leading cause of disability, heartbreak, and economic stress for its victims and their families alike.

According to the World Health Organization (WHO), dementia is broadly defined as “…deterioration in cognitive function (i.e. the ability to process thought) beyond what might be expected from normal aging. It affects memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. Consciousness is not affected. The impairment in cognitive function is commonly accompanied, and occasionally preceded, by deterioration in emotional control, social [behavior], or motivation.”36

In other words, dementia today means precisely what the word’s origins imply: loss of the human part of the mind.

Dementia is on the rise both in the United States and globally as populations live longer. Here are some of the troubling facts about the growing epidemic of dementia:36-39

- **47.5 million** people worldwide live with dementia today.
- About **7.7 million** new cases of dementia occur annually worldwide.
- The worldwide prevalence of dementia is expected to reach **75.6 million** by 2030 and to almost triple to **135.5 million** by 2050.
- People with mild cognitive impairment are up to **15 times** more likely to develop Alzheimer’s disease than those with normal cognition.
- Before death, most people with Alzheimer’s disease become dependent on caregivers, amplifying the number of people directly affected.
Improved Antacid Chewables

For decades, endless commercials were aired on television promoting the heartburn alleviating effects of antacid tablets like **TUMS®** and **Rolaids®**.

These kinds of antacids often relied on calcium (and sometimes aluminum) to partially neutralize stomach acid. They are laden with sugar and artificial flavors. These antacids did nothing to improve the protective barrier in the esophagus or reduce the acid-induced inflammation that can lead to serious gastroesophageal health problems.

A new chewable antacid has been developed that contains equal amounts of acid-neutralizing magnesium and calcium plus a special licorice extract that helps protect the esophageal lining from continuous inflammatory damage.

These new lozenges are sweetened with stevia and natural flavors, so they can safely be used daily without concern about dental enamel erosion and elevated blood glucose.

Summary

Acid reflux is a common condition among adults. Its prevalence has created a multibillion-dollar market for drugs to alleviate the symptoms. Proton pump inhibitors are the most popular drugs based on their effectiveness and ease of dosing.

Unfortunately, proton pump inhibitor drugs work all too well, blocking acid production not only in the stomach, but also in the brain’s “cleanup” cells. These cells require acid for the cleanup of “junk” proteins in brain cells such as beta-amyloid.

Clinical studies show that people on long-term proton pump inhibitor therapy have a significantly increased chance of developing dementia (and other problems like bone fractures).

In addition, taking proton pump inhibitors for as little as one week measurably impairs cognitive performance.

Fortunately, natural approaches like raft-forming alginates and new chewable antacid lozenges offer an alternative to proton pump inhibitors for those suffering from mild-to-moderate heartburn or reflux.

Those with severe heartburn or erosive esophagitis may be able to reduce their dose of proton pump inhibitors by substituting these natural approaches as often 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


The Overprescribing of Proton Pump Inhibitors

Proton pump inhibitors are currently the mainstay of treatment for conditions related to gastric and esophageal irritation by stomach acid, such as heartburn, gastroesophageal reflux, peptic ulcer disease, and more. They are the third top-selling drugs in America, with annual sales approaching $14 billion. Prescription-writing for these drugs increased more than 12% between 2009 and 2013.

Proton pump inhibitors effectively lower stomach acid and have relatively few short-term side effects. But, as more and more people use these drugs for longer periods, we are now discovering the potential damage they might cause.

That’s especially concerning in light of estimates that there is no appropriate indication for proton pump inhibitor use in 25%-70% of patients taking those drugs. Indeed, there has been growing concern about physicians’ readiness to prescribe them, particularly in older adults.

People taking proton pump inhibitor drugs should evaluate their real need for relief, discuss their situation with their physicians, and consider, when possible, alternate therapies that pose fewer risks.
Proton Pump Inhibitors and B12

Recent studies show a potential link between the use of proton pump inhibitors and dementia. One way proton pump inhibitors might affect brain function is by interfering with the absorption of vitamin B12.45

B12 is essential for normal cognition, and low B12 levels are not uncommon in older adults even in the absence of acid-reducing therapy.46

Because dietary B12 is tightly bound to proteins, it requires ample stomach acid to release it for absorption. This means that reducing stomach acid through the use of proton pump inhibitors may increase the risk for B12 deficiency. Experts now recommend testing B12 levels regularly for patients taking larger doses of proton pump inhibitors for long periods of time.45


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

Also available are 10 mg PQQ caps with BioPQQ® (Item #1500) and 100 mg Super Ubiquinol CoQ10 with BioPQQ® (Item #0173).

References

PQQ (pyrroloquinoline quinone) activates genes involved in the production of cellular energy.1-5 Studies show PQQ supports heart health and cognitive function, complementing CoQ10.6,7 In fact, just 20 mg per day of PQQ plus CoQ10 promotes memory and attention in aging individuals.8 BioPQQ® is the highest quality PQQ available on the market today.

20 mg PQQ Caps with BioPQQ®
This formulation contains 20 mg of PQQ per capsule, which is the recommended daily dose.

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Esophageal Guardian provides a protective shield for your upper digestive tract!

This good tasting, raft-forming alginate formula helps defend esophageal structures from harsh stomach contents.

Experience rapid relief that lasts up to 4 hours.

Esophageal Guardian
Item #01737 • 60 chewable tablets

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Non-GMO

EsophagCool works rapidly to provide soothing relief to the upper digestive tract!

This unique formula utilizes two acid-neutralizers along with proprietary licorice GutGard™. Natural flavors such as stevia enable a pleasant taste with no simple sugars.

Only two EsophagCool tablets provide soothing relief – fast!

EsophagCool
Item #02009 • 120 chewable tablets

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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

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To order Life Extension® Esophageal Guardian Natural Berry Flavor or EsophagCool, call 1-800-544-4440 or visit www.LifeExtension.com
Super R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels. This unique sodium-R-lipoate can help you reach peak plasma concentrations within just 10-20 minutes of supplementation.

Suggested dose is one to two capsules daily.

Preserve Youthful CELLULAR ENERGY with Next-Generation LIPOIC ACID

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

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

Super R-Lipoic Acid
Item# 01208 • 60 vegetarian capsules

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Suggested dose is one to two capsules daily.

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

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Non-GMO

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Beneficial bacteria called *S. salivarius* K12 sustain throat health. Each **FLORASSIST® Throat Health** lozenge has **2 billion** colony-forming units of *S. salivarius* K12 that:

- Maintain a balanced inflammatory response
- Help provide probiotic balance for throat health
- Maintain overall good health

**FLORASSIST® Throat Health**
Item #01920 • 30 lozenges • Non GMO

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Exposure to ultraviolet solar rays accelerates age-related visual loss. Enlightened individuals wear UV protection sunglasses outdoors to minimize sunray-induced ocular damage.

A new vision-robbing culprit has emerged that is more prevalent than sunlight exposure. Our round-the-clock use of smartphones and computers exposes our eyes to an unnaturally high amount of blue light. Research shows that blue light is damaging to the retina and other parts of our eye.1

Chronic exposure to blue light is associated with increased risk of developing age-related macular degeneration,1,4 a leading cause of blindness in older adults.5

Supplementing with multivitamins and xanthophyll carotenoids that include lutein, zeaxanthin, and meso-zeaxanthin have demonstrated intriguing effects for preventing or mitigating macular degeneration.6

If you use a smartphone or a computer on a daily basis, it is important to ingest xanthophyll carotenoids to protect your eyes from the damaging risks of blue light.
Preventing Blue Light-Associated Eye Diseases

Evidence that supplementing with lutein and zeaxanthin provides retina-protecting effects has been accumulating for years, even since before the explosion of blue light exposure now facing modern populations. As that threat has grown, however, so has the importance of knowing how best to protect our eyes against retinal damage, and particularly age-related macular degeneration.

Our natural protection against damaging light of all wavelengths, primarily ultraviolet (UV) and blue, comes from a layer of pigmented cells called the retinal pigment epithelium. These pigmented cells are rich in lutein, zeaxanthin, and other carotenoids derived from our diet.

Carotenoids have a unique molecular structure that enables them to soak up intense blue wavelengths, thus sparing the delicate rod and cone cells in our eyes that convert light energy into electrical impulses. Once those cells burn out, they are gone for good—retinal cells cannot normally regenerate.

Ophthalmologists now recognize that the density of pigmented cells in the macula, or central portion of the retina, is closely associated with the degree of protection provided to retinal cells. This measure, called macular pigment optical density, is now considered a strong indicator of retinal health, and is therefore the main outcome measure in most studies of natural supplements with protective properties.

To date, studies reveal strong and consistent benefits of lutein, zeaxanthin, and meso-zeaxanthin on retinal health and resistance to development of age-related macular degeneration, as measured by improvements in macular pigment optical density. The strongest evidence, as is usually the case, comes from studies of early age-related macular degeneration, reinforcing the idea that early prevention is vastly superior to late attempts at cures.

Studies of early age-related macular degeneration have shown that lutein, zeaxanthin, and meso-zeaxanthin increase macular pigment optical density with continued supplementation (generally one or more years).

This increase in macular pigment optical density is presumed to account for most of the protective effect of these nutrients.

A growing body of evidence reveals that boosting one’s intake of omega-3s and carotenoids like lutein helps maintain healthy eyes.
In a 2013 study, patients with early/mild age-related macular degeneration were supplemented once- or twice-daily with lutein, zeaxanthin, low-dose omega-3s (100 mg DHA, 30 mg EPA), and antioxidant nutrients for one year. The result showed improved macular pigment optical density, while macular pigment optical density was reduced in unsupplemented placebo recipients.15

By 2016, sufficient data from many studies on this subject have been published to allow for a powerful meta-analysis, in which results from multiple small studies are analyzed as one large group. This study evaluated 20 clinical trials involving 938 patients with macular degeneration and 826 control subjects.16 It showed that supplementation with the xanthophyll carotenoids, including lutein, zeaxanthin, and meso-zeaxanthin, was consistently associated with significant increases in macular pigment optical density. This benefit was found in patients with macular degeneration and in currently healthy subjects. This meta-analysis showed that trials using meso-zeaxanthin produced the greatest increases in macular pigment optical density, suggesting that this nutrient is an important addition to lutein/zeaxanthin supplements for eye health.

What You Need to Know

The Importance of Retinal Protection

- Energetic wavelengths of blue light are powerfully destructive of the eye’s most essential components, the vision receptors in the retina, which are most highly concentrated in the macula, or central portion.

- Human eyes contain adequate protection against natural levels of blue light, but that protection wanes with age, as the light-absorbing pigments lutein and zeaxanthin fade out of the retinal pigment layer.27

- Worse, in today’s technologically-oriented society, we face historically high levels of exposure to blue light from our numerous computer, phone, tablet, and television screens.1

- Excessive blue light exposure is expected to cause increased rates of age-related macular degeneration as the baby-boom generation ages, the first in history to be bathed in such intense blue light.1

- Replacing the carotenoid pigments in the eye’s protective layer, however, is an effective means of quenching much of the phototoxic damage done by blue light.

- Studies show that the progression of age-related macular degeneration can be effectively slowed with regular supplementation with lutein, zeaxanthin, and meso-zeaxanthin.28

- Retinal damage is irreversible, so early and powerful protection is our only hope, and supplementation with these carotenoid nutrients is a clinically-validated means of gaining that protection.
Improving Vision

Improvements in **macular pigment optical density** provide protection against **blue light** damage. But is it possible lutein, zeaxanthin, and other carotenoids can also **improve** vision?

Vision can be measured in a number of ways. Visual acuity is derived from some version of the familiar Snellen eye chart (the chart of letters used by doctors to test your eyes), and indicates how well a subject sees objects at fixed distances.

Visual acuity has now been shown to be increased in at least one study of lutein, zeaxanthin, and omega-3 fatty acids, along with the expected increases in protective pigment density, in those with early age-related macular degeneration. Indeed, a landmark 2015 meta-analysis of eight such studies reported improvements in visual acuity in response to lutein and zeaxanthin supplementation in people with age-related macular degeneration. This analysis also revealed a close association between supplement-induced increases in macular pigment optical density and **visual performance**.

Another, higher-tech approach to determining visual responses to supplementation is to use an **electroretinogram**. This device measures the minute electrical impulses produced by retinal cells in response to light.

A 2016 study demonstrated that, in addition to significant increases in **macular pigment optical density** with **lutein** supplementation, there was also a significant increase in how quickly retinal cells responded to light stimuli, as measured by the **electroretinogram**.

All of the data point to one conclusion—that the combination of lutein, zeaxanthin, and, ideally, meso-zeaxanthin has real effectiveness at restoring the eye’s natural blue light shield, the **macular pigment epithelium**, which should protect against progression of age-related macular degeneration. Indeed, this large body of evidence has resulted in a change in ophthalmologists’ recommendations about eye-protective supplements.

While the supplement formula recommended by the original **Age-Related Eye Disease Study** (AREDS) included beta carotene as the only carotenoid, subsequent studies, including the more recent AREDS-2, found that replacing beta carotene with the combination of **lutein** and **zeaxanthin** produces superior risk reduction for developing the most serious forms of macular degeneration. That replacement alone produced an 18% reduction in the risk of developing late age-related macular degeneration, and a 22% reduction in risk of developing the blindness-inducing “wet,” or neovascular, macular degeneration.

When blue light strikes the retina, a variety of photochemical reactions take place.
How the Carotenoids Protect Eyes Against Blue Light Damage

When blue light strikes the retina, a variety of photochemical reactions take place. These include intense oxidative damage, as light photons energetically interact with oxygen-rich blood, producing reactive oxygen species. These caustic compounds then attack the vital fats that form nerve and light-receptor cell membranes, impairing their function.

Worse, all of this chemical reactivity triggers inflammatory signals and changes in gene expression that perpetuate the retinal injury, which, in turn, triggers further oxidative stress in a vicious cycle.

The carotenoids lutein and zeaxanthin are already well known for their ability to absorb energetic blue light radiation, and for preventing development, and promoting scavenging of, reactive oxygen species. Recent studies have found that these compounds also promote an anti-inflammatory environment in retinal cells.

In fact, those studies show that retinal cells have an active mechanism for concentrating lutein and zeaxanthin within their cytoplasm, producing up to 14-fold higher concentrations within the cell than in the medium surrounding them.

Other studies have shown that the anti-inflammatory effect of these nutrients extends beyond the local environment of the eye, producing what seem to be body-wide effects.

In the specific context of age-related macular degeneration, these same carotenoids have been shown to prevent the development of overgrown blood vessels that produce the blindness-inducing “wet” form of macular degeneration. This again is a consequence of the ability of these vegetable-derived carotenoids to shield eye structures from blue light damage.

Summary

Modern technology has increased the risk of retinal damage and macular degeneration with a host of electronic devices whose screens project blue light.

Scientists are just now beginning to recognize the threats posed by chronic blue light exposure at work, at home, and even during recreational activities throughout the day and night.

A clinically-validated means of mitigating this blue light-induced retinal damage is to supplement with carotenoid nutrients, particularly lutein, zeaxanthin, and meso-zeaxanthin.

As with so many nutrients, the multiple mechanisms by which carotenoids like lutein and zeaxanthin operate to protect tissue is a direct mirror of the multiple mechanisms that nature has created to protect our eyes. These nutrients provide protection from the moment a blue light photon enters the eye, shielding the irreplaceable light-sensing cells from photochemical damage. We now recognize that these compounds also act to slow the inflammatory reactions that aggravate light-induced damage, and they can prevent development of blood vessel overgrowth that produces “wet” macular degeneration, the leading cause of age-related blindness.

Those who spend a significant amount of time in front of a television, computer, tablet, or smartphone should ensure adequate intake of lutein, zeaxanthin and meso-zeaxanthin to reduce their risk of catastrophic vision loss.

Readers of this publication have been using lutein, zeaxanthin and meso-zeaxanthin supplements for many years to protect against solar eye damage. It’s comforting to know these same nutrients also afford protection against indoor blue light.

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


Lactoferrin provides support for the body’s immune system.\textsuperscript{1,2}

In addition, new research shows lactoferrin increases tear production following cataract surgery by 95\% and tear break-up time by 77\%, which promotes eye protection.\textsuperscript{3}

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References

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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.

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**References**

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**MacuGuard® Ocular Support** provides lutein, trans-zeaxanthin, and meso-zeaxanthin to help maintain structural integrity of the macula and retina.¹⁵

**Alpha-carotene** is included based on new evidence that it helps support the macular pigment.¹

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.⁶⁸

**Just one daily softgel of the new MacuGuard® Ocular Support formula provides:**

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Each bottle lasts for **two months**.

**MacuGuard® Ocular Support** is also available with Astaxanthin. Retail price is $44. If you buy four bottles during Super Sale, price is reduced to **$27** per bottle. (Item #01993).

Many people already obtain astaxanthin by taking Astaxanthin with Phospholipids (Item #01923), Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin (Item #01988), and Krill Healthy Joint Formula (Item #01600).

Avoid use during pregnancy.

**References**


To order **MacuGuard® Ocular Support**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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For Premium-Quality Products

Life Extension® customers take extraordinary steps to stave off disease and aging while attaining optimal health. When customers buy products from Life Extension, they are assured of receiving the highest-quality products based on the latest published scientific studies that demonstrate benefits. The discounts available to consumers enable them to purchase premium-quality supplements at prices below those charged by commercial companies. These pages provide examples of savings customers can enjoy during the annual SUPER SALE. Each purchase at these discount prices qualifies for valuable Rewards Dollars that reduce your cost of future orders.

To order call toll-free 1-800-544-4440

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Retail Price</th>
<th>SUPER SALE Price Per Bottle</th>
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<tr>
<td><strong>Super Bio-Curcumin®</strong> • 400 mg, 60 vegetarian capsules, Item #00407</td>
<td>$38</td>
<td>$23.63</td>
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<tr>
<td>Super-absorbable formulation absorbs up to 7 times greater than conventional curcumin. Each bottle lasts two months.</td>
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<td><strong>FLORASSIST® GI with Phage Technology</strong> • 30 liquid vegetarian capsules, Item #02125</td>
<td>$33</td>
<td>$20.25</td>
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<td>Dual-encapsulation technology delivers potent doses of the six probiotic strains, plus phages to selectively target unwanted intestinal bacteria.</td>
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<td><strong>Vitamin D3</strong> • 5,000 IU, 60 softgels, Item #01713</td>
<td>$10</td>
<td>$5.85</td>
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<td>High-potency vitamin D in a softgel to provide greater absorption into the bloodstream.</td>
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<tr>
<td><strong>Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™</strong></td>
<td>$62</td>
<td>$35.10</td>
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<td>100 mg, 60 softgels, Item #01426</td>
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<td>The superior ubiquinol form of CoQ10 plus a natural compound (shilajit) shown to double mitochondrial CoQ10 levels.</td>
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<tr>
<td><strong>Once-Daily Health Booster</strong> • 60 softgels, Item #01991</td>
<td>$54</td>
<td>$34.20</td>
<td>(four-bottle purchase)</td>
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<tr>
<td>Just one softgel contains a variety of valuable nutrients, including two forms of vitamin K2, blueberry extract, gamma tocopherol, sesame lignans, chlorophyllin, lycopene, and a carotenoid blend that contains trans-zeaxanthin, meso-zeaxanthin, and lutein. Taken individually these ingredients would cost 2 to 3 times more!</td>
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<td><strong>MacuGuard® Ocular Support</strong> • 60 softgels, Item #01992</td>
<td>$25</td>
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<td>Offers triple eye protection with meso-zeaxanthin, lutein, and trans-zeaxanthin.</td>
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<td><strong>Extend-Release Magnesium</strong> • 60 vegetarian capsules, Item #02107</td>
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<td>Provides immediate-release magnesium citrate along with a 6-hour extended-release magnesium for optimal benefits.</td>
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<td>$16</td>
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<td>A hormone that protects against age-related decline, benefits overall health.</td>
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<td><strong>PQQ Caps with BioPQQ®</strong> • 10 mg, 30 vegetarian capsules, Item #01500</td>
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<td>Promotes generation of new mitochondria in aging cells.</td>
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<td><strong>Mitochondrial Energy Optimizer with BioPQQ®</strong> • 120 capsules, Item #01868</td>
<td>$72</td>
<td>$43.20 (four-bottle purchase)</td>
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<tr>
<td>This <em>glycation-protection</em> formula helps maintain cellular function, protein structural integrity, and mitochondrial biogenesis. It contains high potency <em>carnosine</em> along with <em>R-lipoic acid</em>, PQQ, <em>benfotiamine</em>, <em>luteolin</em>, and <em>taurine</em>. These ingredients cost far more if taken separately.</td>
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<tr>
<td><strong>Cognitex® with Brain Shield®</strong> • 90 softgels, Item #01896</td>
<td>$60</td>
<td>$35.10 (four-bottle purchase)</td>
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<tr>
<td>Optimal support for the brain. Includes gastrodin, alpha-glyceryl phosphoryl choline, vinpocetine, phosphatidylserine, uridine-5'-monophosphate, and more. Available with or without pregnenolone.</td>
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<tr>
<td><strong>Super K with Advanced K2 Complex</strong> • 90 softgels, Item #01834</td>
<td>$30</td>
<td>$18.23 (four-bottle purchase)</td>
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<tr>
<td>Provides two forms of vitamin K2 (1,000 mcg of immediate-release MK-4 and 200 mcg of long acting MK-7), along with 1,500 mcg of K1.</td>
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<td><strong>Memory Protect</strong> • 36-day supply, Item #02101</td>
<td>$24</td>
<td>$14.40 (four-box purchase)</td>
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<tr>
<td>This new product contains microdose <em>lithium</em> and <em>proline-rich polypeptide</em>, which have been found to block and (in the case of proline-rich polypeptide) to inhibit cognitive decline.</td>
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<td><strong>European Milk Thistle</strong> • 60 softgels, Item #01922</td>
<td>$28</td>
<td>$16.88 (four-bottle purchase)</td>
</tr>
<tr>
<td>High-absorption phospholipid-enhanced formula delivers nearly 5 times more active components to the bloodstream to support detoxification processes as well as promote liver health and function.</td>
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<tr>
<td><strong>ArthroMax® Advanced w/UC-II® &amp; ApresFlex</strong> • 60 capsules, Item #01618</td>
<td>$36</td>
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<tr>
<td>Promotes joint health and may promote comfortable joint structure and function.</td>
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<td><strong>Super R-Lipoic Acid</strong> • 300 mg, 60 vegetarian capsules, Item #01208</td>
<td>$49</td>
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<td>Superior efficacy compared to alpha-lipoic acid—supplies 240 mg of stabilized R-lipoic acid.</td>
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<td><strong>Advanced Bio-Curcumin® with Ginger and Tumerones</strong> • 30 softgels, Item #01924</td>
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<tr>
<td>Absorbs up to 7-times better, with added benefits of ginger and turmeric extracts.</td>
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Combat the *Silent Dangers of High Uric Acid*

Elevated blood levels of **uric acid** are present in about **21%** of Americans.¹

People frequently associate high uric acid levels with **gout**, yet many symptom-free individuals have **elevated** uric acid for years **before** getting their first gout attack.²

Gout is not the only manifestation of elevated uric acid blood levels. When uric acid levels are **higher** than optimal, there’s also an **increased** risk of coronary artery disease, cerebrovascular disease, and early mortality.³–⁶

Excess uric acid can be caused by aging, adverse lifestyle habits, hypertension, diabetes, kidney problems, and obesity⁷–⁹—which alone increases risk of elevated uric acid almost **three-fold**.⁹

While mainstream medicine offers **drugs** that reduce uric acid levels, they are primarily restricted to those who have already been diagnosed with gout.¹⁰,¹¹

Fortunately, scientists have found a **plant extract** that safely delivers uric acid-reducing effects.⁸

In this article, you will learn about a **tannin-rich** fruit that was shown in a **controlled human** trial to safely **reduce** uric acid to healthy **target** levels in **88.8%** of study subjects.⁸
How Excess Uric Acid Occurs

Excess levels of organic compounds known as purines break down into uric acid—a waste product excreted through urine. When excess levels of uric acid build up in the blood, a person is diagnosed with hyperuricemia.\textsuperscript{12,13}

Two factors cause hyperuricemia:

- A sufficient amount of purines are naturally made by the body to serve functions in DNA, RNA, and neurotransmission. When too much purine comes from dietary choices such as meats, poultry, seafood, and beer, just about all of these dietary purines are converted to uric acid.\textsuperscript{14}

- In about 90% of hyperuricemia cases, under urinary excretion is the primary cause, with excess uric acid production accounting for just 10%.\textsuperscript{15}

About 5% to 8% of adult males have asymptomatic hyperuricemia.\textsuperscript{5,16,17} Uric acid 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).\textsuperscript{18,19}

A long-term buildup of uric acid results in solid deposits of a salt called monosodium urate monohydrate—forming needlelike crystals in the joints, soft tissue, and organs throughout the body.\textsuperscript{13}

Affecting millions of Americans, this can lead to the arthritic inflammation behind painful attacks of gout and other diseases related to high uric acid.\textsuperscript{1,20-22} When the serum uric acid level exceeds 9.0 mg/dL, the probability of developing clinical gout is 6 times higher.\textsuperscript{8,16,17}

Aside from pain so excruciating that some sufferers cringe at the thought of putting a sheet over their foot at night, gout is associated with higher risks of cardiovascular disease and mortality.\textsuperscript{1,23,24}

Gout is best known for causing pain focused in the big toe. However, gout can also attack the:

- Instep,
- Ankle, Achilles tendon,
- Heel, Wrist,
- Knee, Finger, and
- Elbow.

A recent study found that 52% of individuals with asymptomatic hyperuricemia and 68% of gout patients also have knee osteoarthritis.\textsuperscript{25}

A gout attack can be triggered at any time by a range of factors, including alcohol, certain medicines, other illnesses, or stress.\textsuperscript{1,26,27} Those whose uric acid is increasing due to age and other factors need to take action to reduce these levels long before they suffer their first gout attack—to help prevent damage to joints, soft tissue, and organs, or even the onset of cardiovascular or kidney disease.
One of the most common side effects of the gout medication febuxostat is liver problems. But the drug’s manufacturer advises that, “A small number of heart attacks, strokes, and heart-related deaths were seen in clinical studies.” Other common adverse effects include nausea, rash, and—ironically—joint pain and gout flares.10

Two other drug options, allopurinol and probenecid, have been linked to side effects ranging from skin rash to breathing difficulties and unusual bleeding.28,29 And it was recently found that allopurinol does not always decrease serum uric acid—which is the whole point of taking it and enduring adverse risks.30

Incredibly, some gout medicines can precipitate gout symptoms.13

The drug colchicine is often prescribed for treatment of gout. It has been sold as a low-cost generic since the 19th century in the US—far predating the establishment of the FDA, which in 2009 granted one firm a three-year marketing monopoly on colchicine for the prevention of acute gout flares in return for the firm’s agreement to conduct studies on effectiveness, safety, and dosage. As a result of the government-mandated monopoly, colchicine’s price skyrocketed from nine cents a pill to almost $5 a pill.35

Aside from its cost, colchicine is associated with nausea, abdominal pain, diarrhea, generalized weakness, and even vascular and kidney damage.36

A Natural Alternative for Hyperuricemic Individuals

An enzyme called xanthine oxidase is involved in the body’s production of uric acid.

A natural agent with the power to safely inhibit production of xanthine oxidase would mark a big advance in the quest to reverse high uric acid levels without side effects.

Terminalia bellerica
A tree fruit extract has been studied for its ability to inhibit uric acid production in humans. An extract of the *Terminalia bellerica* fruit is rapidly emerging as a natural uric acid lowering nutrient.

The fruit of the *Terminalia bellerica* tree has been used in Ayurvedic medicine for many years, mainly for removal of kidney stones and decreasing inflammation. The extract being studied is derived from this edible tree fruit that contains 15% tannins.

Research suggested that the bioactive compounds in this *Terminalia bellerica* fruit provide anti-inflammatory effects, possibly due to inhibition of inducible nitric oxide synthase (iNOS). Researchers have reported this extract’s effectiveness against painful or burning urination, urine discharge, and bleeding in the kidney, and its ability to help remove blocked kidney and urine stones. Scientists found that this extract, with its potent tannin content, also appeared to inhibit xanthine oxidase—which in turn should decrease uric acid levels. The real challenge, however, was whether *Terminalia bellerica* would prove, in a controlled setting, to be effective in humans who are already hyperuricemic.

**Reversing Elevated Uric Acid Levels in Humans**

To determine the efficacy and safety of this fruit extract in hyperuricemic humans, scientists designed the most rigorous type of study—a long-term, randomized, double-blind, placebo-controlled human clinical trial, the kind that the FDA mandates before it approves new drugs. This clinical trial involved an active arm of volunteers that received different doses of the fruits of two different species of the *Terminalia* tree, an arm that received a uric acid-lowering drug (febuxostat) and a similar group that received an inactive placebo.

A total of 110 volunteers with hyperuricemia were divided into five groups and evaluated periodically over 24 weeks. Scientists assessed their uric acid levels, other health indicators, and side effects before treatment started and again at four weeks, eight weeks, 12 weeks, 16 weeks, 20 weeks, and 24 weeks of therapy. So both efficacy and safety were evaluated at six points during the 24 week-study.

Every visit, patients were questioned about possible adverse effects. At the outset and again at 24 weeks, a lab analysis assessed hematological, hepatic, and renal biochemical parameters. Each participant received a contact number to report any potentially adverse event and to access medical help.

The five groups of hyperuricemia patients received treatment as follows:

- **Group 1:** *Terminalia chebula*—one 500 mg capsule twice daily after food,
- **Group 2:** *Terminalia bellerica*—one 500 mg capsule twice daily after food,
- **Group 3:** *Terminalia bellerica*—one 250 mg capsule twice daily after food,
- **Group 4:** Febuxostat (Uloric)—one 40 mg tablet in the morning after food, plus an identical placebo capsule in the evening after food, and
- **Group 5:** Placebo capsules—one capsule twice daily after food.

The study team analyzed the data to directly measure the effectiveness and safety of the two *Terminalia* extracts relative to each other, the drug, and the placebo. They paid particular attention to the percentage of patients in each group whose uric acid levels were reduced to the healthy target of below 6.0 mg/dL.

**How Uric Acid Levels Become Too High in Some Individuals**

The body receives purines from two sources. First, it synthesizes its own purines, which are important for the synthesis of nucleic acids, the building blocks of DNA and RNA as well as for neurotransmission. Second, purines come from dietary choices such as meats, poultry, seafood, and beer.

Since the body produces all the purines it needs, purines from food sources result in excess amounts that are converted to uric acid. Lifestyle habits can play a role.

Excess uric acid is usually eliminated via urine. However, some individuals have impaired uric acid excretion, which accounts for about 90% of all hyperuricemic cases.
Results of Human Study

Researchers found an average reduction in uric acid levels at all six visits for all treatment groups except the placebo group, in which uric acid increased over 24 weeks.8

For the treatment groups, uric acid decreased over 24 weeks by an average of:8

• 16.02% in the 500 mg Terminalia chebula group,
• 27.59% in the 500 mg Terminalia bellerica group,
• 14.05% in the 250 mg Terminalia bellerica group, and
• 48.79% in the 40 mg febuxostat drug group.

And the percentage of volunteers who attained the uric acid target of 6 mg/dL or less was:8

• 11.76% in the 250 mg Terminalia bellerica group,
• 22.2% in the 500 mg Terminalia chebula group,
• 88.8% in the 500 mg Terminalia bellerica group, and
• 100% in the 40 mg febuxostat drug group.

Researchers were impressed that almost nine out of ten volunteers who took 500 mg of T. bellerica twice daily achieved the target level. All 10 volunteers taking febuxostat did so, but this drug has known and potentially lethal side effects that are difficult to identify in 24 weeks—yet early adverse effects were observed even in this short period.8

All hematological and biochemical parameters were within normal limits at the outset, but of the 18 volunteers on febuxostat, two completed the study with elevated total bilirubin and one complained of nausea and vomiting. (Bilirubin is the yellow byproduct of heme breakdown, and elevated levels can indicate certain diseases.) Also, one subject in the T. chebula group had mild gastrointestinal intolerance.8

Most significantly, not one volunteer taking T. bellerica had any adverse effect at all,8 which is in line with prior research showing no toxicity in rats given massive doses of T. bellerica, ranging from 300 mg to 5,000 mg per kilogram of body weight.32,33

These findings demonstrate that 500 mg of Terminalia bellerica twice daily significantly reduces uric acid levels without the long-term risks of febuxostat therapy.

Critically, this natural extract is available without prescription to gout sufferers and anyone wishing to lower uric acid levels before gout develops. By contrast, the febuxostat manufacturer stipulates that this risky drug “…is not for the treatment of high uric acid without a history of gout.”10

Lifestyle Factors That Affect Uric Acid Levels

A few lifestyle tips that can help prevent hyperuricemia include:

• Avoid excessive alcohol. Drinking too much alcohol can interfere with the removal of uric acid from the body, and underexcretion is the primary way these levels accumulate.
• Limit dietary purines. This includes red meats, pork, lamb, and seafood.
• Maintain a healthy weight. Increased adiposity is associated with increased uric acid levels and gout risk.
• Optimize kidney health. Since underexcretion causes 90% of hyperuricemia cases, improving and maintaining kidney function is important.
• Optimize thyroid function. Hypothyroidism is associated with the excess uric acid levels that lead to gout.
• Lower lead levels in your body. Chronic lead exposure is linked to some cases of gout.
• Minimize use of prescription diuretics. Medications that increase urine flow are associated with excess uric acid and development of gout. Talk to your doctor if you’re at increased risk for gout and discuss alternatives to diuretics.
• Treat sleep apnea. A study found that sleep apnea is an independent risk factor for high uric acid and gout.34
Summary

High levels of uric acid can damage joints, soft tissue, and organs, and boost the risk of kidney, coronary artery, and cerebrovascular diseases.

Drug options to reduce uric acid levels are primarily reserved for those with full-blown gout—leaving hyperuricemic individuals without easy options.

Uric acid-lowering drugs involve risks of adverse effects, including liver problems, breathing difficulties, vomiting, and unusual bleeding.

_Terminalia bellerica_ is a tannin-rich extract that appears to inhibit xanthine oxidase, an enzyme involved in uric acid synthesis.

In volunteers with elevated uric acid levels, twice-daily capsules of 500 mg of _T. bellerica_ enabled nearly nine out of 10 people taking the extract to achieve the target level of serum uric acid of under 6 mg/dL, with no adverse side effects.

<table>
<thead>
<tr>
<th>Mean Percentage Change in Serum Uric Acid Levels by Treatment Agent</th>
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<tr>
<td><strong>A</strong> - Terminalia chebula 500 mg</td>
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<tr>
<td><strong>B</strong> - Terminalia bellerica 500 mg</td>
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<td><strong>C</strong> - Terminalia bellerica 250 mg</td>
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<td><strong>D</strong> - Febuxostat 40 mg</td>
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<td><strong>E</strong> - Placebo</td>
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Scientists conducted a well-designed, 24-week, randomized, double-blind, placebo-controlled, parallel-group study to assess the efficacy and safety profile of _Terminalia bellerica_ in reducing high uric acid levels. Twice-daily dosages of 500 mg of _T. bellerica_ reduced serum uric acid levels by a mean of 27.59%—allowing 88.8% of those with hyperuricemia to attain the target uric acid level of 6 mg/dL, without any of the side effects observed in gout patients taking febuxostat. The manufacturer of febuxostat does not endorse its use in hyperuricemia patients who have not yet progressed to having gout.

Life Extension’s comprehensive blood test panels include uric acid measurement. Feel free to call Life Extension at 1-800-544-4440 if you need a reminder of what your last uric acid reading was. We retain blood test results of our customers back to year 2012, which is an important benefit to having your blood tests done utilizing our low-cost program that allows you to have blood draws performed at your convenience, with quick turnaround, wellness advisor input, and free access to prior results.

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

References

**Blood Testing**

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

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<td></td>
<td>Creatinine</td>
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<td>eGFR (estimated glomerular filtration rate)</td>
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<td>Globulin</td>
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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.

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ArthroMax® Herbal Joint Formula

Promotes Joint Comfort and Cartilage Health

ArthroMax® Herbal Joint Formula contains plant extracts that have been shown to support the comfort of weight-bearing joints, such as hips and knees—and help support their cartilage structure as well.

Just two daily capsules of this new herbal formula provide:

Mobile-Ease™ Proprietary Blend 900 mg
(white mulberry, Chinese skullcap, cutch tree)

ArthroMax® Herbal Joint Formula
Item #02108 • 60 vegetarian capsules

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To order ArthroMax® Herbal Joint Formula, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: Consult your healthcare provider before use if you are taking medication or have a medical condition. Do not use if pregnant, lactating, or under age 18.

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

---

Ayuric® is a registered trademark of Natreon, Inc. with patents pending.
Researchers at Harvard Medical School and Cleveland Clinic have been investigating omega-7, a fatty acid with body-wide benefits. Their focus has been on how omega-7 promotes a healthy metabolism.

Provinal® Omega-7 is becoming a popular nutrient used to enhance omega-3s by providing the following systemic effects:

- Supports a healthy, stable weight
- Increases satiety hormones
- Regulates fat production within fat cells
- Helps smooth arterial walls
- Supports cardiovascular health
- Supports cellular glucose shuttling
- Supports insulin sensitivity
- Supports healthy triglyceride and cholesterol levels already within normal range

Provinal® Purified Omega-7
Item #01812 • 30 softgels

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Probiotic Blend with Phage Technology

Dual Encapsulation for Optimal Delivery

FLORASSIST® GI with Phage Technology combines four types of phages, along with six strains of probiotics that work within hours, not days.

The addition of phages is designed to remove unwanted bacteria in the intestines to make room for the beneficial probiotics.

The suggested daily serving of one liquid vegetarian capsule of FLORASSIST® GI with Phage Technology provides:

**Probiotic Blend** • 15 Billion CFU**
- Lactobacillus acidophilus La-14
- Bifidobacterium lactis BL-04
- L. paracasei Lpc-37

**TetraPhage Blend** • 15 mg **
- LH01 - Myoviridae
- LL5 - Siphoviridae
- T4D - Myoviridae
- LL12 - Myoviridae

The probiotic blend in this formula is identical to the popular Florassist Balance. This new formula adds phages that promote the ability of beneficial bacteria to propagate.

FLORASSIST® GI with Phage Technology • Item #02125
30 liquid vegetarian capsules

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To order FLORASSIST® GI with Phage Technology, call 1-800-544-4440 or visit www.LifeExtension.com

Non-GMO  † Colony Forming Units at time of manufacture.  ** Daily Value not established.

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.
MAXIMIZE YOUR
OMEGA-3
BENEFITS

Super Omega-3 with Olive Extract, Krill & Astaxanthin is a unique combination of high-potency omega-3s from ultra-pure fish oil, concentrated olive polyphenols and the unique benefits of marine astaxanthin and krill.

Super Omega-3 with Olive Extract, Krill & Astaxanthin
Item #01988 • 120 softgels • Non-GMO

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Contains crustacean shellfish (krill).

To order Super Omega-3 with Olive Extract, Krill & Astaxanthin, 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.
Researchers continue to discover a wide variety of health benefits provided by berries.

Berries contain bioactive natural pigments called **anthocyanins**.

Used for thousands of years in traditional medicine, these water-soluble plant pigments are what give plants their wide range of colors, from blue and purple, to red and orange.

Anthocyanins have a broad spectrum of biological effects, exerting **antimicrobial**, **cell-protective**, **antitumor**, **lipid-lowering**, and **neuroprotective** properties—all of which have implications for disease prevention and promotion of good health. Despite these impressive benefits, the therapeutic opportunities for using anthocyanins have been largely overlooked.

Three new studies provide further insight on the potential of anthocyanins to help reduce risks of type II diabetes, cardiovascular disease, and neurodegeneration.
Anthocyanins Lower Risk for Chronic Disease

A large proportion of deaths in the modern world are caused by type II diabetes, cardiovascular disease, and neurodegenerative disorders (such as Alzheimer’s and Parkinson’s).

Studies have linked the rising incidence of these conditions in large part to our access to excess calories, which disrupts natural protective processes and causes us to gain weight, increases chronic levels of inflammation, and contributes to cellular aging. Three new studies on anthocyanins are of particular interest to those afflicted by these degenerative illnesses.

One of these was a large meta-analysis showing that anthocyanin intake was linked to a reduced risk of type II diabetes. (A meta-analysis provides statistical power because it condenses data from smaller studies, and then analyzes the larger group as a whole.) This study involved a total of nearly 400,000 participants in which anthocyanin intake was recorded. It found that subjects with the highest anthocyanin intake were at a significant 15% reduced risk for developing type II diabetes.

Just preventing type II diabetes alone could save nearly 250,000 lives a year, deaths caused largely from the cardiovascular and neurological consequences that occur as a result of the condition. But there’s evidence that anthocyanins can directly reduce risks for those conditions as well, as we’ll now see.

Cardiovascular Disease

Regular intake of anthocyanins is already known to reduce the risk for cardiovascular disease in women. Based on this knowledge, researchers at the Harvard School of Public Health set out to determine if anthocyanin intake would provide similar protection to men. To determine this, they followed 43,880 healthy men with no prior history of cardiovascular disease or cancer for 24 years in the Health Professionals Follow-Up Study.

During that time, 4,046 men (9.22%) had a myocardial infarction (heart attack).

Men with the highest anthocyanin intake experienced a 14% reduced risk of having a nonfatal heart attack. Among the subgroup of men with normal blood pressure at the beginning of the study, that protective effect rose to 19%. These figures suggest that increased anthocyanin intake could prevent nearly one in five men from having a nonfatal heart attack. This is a remarkable finding, especially considering that about 735,000 people in the US have heart attacks every year.

The researchers believe that the ability of anthocyanins to reduce cardiovascular risk might arise from the combination of reduced blood pressure, improved endothelial (blood vessel lining) function, and increased insulin sensitivity.

This brings us to the third impressive study published in 2016, one that showed the ability of anthocyanin supplementation to reduce the risk of neurodegeneration.

Neurodegeneration

Neurodegeneration is the gradual loss of brain cells, along with the loss of body function, as seen in Alzheimer’s, Parkinson’s, and other age-related dementias. It is closely associated with poor insulin sensitivity, diminished endothelial function, and elevated blood pressure. These facts suggested to alert scientists that anthocyanins might be useful in reducing the risk of neurodegeneration, perhaps by reducing the impact of at least those three factors.

To evaluate this theory, the researchers injected a group of mice with a substance known to
produce inflammatory and neurodegenerative changes in the brain similar to those seen in Alzheimer’s and related disorders. Beginning seven days before exposure to the inflammation-generating injection, one group of mice received an injection of anthocyanins, while another group was left untreated. The animals treated with anthocyanins showed significantly fewer effects in their brains compared with control mice.

For example, supplemented animals had reduced levels of oxidative stress. They also had significant reductions in brain inflammation, which was shown to be directly related to the inhibition of a host of pro-inflammatory factors including IL-1beta, TNF-alpha, and NF-kappaB.

Furthermore, the anthocyanin-treated animals showed fewer activated brain inflammation-generating cells.

This study shows us that supplementation with anthocyanins could prevent the kinds of brain changes associated with Alzheimer’s and Parkinson’s disease.

### How Do Anthocyanins Exert Their Protective Effects?

These recent studies demonstrate the protective effects of high anthocyanin intake against major chronic, age-related diseases. But how do they work?

Researchers are still seeking to clarify the precise mechanisms, but so far we have some good general ideas. For example, in type II diabetes, studies show that anthocyanins:

- Improve insulin sensitivity
- Increase the activity of a group of transcription factors that regulate the expression of certain genes called PPARs, which triggers increased utilization of sugars and fats, and prevents their storage or rising levels in blood
- Increase secretion of the antiobesity hormone adiponectin

Finally, in neurological disorders, anthocyanins:

- Protect neurons from the damaging effects of the toxic Alzheimer’s protein known as beta-amyloid
- Protect brain mitochondria from oxidative stress, keeping them alive to do their essential energy-producing work in the brain
- Prevent oxidative stress-induced brain cell death (apoptosis)
- Reduce the impact of excitotoxicity, the hyperactivity of certain brain neurotransmitters that is associated with development of Alzheimer’s disease
Anthocyanins have tremendous potential to reduce misery and disease. The primary dietary sources of anthocyanins are dark fruits, especially berries.\(^\text{1,35-38}\)

Even if Americans increase their consumption of cherries, strawberries, blackberries, blueberries, and others, few will be able to do it consistently enough to substantially impact healthy aging. There is also an issue with the amount of fructose ingested if they intentionally eat lots of berries.

Fortunately, anthocyanin extracts can achieve similar benefits to berries themselves. Interestingly, because these highly concentrated anthocyanin extracts are inherently stable; they cost less when taken as supplements compared to buying fresh fruits that spoil rapidly.

While berries are excellent sources of anthocyanins, it can be difficult to sustain daily high intakes of these nutrients through consumption of fresh berries alone. Anthocyanin supplements can provide protection that is available day in and day out.

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


PROSTATE HEALTH

The best way to keep You in the picture.

As a man ages, maintaining a healthy prostate is key. We created Ultra Natural Prostate to help you maintain prostate health, so you can focus on what’s important. With over a dozen natural ingredients, this supplement promotes healthy prostate function, supports easier urination, inhibits inflammatory factors, and encourages natural division of prostate cells. Ultra Natural Prostate. The most comprehensive prostate health supplement.

Call 1-800-544-4440 toll-free • 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.
Unlock the Health Benefits of BERRIES

**Polyphenols** contained in berries are the focus of intense research into brain health. Obtaining berries from food sources can be expensive, but standardized berry extracts are remarkably cost effective. Here are two berry extracts used by Life Extension® consumers:

**Blueberry Extract** contains three different sources of blueberry in each 500 mg capsule, providing a broad-spectrum of active polyphenols. The suggested supplemental dose for most individuals is one capsule daily.

**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.

### Blueberry Extract

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### Enhanced Berry Complete with Acai

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To order Blueberry Extract or Enhanced Berry Complete with Acai, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

AuroraBlue® is a registered trademark of Denali BioTechnologies, Inc. AnthoComplete™ and VitaBerry® are trademarks of VDF Futureceuticals, Inc., used under license. POMELLA® Extract is covered under U.S. Patent 7,638,640 and POMELLA® is a registered trademark of Verdure Sciences, Inc.

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.
Sage, a culinary herb, originated in the Mediterranean and is related to the mint family. It can be added to almost any dish as well as to smoothies, or drunk as a tea, and is known for a wide range of beneficial health effects.

**Diabetes**
Sage has been shown to lower blood glucose levels.1

**Skin Care**
Sclareol, a compound that is derived from sage and used as a scent oil, has been found to reduce skin wrinkles when used topically in a cream.2

**Memory**
Studies have shown the efficacy of sage for improving memory,3 as well as combating cognitive impairment in people both with and without dementia.4

**Upset Stomach**
Taken as an herbal tea, sage can soothe stomach distress and indigestion.5

**Sore throat**
Gargling with sage can provide relief from sore throat.5 To make a liquid mouthwash, add about a half-teaspoon of dried sage leaves to a half cup of water, boil it, let it cool and strain out the leaves.

References
The secrets, lies, and outright fraud uncovered by award-winning journalist Larry Olmsted in his book Real Food/Fake Food are downright shocking. “We absolutely should be alarmed by the latest food scandal, but we should not be surprised,” he says.

“We have incompetent FDA oversight. We have criminal, negligent or immoral producers of wine, cheese, oil, meat, and more. But the real scandal here is that many of us have never actually tasted the real things.”

The inspiration for Olmsted's book can be traced back to a visit he took to Japan years ago, during which he sampled that country’s world-renowned Kobe beef, with which he was much impressed with.

After returning to the US, he found that the so-called Kobe beef available here was dramatically inferior to what he’d enjoyed in Japan. A little research quickly uncovered the reason for the difference—the US Department of Agriculture (USDA) had banned the import of Kobe beef years earlier. Clearly, all of the “Kobe beef” sold in America was not what it was purported to be. Olmsted began to wonder how many other foods sold in the US might be fake. In the course of writing and researching his book, he found that “the unfortunate answer is a lot.”
**LE:** What exactly do you mean when you label much of the food in the US as “fake?”

**LO:** When I say fake, I mean fake, as in not what you think you are buying or eating... I’m talking about a massive industry of bait and switch, where you get something other than promised. I don’t like industrially produced supermarket beef, but it is in fact beef, and lives up to that billing. But when the same drug-laden, artificially fed beef is passed off as “natural,” “grass fed,” or “pure,” then it becomes fake—it is no longer what it claims to be.

**LE:** You write that many people spend hundreds of dollars on a single steak that is sold to them as Kobe beef when it isn’t. How can the government allow that kind of fraud to go unchecked?

**LO:** As a matter of policy, the US Food and Drug Administration (FDA) does not police most food fraud, and it hardly matters because most Kobe scams occur at restaurants, which are largely exempt from labeling laws. So they almost always get away with it.

**LE:** Are there other types of food that are as fraudulent?

**LO:** The seafood industry is far worse than beef, so rife with fakery, both legal and illegal, that it boggles the mind. Suffice it to say, if you think you are buying or eating red snapper—ever—you might want to think again. Several recent studies put the chances of your getting the white tuna you ordered in the typical New York sushi restaurant at zero—as in never. Wild-caught salmon? Wild-caught anything? Maybe not... It’s easy to take a “so what?” attitude when you order one kind of fish and get another, until you consider that the fake is likely pumped full of drugs and antibiotics—sometimes banned and illegal—none of which would have been in the fish you actually ordered. Not all fake foods are harmless, and many are disgusting.

**LE:** In your book, you go into quite a bit of detail discussing olive oil.

**LO:** Real extra-virgin olive oil is just about the healthiest fat on the market, yet most bottles sold in this country are fake. The imposters have often been stripped of their health benefits—and some might not even be made from olives. This is one of the most pervasive fake foods in America, reaching deep into home kitchens, restaurants, and supermarkets, and not unfamiliar to the government agencies supposedly watching over the food supply.

**LE:** Is there a noticeable difference between the taste of fake olive oil and the real thing?

**LO:** When I tasted oil in Puglia (at an artisanal olive farm in Italy), it left a warm tickle in the back of my throat, a sensation I would later learn is called olive sting. It is an indicator of freshness—and largely absent in oils sold in the United States. While it has become ubiquitous for American restaurants to stuff patrons with a basket of bread and a bowl of golden-colored oil for dipping, that liquid is so far removed from the real thing as to be unrecognizable.

**LE:** Besides taste, what is the public being deprived of when they consume fake or inferior olive oil?

**LO:** Real olive oil is low in saturated fat and high in monounsaturated fatty acids that reduce the risk of heart disease. Unlike vegetable oils, such as canola, olive oil also has additional beneficial properties, such as antioxidants and polyphenols, anti-inflammatory compounds that promote a healthful cardiovascular system.
Author Interview

LE: Olive oil has been the subject of a large number of studies over the years. Can you expand on what those studies have discovered?

LO: Reputable claims include fighting some forms of cancer, assisting in the assimilating of vitamins, fostering good digestion, and lowering blood cholesterol. It is higher in oleic acid than any vegetable oil, and this monounsaturated acid helps reduce the risk of cardiovascular disease (oleic acid is found in the highest concentrations in real extra virgin).

Extra virgin olive oil also contains sterols and the liposoluble vitamins A, D, and E, to which have been attributed a protective and antioxidant action that may prevent artery-blocking deposits and cancer and slow the aging process. Antioxidants, including polyphenols, are also believed to act as antitumoral agents. A more recently isolated substance in olive oil, dubbed oleocanthal, was shown to reduce the adverse effects of amyloid-beta-derived diffusible ligands, suspected of contributing to Alzheimer’s disease... Unfortunately, most of the health benefits disappear in fake olive oil.

LE: How pervasive is fake olive oil?

LO: In 2010, the University of California-Davis Olive Center tested supermarket samples and concluded that more than two-thirds of imported oils (69%) labeled “extra virgin” were not.

LE: What exactly did they conclude?

LO: “These failed samples had defective flavors such as rancid, dusty and musty... Chemical testing indicated that the samples failed extra virgin standards for reasons that include adulteration with cheaper oils; poor quality oil made from damaged and overripe olives, processing flaws, and/or improper oil storage.”

LE: What should consumers who want to get the real thing look for when purchasing olive oil?

LO: The most important thing you can find is the harvest date... Ignore meaningless “best by” or “bottled on” dates. “Extra virgin” is no guarantee, but its absence on a bottle is a guarantee of inferiority. Don't ever buy anything labeled “virgin,” “pure,” “light,” “extra light,” “olive oil blend,” Mediterranean blend,” or simply, “olive oil.”

LE: You write that authentic, original Parmesan cheese—Parmigiano-Reggiano—comes from a legally designated zone in Italy around the towns of Parma and Reggio. So what are we usually getting in the US?

LO: Most “Parmesan” cheese is a blatant counterfeiting of Parma's product, best exemplified by the ubiquitous Kraft grated version that comes in green cardboard tubes and tastes like what you would get if you ground up green cardboard tubes. This may not be as far from reality as it sounds. In early 2016, the FDA showed that Parmesan fraud has become a very serious problem for American...
consumers. Its tests showed that products described as “100% Parmesan” are routinely cut with cheaper products, and not just less expensive cheeses, but also wood pulp. Tests by Bloomberg News showed that Kraft Parmesan contained almost 4% cellulose, a plant-derived polymer mainly used to make paper and paperboard. Other brands had cellulose content as high as 7.8%.

**LE:** In general, what can consumers do to eat more real food and less fake food?

**LO:** The answer is twofold: shop better and cook more. You have more control over the final product if you make it than if you buy it made. In general, I suggest shopping at better stores, whether it is Whole Foods, Trader Joe’s, Costco, or the local fishmonger you trust. Cooking is the easiest solution to eating more real food at home. Despite the extra labor and time, in many cases doing it yourself pays off.

The single biggest shopping rule is to read ingredient labels carefully. The sheer number of components in heavily processed foods is a problem, as each can hide unsavory things, as well as where they came from. To me there is just something intrinsically wrong about eating a lot of unnecessary chemicals. It’s worth the time to cook real foods. It is also worth the effort to shop for them and worthwhile to support the real people who make them. Keep it real.

Larry Olmsted writes the “Great American Bites” column for USA Today and his food and travel column appears on Forbes.com. His expose on counterfeit Kobe beef for Forbes.com was widely covered by newspapers, websites, and radio shows around the world. Olmsted is the author of two books on golf and, most recently, Getting into Guinness, during the writing of which he set or broke three world records himself.

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

To order Real Food/Fake Food, call 1-800-544-4440 or visit www.LifeExtension.com

Item #34122
Retail price $27.95
Your price $20.96

“Olmsted makes me inversely hungry and craving real — a must read for anyone who cares deeply about the quality of our food and the health of our planet.”
—Steven Raichlen, author of the “BBQ Bible” series
California Estate Extra Virgin Olive Oil is American grown and lab-tested to be extremely high in polyphenols—over 600 mg per kg—as well as organic, authentic, and unadulterated.

This unfiltered extra virgin olive oil is:

- Cold-extracted at a small family farm in Yolo County, California, within hours of harvesting,
- Made entirely from green olives, handpicked to avoid bruising,
- Rich in distinctive and fruity flavor,
- Documented to have an exceptionally high content of potent polyphenols.

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To order California Estate Extra Virgin Olive Oil, call 1-800-544-4440 or visit www.LifeExtension.com
A properly functioning thyroid helps support:

- Energy Levels
- Motivation
- Concentration
- Metabolism and
- Healthy Weight Management

**Triple Action Thyroid** includes three all-natural herbs, **Ashwagandha**, **Guggul**, and **Korean Ginseng**, to provide comprehensive support by optimizing the thyroid hormones T3 and T4.\(^3\)

The addition of **vitamin B12**, **iodine**, **tyrosine**, and **vitamin A** further enhances its benefits.

Non-GMO

**References**

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

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

Optimize Thyroid Function with **Triple Action Thyroid**

**Feeling Fatigued and Forgetful?**

**Triple Action Thyroid**

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To order **Triple Action Thyroid**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)
Tremendous Value in One Softgel

HEALTH BOOSTER
Provides Important Nutrients Missing from Multivitamins

- **Alpha-carotene** and **saffron** to promote eye health.
- **Vitamin K2** is the active form that keeps calcium in bones and out of arteries.
- **Vitamin K1** is rapidly absorbed and partially converts to vitamin K2 in the body.
- **Zeaxanthin, lutein, and meso-zeaxanthin** to support healthy vision.
- **Sesame lignans** to boost gamma tocopherol activity.
- **Blueberry** extract to sustain healthy neurological function.
- **Alpha-carotene** and **saffron** to promote eye health.
- **Gamma tocopherols** to quench oxidation missed by conventional vitamin E.
- **Lycopene** to promote prostate health.
- **Chlorophyllin** to protect against environmental DNA damage.
- **Black currant extract** to promote eye health.
- **Methylcobalamin** form of B12 to better support healthy nerve function.
- **Vitamin K2** is the active form that keeps calcium in bones and out of arteries.
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- **Chlorophyllin** to protect against environmental DNA damage.
- **Black currant extract** to promote eye health.
- **Methylcobalamin** form of B12 to better support healthy nerve function.

**Once-Daily Health Booster**
Item #01991 • 60 softgels (two-month supply)

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The same nutrients sold separately would cost 2-3 times more money!

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

Non-GMO
Caution: Avoid use during pregnancy. Consult your healthcare practitioner before using this product if you are taking anti-coagulant or anti-platelet medications or have a bleeding disorder.

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

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Support longevity factors with one daily capsule:

- **Trans-Resveratrol** facilitates youthful gene expression.
- **Pterostilbene** facilitates youthful gene expression and activates longevity pathways.
- **Nicotinamide riboside** helps support physical performance (NIAGEN®).
- **Quercetin** inhibits inflammatory factors and augments the beneficial effects of resveratrol.
- **Fisetin**—switches on cell signaling molecules that support youthful expression of longevity genes.
- **Red Grape/Blueberry Blend** providing polyphenols, anthocyanins, OPCs.

**Optimized Resveratrol with Nicotinamide Riboside**

Item #02031 • 30 vegetarian capsules

<table>
<thead>
<tr>
<th></th>
<th>Retail Price</th>
<th>Super Sale Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bottle</td>
<td>$42</td>
<td>$28.35</td>
</tr>
<tr>
<td>4 bottles</td>
<td></td>
<td>$24.30 each</td>
</tr>
</tbody>
</table>

*Provides 250 mg of trans-resveratrol in one daily capsule along with synergistic plant extracts.

To order Optimized Resveratrol with Nicotinamide Riboside, call 1-800-544-4440 or visit www.LifeExtension.com

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


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.
SUPPORT ARTERIAL HEALTH

With The Most Complete Vitamin K Formula

Just one daily softgel of Super K formula provides:

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin K2 (MK-7)</td>
<td>200 mcg</td>
</tr>
<tr>
<td>Vitamin K2 (MK-4)</td>
<td>1,000 mcg</td>
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<tr>
<td>Vitamin K1</td>
<td>1,500 mcg</td>
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</table>

Super K with Advanced K2 Complex
Item #01834 • 90 softgels • Non GMO

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Retail Price</th>
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<tbody>
<tr>
<td>1 bottle</td>
<td>$30</td>
<td>$20.25</td>
</tr>
<tr>
<td>4 bottles</td>
<td>$80</td>
<td>$18.23 each</td>
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</tbody>
</table>

Each bottle lasts for three months.

To order Super K with Advanced K2 Complex or Once-Daily Health Booster, call 1-800-544-4440 or visit www.LifeExtension.com

Optimize your vitamin K and help keep calcium in your bones and out of blood vessels.

Vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7) can also be found in Life Extension® Once-Daily Health Booster (formerly Super Booster). If you take Once-Daily Health Booster, you do not need additional Super K with Advanced K2 formula.

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

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.
<table>
<thead>
<tr>
<th>PRODUCTS</th>
</tr>
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<tbody>
<tr>
<td><strong>Amino Acids</strong></td>
</tr>
<tr>
<td>Arginine/L-Ornithine Capsules</td>
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<tr>
<td>Arginine Ornithine Powder</td>
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<tr>
<td>Branched Chain Amino Acids</td>
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<tr>
<td>D,L-Phenylalanine Capsules</td>
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<tr>
<td>L-Ariginine Caps</td>
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<tr>
<td>L-Carnitine</td>
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<td>L-Glutamine</td>
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<td>L-Glutamine Powder</td>
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<tr>
<td>L-Lysine</td>
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<tr>
<td>L-Taurine Powder</td>
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<tr>
<td>L-Tyrosine Powder</td>
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<tr>
<td>Super Carnosine</td>
</tr>
<tr>
<td>Taurine</td>
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| **Blood Pressure & Vascular Support** |
| Advanced Olive Leaf Vascular Support with Celery Seed Extract |
| Arterial Protect |
| Blood Pressure Monitor Arm Cuff |
| Dual Action Blood Pressure |
| Endothelial Defense™ with Pomegranate Complete and CORDIART™ |
| Endothelial Defense™ with Glisodin® |
| Natural BP Management |
| NitroVasc with CORDIART™ |
| Pomegranate Complete |
| Pomegranate Fruit Extract |
| Triple Action Blood Pressure AM/PM |
| VenoFlow |

| **Bone Health** |
| Bone Restore |
| Bone Restore with Vitamin K2 |
| Bone Strength Formula with KoAct™ |
| Bone-Up™ |
| Calcium Citrate with Vitamin D |
| Dr. Strum’s Intensive Bone Formula |
| Stontum Caps |

| **Brain Health** |
| Acetyl-L-Carnitine |
| Acetyl-L-Carnitine Arginate |
| Blast™ |
| Brain Shield® Gastrodin |
| 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 |
| Prevagen™ |
| PS (Phosphatidylserine) Caps |
| Vincopetine |

| **Cholesterol Management** |
| Advanced Lipid Control |
| Cho-Less™ |
| CHOL-OL 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 |
| Esophagcool |
| Esophageal Guardian |

| **Extraordinary Enzymes** |
| Fem Dophilus |
| Fiber-Immune Support |
| Gastro-Ease |
| Ginger Force® |
| Organic Golden Flax Seed |
| Pancreatin |
| Regimint |
| Tranquil Tract™ |
| Trufiber™ |
| WellBetX PGX plus Mulberry |

| **Energy Management** |
| Adrenal Energy Formula |
| Asian Energy Boost |
| D-Ribose Powder |
| D-Ribose Tablets |
| Forskolin |
| Mitochondrial Basics with BioPQQ® |
| Mitochondrial Energy Optimizer with BioPQQ®|
| NAD+ Cell Regenerator™ |
| Peak ATP® with GlycoCarn® |
| PQO Caps with BioPQQ® |
| Rhodiola Extract |
| Ribogem™ French Oak Wood Extract |
| Triple Action Thyroid |

| **Eye Health** |
| Astaxanthin with Phospholipids |
| Brite Eyes IIL |
| 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® Proximal® 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® & Crominex® 3+ Mega Benfotamine |
| Natural Glucose Absorption Control Tri Sugar Shield® |

| **Heart Health** |
| Aspiron (Enteric Coated) |
| BioActive Folate & Vitamin B12 Caps |
| Cardio Peak™ with Standardized Hawthorn and Arjuna |
| Optimized Carnitine with GlycoCarn® |
| 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 |

| **Immune Support** |
| AHCC® Echinacea Extract |
| Enhanced Zinc Lozenges |
| Immune Modulator with TiOfeud™ |
| Immune Protect with PARACTIN™ |
| Immune Senescence Protection Formula™ |
| Kinoko® Gold AHCC |
| Kyolic® Garlic Formula 102 |
| Kyolic® Garlic Formula 106 |
| Kyolic® Reserve |
| Lactoferin (apolactoferin) 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® |
| Boswella |
| Cytokine Suppress™ with EGCG |
| Nerva® |
| Serraflozyme |
| Specially-Coated Bromelain |
| Super Bio-Curcumin® |
| Zylflamend® 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 |
| Krill 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-Acid with HepatoProtection Complex |
| Calcium D-Gluarate |
| Chlorella |
| Chlorophyllin |
| European Milk Thistle |
| Glutathione, Cysteine & C |
| HepatoPro |
| Liver Efficiency Formula |
| N-Acetyl-L-Cysteine |
| PectaSol-C™ |
| Silymarin |
| SODzyme® with Glisodin® & Wolfberry |

| **Longevity & Wellness** |
| 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
Mega Green Tea Extract (decaffeinated)
Mega Green Tea Extract (lightly decaffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Optimized Resveratrol with Nicotinamide Riboside
pTeroPure®
Pycnogenol® 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
Pome-T™
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

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

Miscellaneous
Solarshield® Sunglasses

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

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

Personal Care
Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor’s Advanced Hair Formula
Dr. Proctor’s Shampoo
European Leg Solution Featuring Certified Diosmin 95
Face Master Platinum
Facial Toning System
Hair, Skin & Nail Rejuvenation Formula w/VERISOL®
Hair Suppress Formula

Probiotics
Bifido GI Balance
BroccoMax®
FLORASSIST® Balance
FLORASSIST® GL with Phage Technology
FLORASSIST® Heart Health
FLORASSIST® Mood
FLORASSIST® Oral Hygiene
Theralac® Probiotics
TruFlora® Probiotics

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 (Chocolate and Vanilla Flavor)

Vitamins
Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
BioActive Complete B-Complex
Biotin
Buffered Vitamin C Powder
Fast C® with Dihydrolcoptin
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 Ascorbate C Capsules
Super Ascorbate C Powder
Super K with Advanced K2 Complex
Vitamin B12
Vitamin B6
Vitamin C with Dihydrolcoptin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

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

Women’s Health
Advanced Natural Sex for Women® 50+
Breast Health Formula
Femmenessence MacaPause®
Natural Estrogen
Progesta-Care®
Super-Absorbable Soy Isoflavones
Ultra Soy Extract
<table>
<thead>
<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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<td>ACETYL-L-CARNITINE - 500 mg, 100 veg. caps</td>
<td>34.00</td>
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<td>ANTI-ALCOHOL w/HEPATOPRO COMPLEX - 60 caps</td>
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<td>APPLEWISE POLYPHENOL EXTRACT - 600 mg, 30 veg. caps</td>
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<td>ARGININE/ORNITHINE - 500/250, 100 caps</td>
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<td>00038</td>
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<td>ARTERIAL PROTECT - 30 veg. caps</td>
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<td>01817</td>
<td>ARTHROMAX® W/TEAFLAVINS &amp; APRÉSFLEX® - 120 veg. caps</td>
<td>44.00</td>
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<td>ARTHROMAX® ADVANCED W/UC-II® &amp; APRÉSFLEX® - 60 caps</td>
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<td>ASHWAGANDHA EXTRACT (Optimized) - 60 caps</td>
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<td>ASIAN ENERGY BOOST - 90 veg. caps</td>
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<tr>
<td>01066</td>
<td>ASPIRIN® - 81 mg, 30 enteric coated tablets</td>
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<td>01823</td>
<td>ASTAXANTHIN WITH PHOSPHOLIPIDS - 4 mg, 30 softgels</td>
<td>16.00</td>
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<td>00902</td>
<td>BENEFOTIAMINE W/THIAMINE - 100 mg, 120 veg. caps</td>
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<td>00925</td>
<td>BENEFOTIAMINE (Mega) - 250 mg, 120 veg. caps</td>
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<tr>
<td>01206</td>
<td>BERRY COMPLETE - 30 veg. caps</td>
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<td>BERRY COMPLETE W/ACAI (Enhanced) - 60 caps</td>
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<td>BETA-CAROTENE - 25,000 IU, 100 softgels</td>
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<td>01622</td>
<td>BIFIDO GI BALANCE - 60 veg. caps</td>
<td>20.00</td>
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<td>01873</td>
<td>BILBERRY EXTRACT - 100 mg, 90 veg. caps</td>
<td>36.00</td>
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<td>BIOACTIVE MILK PEPTIDES - 30 caps</td>
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<td>BIO-COLLAGEN W/PATENTED UC-II® - 40 mg, 60 small caps</td>
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<td>BIOSIL® - 5 mg, 30 veg. caps</td>
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<td>00102</td>
<td>Biotin - 600 mcg, 100 caps</td>
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<td>BLACK CUMIN SEED OIL - 60 softgels</td>
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<td>01710</td>
<td>BLACK CUMIN SEED OIL W/BIO-CURCUMIN® - 60 softgels</td>
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<td>01008</td>
<td>BLAST® - 600 grams of powder</td>
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<td>BLOOD PRESSURE (Dual Action) - 60 veg. tabs</td>
<td>44.00</td>
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<td>28.00</td>
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**SUPER SALE SAVINGS ON ALL PRODUCTS**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

**SUBTOTAL OF COLUMN 1**

**SUBTOTAL OF COLUMN 2**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL 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>GTY Total</th>
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<td>01659</td>
<td>Cognizin® CD P choline caps  • 250 mg, 60 veg. caps</td>
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<td>01945</td>
<td>Complete B-Complex (BioActive)  • 60 veg. caps</td>
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<tr>
<td>02098</td>
<td>Comprehensive Nutrient Packs Advanced  • 30 packs</td>
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<td>01949</td>
<td>CoQ10 w/4-Limonene (Super-Absorbable)  • 50 mg, 100 softgels</td>
<td>25.00</td>
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<tr>
<td>01948</td>
<td>CoQ10 w/4-Limonene (Super-Absorbable)  • 100 mg, 100 softgels</td>
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<td>28.00</td>
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<tr>
<td>01829</td>
<td>CoQ10 (Super Ubiquinol)  • 100 mg, 60 softgels</td>
<td>56.00</td>
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<td>CoQ10 w/Biopo® (Super Ubiquinol)  • 100 mg, 30 softgels</td>
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<td>01426</td>
<td>CoQ10 w/ENH Mitochondrial Support™ (Super Ubiquinol)  • 100 mg, 60 softgels</td>
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<td>01425</td>
<td>CoQ10 w/ENH Mitochondrial Support™ (Super Ubiquinol)  • 50 mg, 100 softgels</td>
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<td>CoQ10 w/ENH Mitochondrial Support™ (Super Ubiquinol)  • 200 mg, 30 softgels</td>
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<td>CoQ10 w/ENH Mitochondrial Support™ (Super Ubiquinol)  • 200 mg, 30 softgels</td>
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<tr>
<td>00862</td>
<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>01529</td>
<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 mimetic longevity formula  • 60 veg. caps</td>
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<td>00407</td>
<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 Suppressor™ w/escg  • 30 veg. caps</td>
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<td>80157</td>
<td>Advanced Anti-Glycation Peptide Serum  • 1 oz</td>
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<td>80154</td>
<td>Advanced Lightening Cream  • 1 oz</td>
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<td>Advanced Peptide Hand Therapy  • 4 oz</td>
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<td>80152</td>
<td>Advanced Triple Peptide Serum  • 1 oz</td>
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<td>80140</td>
<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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<tr>
<td>80158</td>
<td>Anti-Aging Face Oil  • 1 oz</td>
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<td>80118</td>
<td>Anti-Aging Mask  • 2 oz</td>
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<td>80151</td>
<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>80127</td>
<td>Antioxidant Rejuvenating Foot Cream  • 2 oz</td>
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<td>Antioxidant Rejuvenating Hand Cream  • 2 oz</td>
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<td>80105</td>
<td>Anti-Redness &amp; Adult Blemish Lotion  • 1 oz</td>
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<td>80147</td>
<td>Bioflavonoid Cream  • 1 oz</td>
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<td>80144</td>
<td>Broccoli Sprout Cream  • 1 oz</td>
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<td>Collagen Boosting Peptide Serum  • 1 oz</td>
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<td>80120</td>
<td>Corrective Clearing Mask  • 2 oz</td>
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<td>80141</td>
<td>DNA Repair Cream  • 1 oz</td>
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<td>80108</td>
<td>Essential Plant LIPIDS Reparative Serum  • 1 oz</td>
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<td>56.21</td>
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**Subtotal of Column 3**

**Subtotal of Column 4**
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<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>02021</td>
<td>DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps</td>
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<tr>
<td>02022</td>
<td>DIGESTIVE ENZYMES w/PROBIOTICS (Enhanced Super) • 60 veg. caps</td>
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<tr>
<td>01671</td>
<td>D. L-PHENYLALANINE • 500 mg, 100 veg. caps</td>
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<tr>
<td>01540</td>
<td>DMAE BITARTRATE • 150 mg, 200 veg. caps</td>
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<tr>
<td>01570</td>
<td>DNA PROTECTION FORMULA • 60 veg. caps</td>
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<tr>
<td>01931</td>
<td>DOG MIX • 100 grams powder</td>
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<tr>
<td>02006</td>
<td>DOPA-MIND™ • 60 veg. caps</td>
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<tr>
<td>00321</td>
<td>DR. PROCTOR’S ADVANCED HAIR FORMULA • 2 oz</td>
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<tr>
<td>00320</td>
<td>DR. PROCTOR’S HAIR SHAMPOO • 8 oz</td>
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</tbody>
</table>

**Super Sale Savings on All Products**

Deduct an additional 10% on all products during super sale.
<table>
<thead>
<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 Total</th>
<th>YOUR PRICE</th>
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<td>01902</td>
<td>MACUGUARD® OCULAR SUPPORT • 60 softgels</td>
<td>25.00</td>
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<td>MACUGUARD® OCULAR SUPPORT w/ASTAXANTHIN 60 softgels</td>
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<td>30.00</td>
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<td>01459</td>
<td>MAGNESIUM CAPS • 500 mg, 100 veg. caps</td>
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<td>01682</td>
<td>MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps</td>
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<td>02107</td>
<td>(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps</td>
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<td>13.50</td>
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<tr>
<td>01668</td>
<td>MELATONIN • 300 mcg, 100 veg. caps</td>
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<td>MELATONIN • 1 mg, 60 caps</td>
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<td>MELATONIN • 3 mg, 60 veg. caps</td>
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<td>MELATONIN • 10 mg, 60 veg. caps</td>
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<td>MELATONIN • 3 mg, 60 veg. lozenges</td>
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<td>MELATONIN (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)</td>
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<td>MELATONIN TIMED RELEASE • 300 mcg, 100 veg. tabs</td>
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<td>MELATONIN TIMED RELEASE • 750 mcg, 60 veg. tablets</td>
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<td>MEMORY PROTECT • 36 day supply</td>
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<td>METHYLCOBALAMIN • 1 mg, 60 veg. lozenges (vanilla)</td>
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<td>MIGRA-EZZE™ (Butterbur) • 60 softgels</td>
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<td>MILK THISTLE (European) • 60 softgels</td>
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<td>MILK THISTLE (European) • 120 softgels</td>
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<td>01940</td>
<td>MIRAFORTE w/STANDARDIZED LIGNANS (Super) • 120 veg caps</td>
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<td>MITOCHONDRIAL BASICS W/BIOQQ® • 30 caps</td>
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<td>00665</td>
<td>MK-7 • 90 mcg, 60 softgels</td>
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<td>00541</td>
<td>MSM (Methylsulfonylmethane) • 1,000 mg, 100 caps</td>
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**SUBTOTAL OF COLUMN 7**

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<th>YOUR PRICE</th>
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<td>NATURAL SLEEP® MELATONIN • 5 mg, 60 veg. caps</td>
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<td>03071</td>
<td>NERVIA® • 90 softgels</td>
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<td>01602</td>
<td>NEURO-MAG® MAGNESIUM L-THREONATE w/CALCIUM &amp; VITAMIN D3 • 25 grams • Lemon flavor</td>
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<td>01990</td>
<td>NITROVASC w/ORDIART™ • 30 veg. caps</td>
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**SUBTOTAL OF COLUMN 8**

OFFER ENDS JANUARY 31, 2017
### ITEM No. | PRODUCT | Retail Each | 1 Unit Each | 4 Unit Each | 10 Unit Each | QTY Total |
--- | --- | --- | --- | --- | --- | --- |
01441 | PROGESTA-CARE* • 4 oz cream | 36.39 | 27.29 | 25.72 | 24.00 | 25.72 |
01926 | PROSTATE FORMULA (Ultra NAT) • 60 softgels | 38.00 | 28.50 | 26.25 | 24.00 | 26.25 |
01909 | PROSTAPOLLEN® (Triple strength) • 30 softgels | 28.00 | 21.00 | 18.75 | 17.50 | 18.75 |
01742 | PROTEIN-ISOLATE (Whey) Vanilla • 403 grams | 30.00 | 22.50 | 19.50 | 17.00 | 19.50 |
01743 | PROTEIN-ISOLATE (Whey) Chocolate • 437 grams | 30.00 | 22.50 | 19.50 | 17.00 | 19.50 |
01770 | PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 500 grams | 30.00 | 22.50 | 19.50 | 17.00 | 19.50 |
01771 | PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 640 grams | 30.00 | 22.50 | 19.50 | 17.00 | 19.50 |
01812 | PROVINAL® PURIFIED OMEGA-7 • 30 softgels | 27.00 | 20.25 | 18.00 | 15.75 | 18.00 |
01676 | PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps | 54.00 | 40.50 | 36.00 | 31.50 | 36.00 |
01508 | PTEROPURE® Pterostilbene • 50 mg, 60 veg. caps | 32.00 | 24.00 | 22.50 | 19.60 | 22.50 |
01209 | PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps | 20.00 | 15.00 | 13.50 | 11.75 | 13.50 |
01637 | PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps | 64.00 | 48.00 | 45.00 | 37.50 | 45.00 |
02127 | PYRIDOXAL 5'-PHOSPHATE • 100 mg, 60 veg. caps | 22.00 | 16.50 | 14.85 | 12.60 | 14.85 |

### ITEM No. | PRODUCT | Retail Each | 1 Unit Each | 4 Unit Each | 10 Unit Each | QTY Total |
--- | --- | --- | --- | --- | --- | --- |
01309 | QUERCETIN (Optimized) • 250 mg, 60 veg. caps | 22.00 | 16.50 | 15.00 | 13.75 | 15.00 |
01030 | RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps | 17.60 | 13.20 | 11.92 | 10.20 | 13.20 |
00605 | REGIMINT • 60 enteric-coated caps | 19.95 | 14.96 | 14.00 | 12.30 | 14.00 |
01708 | REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps | 30.00 | 22.50 | 20.25 | 18.00 | 20.25 |
01448 | REJUVENEX® BODY LOTION • 6 oz | 24.00 | 18.00 | 16.80 | 14.80 | 16.80 |
01621 | REJUVENEX® FACTOR FIRMING SERUM • 1.7 oz | 65.00 | 48.75 | 45.75 | 39.60 | 45.75 |
01220 | REJUVENEX® (Ultra) • 2 oz | 52.00 | 39.00 | 33.00 | 28.50 | 33.00 |
00676 | REJUVENIGHT® (Ultra) • 2 oz | 39.95 | 29.96 | 26.52 | 22.90 | 26.52 |
01410 | RESVERATROL W/PTEROSTILBENE • 100 mg, 60 veg. caps | 36.00 | 27.00 | 24.00 | 20.60 | 24.00 |
02031 | RESVERATROL W/NICOTINAMIDE RIBOSIDE (Optimized) • 30 veg. caps | 42.00 | 31.50 | 27.00 | 22.50 | 27.00 |
02030 | RESVERATROL (Optimized) • 60 veg. caps | 46.00 | 34.50 | 31.00 | 25.50 | 31.00 |
00898 | RHODIOILA EXTRACT • 250 mg, 60 veg. caps | 14.00 | 10.50 | 9.00 | 7.25 | 9.00 |
01900 | RIBOGEN® FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps | 36.00 | 27.00 | 24.75 | 20.40 | 24.75 |
00972 | (D) RIBOSE POWDER • 150 grams | 27.50 | 20.63 | 18.56 | 15.72 | 18.56 |
01473 | (D) RIBOSE TABLETS • 100 veg. tabs | 32.00 | 24.00 | 21.00 | 17.60 | 21.00 |
01609 | RICH REWARDS® BREAKFAST GROUND COFFEE • 12 oz bag | 13.00 | 9.75 | 8.50 | 7.00 | 8.50 |
01730 | RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Mocha • 12 oz bag | 15.00 | 11.25 | 10.50 | 8.75 | 10.50 |
01729 | RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Vanilla • 12 oz bag | 15.00 | 11.25 | 10.50 | 8.75 | 10.50 |
01612 | RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE 12 oz bag | 13.00 | 9.75 | 8.50 | 7.00 | 8.50 |
01610 | RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE 12 oz bag | 14.00 | 10.50 | 9.30 | 7.50 | 9.30 |
01208 | R-LIPIC ACID (Super) • 240 mg, 60 veg. caps | 49.00 | 36.75 | 33.75 | 28.25 | 33.75 |
00570 | RNA CAPSULES • 500 mg, 100 caps | 17.95 | 13.46 | 12.12 | 9.88 | 12.12 |

### ITEM No. | PRODUCT | Retail Each | 1 Unit Each | 4 Unit Each | 10 Unit Each | QTY Total |
--- | --- | --- | --- | --- | --- | --- |
01432 | SAFFRON W/SATIEREAL® (Optimized) • 60 veg. caps | 36.00 | 27.00 | 24.00 | 20.00 | 24.00 |
01935 | SAMe (S-ADENOSYL-METHIONINE) • 500 mg, 30 enteric coated tablets | 25.00 | 18.75 | 16.50 | 13.25 | 16.50 |
01933 | SAMe (S-ADENOSYL-METHIONINE) • 400 mg, 30 enteric coated tablets | 26.00 | 19.50 | 17.00 | 14.00 | 17.00 |

---

**SUBTOTAL OF COLUMN 9**

**SUBTOTAL OF COLUMN 10**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

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

---

**TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 - TO ORDER ONLINE VISIT: www.LifeExtension.com**

---

**SUPER SALE SAVINGS ON ALL PRODUCTS**
## Item No. | PRODUCT | YOUR PRICE | TO ORDER CALL: 1-954.766.8433 or 1.800.544.4440 | TO ORDER ONLINE VISIT: www.LifeExtension.com

### **U, V**

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<th>Item No.</th>
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<th>RT</th>
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<td>Vanadyl Sulfate</td>
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<td>Venoflow</td>
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<td>2,000 IU, 1 fl. oz, Mint flavor</td>
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<td>Vitamin D3 W/Sea-Iodine™</td>
<td>5,000 IU, 60 caps</td>
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<td>00864</td>
<td>Vitamin D3 Liquid</td>
<td>2,000 IU, 1 fl. oz</td>
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<td>01640</td>
<td>Vitamin D and K W/Sea-Iodine™</td>
<td>60 caps</td>
<td>24.00</td>
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<td>Vitamin E (Natural)</td>
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<td>Vitamin K2 (Low dose)</td>
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### **X, Y**

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<td>00409</td>
<td>Xylitolwhite™ Mouthwash</td>
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<td>Zinc High Potency</td>
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### **Books**

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<td>33999</td>
<td>The Menopause Cure</td>
<td>978-1-936768-47-9</td>
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<td>33840</td>
<td>The Crway® to Great Glucose Control CD</td>
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## Subtotal of Column 11

**Books:**

- 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 customers outside of Canada.***
- † Due to license restrictions, this product is not for sale to customers outside of the USA and Canada.

## Subtotal of Column 12

**Deduct an additional 10% on all products during Super Sale**
**ORDER SUBTOTALS**

| SUBTOTAL COLUMN 1 |  |
| SUBTOTAL COLUMN 2 |  |
| SUBTOTAL COLUMN 3 |  |
| SUBTOTAL COLUMN 4 |  |
| SUBTOTAL COLUMN 5 |  |
| SUBTOTAL COLUMN 6 |  |
| SUBTOTAL COLUMN 7 |  |
| SUBTOTAL COLUMN 8 |  |
| SUBTOTAL COLUMN 9 |  |
| SUBTOTAL COLUMN 10 |  |
| SUBTOTAL COLUMN 11 |  |
| SUBTOTAL COLUMN 12 |  |

**ORDER TOTALS**

| SUPER SALE DEDUCT 10% (Subtotal X 10%) |
| POSTAGE & HANDLING | $5.50 |
| C.O.D. s (ADD $7 FOR C.O.D. ORDERS) |

**GRAND TOTAL** (MUST BE IN U.S. DOLLARS)

---

**BILL TO ADDRESS**

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

**SHIP TO ADDRESS**

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

---

**PREMIER**

Order Over $50?

Get a year of unlimited **FREE shipping** and **double rewards** for only $0.

There’s no catch: just apply your instant $50 bonus at checkout. Your orders ship free for 12 months, you earn double (4%) rewards back all year long, and the cost of enrollment is offset by your instant bonus.* This makes Premier the only rewards program that more than pays for itself!

**Premier. Simply. More.**

Just $49.95 | $59.95 for international customers

Call 1-888-224-8239 to enroll

Visit [www.LifeExtension.com/Premier](http://www.LifeExtension.com/Premier) for details • Mention code YRX618D

---

*Certain restrictions apply. For complete terms and conditions please visit [www.LifeExtension.com/Premier](http://www.LifeExtension.com/Premier)

---

Prices subject to change without notice. Please notify Life Extension of any address change.
AMPK Promotes Longevity Factors

Importance of AMPK
Studies show increased AMPK activity supports:

- Reduced fat storage,¹
- New mitochondria production,²
- The promotion of healthy blood glucose and lipids already within normal range.³

AMPK Activator provides nutrients shown to significantly boost AMPK activity.

Gynostemma Pentaphyllum
In one study, researchers documented a 1-inch reduction in abdominal circumference in overweight individuals who took 450 mg daily of G. pentaphyllum extract for 12 weeks.⁴

Trans-Tiliroside
Trans-tiliroside promotes healthy blood glucose levels and body weight already within normal range.⁵

AMPK Activator
Item #01907 • 90 vegetarian capsules

<table>
<thead>
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<td>1 bottle</td>
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Non-GMO
ActivAMP® is a registered trademark of Gencor.
This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results are not guaranteed and results may vary.

References

To order AMPK Activator, 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.
87 BERRIES LOWER DISEASE RISK
Three new studies have shown that berries, rich in beneficial anthocyanins, can help prevent neurodegeneration, heart disease, and diabetes.

74 COMBAT HIGH URIC ACID
More than 20% of Americans have excess uric acid levels, increasing their risk of painful gout. A tree fruit extract can safely inhibit uric acid production without the use of side effect-prone medications.

50 HEARTBURN RELIEF WITHOUT DRUGS
About 40% of adult Americans suffer from heartburn, usually treated by proton-pump inhibitor drugs like Nexium® and Prilosec®. A safer way has been developed to reduce acid reflux and heartburn symptoms.

28 PROTECT AGAINST WINTER Colds and FLU
Flu and pneumonia kill 55,000 people a year, especially those with weakened immune systems. Learn how to bolster immune defenses to help protect against winter illnesses.

62 SHIELD YOUR EYES FROM BLINDING BLUE LIGHT
Smart phones and computers emit harmful blue light that can lead to blindness. The nutrients lutein, zeaxanthin and meso-zeaxanthin can guard your retina against electronic-screen emitting blue light.

7 HIDDEN FACTOR BEHIND KIDNEY DISEASE EPIDEMIC
Scientists at Johns Hopkins University warn that common heartburn drugs can increase the risk of kidney disease by almost 50%. Higher rates of bone fracture, dementia and coronary artery disease are also associated with these heartburn drugs. Learn about natural alternatives.