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November 2016

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Arianna Huffington’s Successful Battle against Insomnia

November 2016

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For a complete list of ingredients, dosage and use, important cautions and references, go to www.LifeExtension.com.
# Life Extension® Magazine

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CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

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Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.

Ricardo Bernales, MD, is a board-certified pediatrician and general practitioner in Chicago, IL, focusing on allergies, bronchial asthma, and immunodeficiency.

Mark S. Bezek, MD, FACP, FAARM, FAAEM, is board-certified in internal medicine, emergency medicine, and anti-aging/regenerative medicine. He is the director of Med-Link Consulting, which specializes in bioidentical hormone replacement therapy, natural alternatives, anti-aging, and degenerative diseases. He holds US patents for a multivitamin/mineral supplement, an Alzheimer’s/dementia compilation, and a diabetic regimen.

Anna M. Cabeca, DO, FACOG, ABAARM, is a board-certified gynecologist and obstetrician, as well as board-certified in anti-aging and regenerative medicine, an expert in functional medicine, and an expert in women’s health. She specializes in bioidentical hormone replacement therapy and natural alternatives, successful menopause and age-management medicine.

Thomas F. Crais, MD, FACS, is a board-certified plastic surgeon, was medical director of the microsurgical research and training lab at Southern Baptist Hospital in New Orleans, LA, and currently practices in Sun Valley, ID.

William Davis, MD, is a preventive cardiologist and author of Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health. He is also medical director of the online heart disease prevention and reversal program, Track Your Plaque (www.trackyourplaque.com).

Martin Dayton, MD, DO, practices at the Sunny Isles Medical Center in North Miami Beach, FL. His focus is on nutrition, aging, chelation therapy, holistic medicine, and oxidative medicine.

John DeLuca, MD, DC, is a 2005 graduate of St. George’s University School of Medicine. He completed his internal medicine residency at Monmouth Medical Center in Long Branch, NJ, in 2008 and is board-certified by the American Board of Internal Medicine. Dr. DeLuca is a Diplomate of the American Academy of Anti-Aging Medicine and has obtained certifications in hyperbaric medicine, pain management, nutrition, strength and conditioning, and manipulation under anesthesia.

Gary Goldfaden, MD, is a clinical dermatologist and a lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology of Hollywood, FL, and COSMESIS Skin Care.

Miguelangelo Gonzalez, MD, is a certified plastic and reconstructive surgeon at the Miguelangelo Plastic Surgery Clinic, Cabo San Lucas.

Garry F. Gordon, MD, DO, is a Payson, AZ-based researcher of alternative approaches to medical problems that are unresponsive to traditional therapies. He is president of the International College of Advanced Longevity Medicine.

Richard Heifetz, MD, is a board-certified anesthesiologist in Santa Rosa, CA, specializing in the delivery of anesthesia for office-based plastic/cosmetic surgery, chelation therapy, and pain management.

Roberto Marasi, MD, is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management.

Maurice D. Marholin, DC, DO, is a licensed chiropractic physician and board-certified orthopedic family physician. While training at the University of Alabama, he completed Fellowships in Clinical Nutrition and Behavioral Medicine. He is currently in private practice in Clermont, FL.

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Philip Lee Miller, MD, is founder and medical director of the Los Gatos Longevity Institute in Los Gatos, CA.

Michele G. Morrow, DO, FAAFP, is a board-certified family physician who merged mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

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Carmen Fusco, MS, RN, CNS, is a research scientist and clinical nutritionist in New York City who has lectured and written numerous articles on the biochemical approach to the prevention of aging and degenerative diseases.

Norman R. Gay, MD, is proprietor of the Bahamas Anti-Aging Medical Institute in Nassau, Bahamas. A former member of the Bahaman Parliament, he served as Minister of Health and Minister of Youth and Sports.

Mitchell J. Ghen, DO, PhD, holds a doctorate in holistic health and anti-aging and serves on the faculty of medicine at the Benemerita Universidad Autonoma De Puebla, Mexico, as a professor of cellular hemapoetic studies.

Herbert Pardell, DO, FAAIM, practices internal medicine at the Emerald Hills Medical Center in Hollywood, FL. He is a medical director of the Life Extension Foundation®.

Ross Pelton, RPh, PhD, CCN, is director of nutrition and anti-aging research for Intramedicine, Inc.

Patrick Quillin, PhD, RD, CNS, is a clinical nutritionist in Carlsbad, CA, and formerly served as vice president of nutrition for Cancer Treatment Centers of America, where he was a consultant to the National Institutes of Health.

Allan Rashford, MD, graduated from the University of Iowa Medical School. Upon completing medical training, he became chief of medicine at St. Francis Hospital in South Carolina, and he was later named president of the Charleston Medical Society.

Marc R. Rose, MD, practices ophthalmology in Los Angeles, CA, and is president of the Rose Eye Medical Group. He is on the staff of Pacific Alliance Medical Center, Los Angeles, and other area hospitals.

Michael R. Rose, MD, a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staff of the University of Southern California and UCLA.

Ron Rothenberg, MD, is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego, CA.

Roman Rozencwaig, MD, is a pioneer in research on melatonin and aging. He practices in Montreal, Canada, as research associate at Montreal General Hospital, Department of Medicine, McGill University.

Michael D. Seidman, MD, FACS, is the director of otolaryngology-head and neck surgery for the Bloomfield satellite of Henry Ford Health System (HFHS), Detroit, MI, co-director of the Tinnitus Center, and co-chair of the Complementary/Alternative Medicine Initiative for HFHS.

Ronald L. Shuler, BS, DDS, CCN, LN, is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. He is board-certified in anti-aging medicine.

Paul Wand, MD, Fort Lauderdale, FL, is a clinical neurologist with special expertise in treating and reversing diabetic peripheral neuropathy and brain injuries from various causes.
**Scientific Advisory Board**

Örn Adalsteinsson, PhD, is chairman of the *Life Extension*® Scientific Advisory board. He holds a master’s and doctorate from the Massachusetts Institute of Technology (MIT). He has specialized in human therapeutics including vaccines, monoclonal antibodies, product development, nutraceuticals, formulations, artificial intelligence, hormones, and nutritional supplementation. He has also authored articles and contributed to peer-reviewed publications and served as an editor for the *Journal of Medicinal Food*.

John Boik, PhD, is the author of two books on cancer therapy, *Cancer and Natural Medicine* (1996) and *Natural Compounds in Cancer Therapy* (2001). He obtained his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University Department of Statistics. He is currently president of New Earth BioMed, a nonprofit cancer research corporation that studies mixtures of natural products.

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

Frank Eichhorn, MD, is a urologist specializing in prostate cancer for 10 years. He has a private practice in Bad Reichenhall, Germany, and is prostate cancer consultant at the Urologische Klinik Castringius, Planegg, Munich. In his integrative approach to prostate cancer he works together with an international network of experts to improve treatment outcomes for prostate cancer patients with a special focus on natural and translational medicine.

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

Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates in groundbreaking hypothermia, cryoablation, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.

Peter H. Langsjoen, MD, FACC, is a cardiologist specializing in congestive heart failure, primary and statin-induced diastolic dysfunction, and other heart diseases. A leading authority on coenzyme Q10, Dr. Langsjoen has been involved with its clinical application since 1983. He is a founding member of the executive committee of the International Coenzyme Q10 Association, a fellow of the American College of Cardiology, and a member of numerous other medical associations.

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

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

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of *The Great American Heart Hoax*, *The Complete Mediterranean Diet* and *Heart Attack Proof*. For more information visit www.drozner.com.

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

Xiaoxi Wei, PhD, is a chemist expert in supramolecular assembly and development of synthetic transmembrane nanoparticles with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded XTherma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.
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**Optimized Folate** provides metabolically active 5-MTHF folate in 1,000 mcg or 5,000 mcg strengths.

**Optimized Folate** (1,000 mcg)
Item #01939 • 100 vegetarian tablets

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

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A lot of people ask how Life Extension® is able to be consistently ahead of the curve when it comes to identifying modifiable disease risk factors.

I initially found it hard to answer this since our recommendations are based on the identical peer-reviewed literature that is often published by the medical establishment itself.

The reply to this question I now give relates to motivation and interpretation.

We at Life Extension don’t want ill health to befall our supporters...ever! We therefore interpret statistical data with the motivation to thwart degenerative disease for an indefinite time period.

So it was not hard for us to notice long ago that people with lower blood pressure lived considerably longer. Our recommendation relating to blood pressure therefore has always been to keep readings below 120/80 mmHg, with an ideal number for most individuals being 115/75 mmHg.

The medical establishment disagreed and said that blood pressure up to 139/89 mmHg was not a problem. A huge study released in 2015 exposed the lethality of this position. In the group whose target goal systolic blood pressure was below 120 there was a:

- 38% lower relative risk of heart failure;
- 43% lower relative risk of cardiovascular death;
- 27% lower relative risk of mortality overall.

This article will review the establishment’s multi-decade failure to recognize the dangers of higher blood pressure. More important, we will reveal how you can safely lower blood pressure to what most all parties now concur are optimal ranges.
Hypertension is the term used to define high blood pressure. A simple dictionary definition of hypertension is “abnormally high blood pressure.”

A medical definition of hypertension is “blood pressure high enough that it may eventually cause health problems, such as heart disease.”

The problem over the past 49 years is that the medical establishment has mostly relied on the dictionary definition to diagnose hypertension. Since most aging people have blood pressure over 120/80 mmHg, physicians viewed this as “normal” and did nothing until levels exceeded 139/89 mmHg.

To understand the magnitude of this, one of every three adults in the United States has blood pressure readings over 139/89 mmHg. When you include those with readings over 120/80 mmHg, it’s easy to see why so many people suffer disorders related to hypertension.

Stated simply, the vast majority of adults have blood pressure high enough to cause heart disease and other health issues.

How Life Extension Realized This So Early

The gold standard for identifying beneficial longevity factors has long been to look at biomarkers in people that practice calorie restriction.

Calorie restrictors don’t behave like most of us, especially when viewing the toxic high-calorie foods that are endlessly advertised on television. As a result of their reduced food intake, calorie restrictors’ glucose, insulin, and lipid blood levels are remarkably low. So is their blood pressure.

Without taking medications, calorie restrictors over age 50 often have blood pressure readings around 90/60 mmHg and they are in remarkably good health.

We at Life Extension recognized this phenomenon in the 1980s and recommended most people strive to maintain blood pressure readings below 120/80 mmHg to emulate this longevity benefit observed in people practicing calorie restriction.

New Study Wakes Up Medical Establishment!

A large human study was initiated in year 2010 whose purpose was to assess whether targeting a reduction of systolic blood pressure below 120 mmHg was superior to the current standard of reducing it to below 140 mmHg.

The doctors focused on the systolic (top) number because it is a better predictor of heart attack and stroke. The “systolic” reading reflects the amount of pressure placed on the arterial system with each heartbeat.

The name of this study is Systolic Blood Pressure Intervention Trial, also known as SPRINT. It was published in the New England Journal of Medicine in 2015 and garnered huge media coverage.

The SPRINT study was supposed to last 5 years, but was stopped after 3.26 years because it was abundantly clear that the group whose blood pressure was reduced to a target systolic range under 120 mmHg were dying 26% less frequently.

What impressed the study’s researchers the most was a striking 43% lower relative risk of cardiovascular death in those whose blood pressure was aggressively reduced.

The SPRINT study also found that heart failure rates plummeted by 38% in patients whose target blood pressure aimed below 120 mmHg. Heart failure occurs when the heart cannot pump enough blood and oxygen to support other organs in one’s body. It is a leading cause of hospitalizations and costs this nation an estimated $32 billion each year.

Heart disease happens to be the number one cause of death in the United States, killing about 610,000 Americans each year. The dramatic (43%) drop in cardiovascular deaths shown in the SPRINT study

Risk Reduction of Intensive Treatment (Below 120) Compared to Standard Treatment (Below 140)

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<th>Outcome</th>
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<td>Death from cardiovascular causes</td>
<td>43%</td>
<td></td>
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<tr>
<td>Heart failure</td>
<td>38%</td>
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<tr>
<td>Death from any cause</td>
<td>27%</td>
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<tr>
<td>First heart attack, acute coronary syndrome, stroke, heart failure, or death from cardiovascular causes</td>
<td>25%</td>
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<tr>
<td>Heart Attack</td>
<td>17%</td>
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</tr>
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<td>Stroke</td>
<td>11%</td>
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This chart shows reductions in death and disease when systolic blood pressure target is below 120 compared to below 140.
motivated mainstream cardiologists to question their long-standing practice of largely ignoring their patient’s blood pressure until readings exceeded 139/89 mmHg.

Based on widespread media coverage and physician concurrence, it appears the medical establishment has finally woken up to what readers of this publication were told to do in the 1980s.

**Historic Failures to Recognize Disease Causation**

It is regrettable that practicing clinicians did not bother to observe that patients with blood pressure readings over 120/80 mmHg had elevated rates of cardiac death. But then again, it took decades of research to raise suspicion of a causative role of cigarette smoking in the development of lung cancer.

Physicians in the 1930s were certainly aware that respiratory illnesses happened with greater frequency in smokers. Yet it took decades of published research for the tobacco-disease causation issue to be raised, and it wasn’t until 1964 that the Surgeon General stated that smoking increases risk for a host of deadly illnesses.6

A similar scenario has occurred with the debate as to what the safe upper limit for blood pressure should be. Persuasive evidence and common sense long ago indicated that Life Extension’s recommendation of 115/75 mmHg would spare many lives compared to the establishment’s position that blood pressure readings up to 139/89 mmHg were alright.

**How Many Preventable Deaths?**

Each year about 2.5 million Americans die.7 This number is expected to steadily rise as the aging population increases. Life Extension’s fundamental mission is to reverse this upward mortality trend in aging humans.

We wanted to glean some idea as to how many needless deaths occurred because it took the medical establishment so long to recognize the lifesaving benefits of lower blood pressure ranges. So we took the most conservative percentage of death reduction found in the SPRINT study, which was a 27% reduction in overall mortality in people age 50 and older. We then did a calculation using the approximate 2 million total deaths that have occurred each year in the United States in people age 50 and older dating back to year 1985.

Based on this 27% reduction in all-cause mortality, about 540,000 American lives could have been spared each year had the medical establishment adopted Life Extension’s recommendation to keep blood pressure levels below 120/80 mmHg.

This number of 540,000 annual deaths that could have been prevented is of course an exaggeration. It assumes that everyone ages 50 and older would have had their blood pressure checked and followed an aggressive program to reduce it to safe ranges. The reality is that hypertension is a “silent

**Similar to Controversy about Glucose**

You may recall that in the 1980s, fasting blood glucose levels up to 139 mg/dL were considered “normal” by the establishment. Conventional doctors today consider a glucose level over 125 mg/dL indicative of type II diabetes. A glucose level over 99 mg/dL can diagnose prediabetes.

Based on blood results obtained from calorie restrictors in the 1980s, we at Life Extension knew that conventional medicine’s upper limit for glucose was dangerously high. We advised back then that people strive to keep their glucose levels below 100 mg/dL. Since then, we advised that optimal fasting glucose levels are below 86 mg/dL, which is not always possible to attain.

Reducing blood pressure is simpler (than glucose) for most individuals to achieve using a combination of lifestyle changes, nutrients, and the appropriate antihypertensive medications when necessary.
killer” and many people don’t know they have it. Patients prescribed antihypertensive drugs and lifestyle changes often don’t comply.

There were nonetheless tens of millions of Americans treated for hypertension since 1985, with the physician’s goal being to reduce it only to under 140/90 mmHg. This is where the needless carnage arose and where mainstream medicine needs to look at this failure as an example of the cost in human lives that occurs when published studies and common sense are discarded.

**Our Delicate Vasculature**

The extremely fragile nature of our vascular system remains an unappreciated phenomenon.

In youth, our arteries are flexible and readily expand and contract with each heartbeat as do our delicate capillary beds. As you can see by the illustration on this page, arteries narrow into smaller arterioles that eventually thin further down to microscopic capillaries. These capillaries are so tiny that red blood cells often have to bend their shape just to squeeze through and be returned to the venous system.

With each heart beat there is blood pressure exerted on arteries, arterioles, and delicate capillary beds. When blood pressure is in a perfect range, oxygen/nutrient enriched blood is delivered to all the body’s cells and returned to the heart with minimal damage to the vascular system.

Any increase in the pressure beyond what is needed to push blood through the vascular network causes additional stress and endothelial damage. This can manifest acutely in the form of a cerebral hemorrhage, where an arteriole in the brain ruptures and may quickly lead to death.

In most cases of higher-than-needed blood pressure, however, silent damage is constantly inflicted on the inner arterial lining (the endothelium) including the delicate capillaries. The result is a progressive loss of blood flow and cellular functionality that can manifest as ischemic heart disease, ischemic stroke, renal failure, and/or dementia.

It was this fundamental understanding of the delicate structure of the vascular system that prompted Life Extension to recommend lower blood pressure ranges in the 1980s.

### Fallacy of “Prehypertension”

Not all physicians have been oblivious to the increased vascular risks in people with higher systolic blood pressure.

The term “prehypertension” was introduced to alert people that systolic pressure between 120 and 139 mmHg was reason to initiate lifestyle changes or modest drug therapy.

The problem with using the term prehypertension is that it caused patients and physicians to not take seriously the dangers it represents.

A systematic review on the clinical relevance of prehypertension was published in 2013 and
revealed more increases in vascular risk than the carefully controlled SPRINT study.

The authors of this 2013 review performed an analysis of 18 previous studies that included a whopping 468,561 patients. They found that patients with prehypertension had a:

- **55% increased** risk of cardiovascular disease,
- **50% increased** risk of coronary heart disease,
- **71% increased** stroke risk.

The authors went a step further and looked at people in the low prehypertension range, defined by systolic blood pressure of just 120 to 129 mmHg. Risk of cardiovascular disease in this prehypertension group was **46% higher** than for individuals with systolic blood pressure levels **below 120 mmHg**.

According to this very large analysis, even lower-range prehypertension has a significant impact on morbidity and mortality, which is why Life Extension has urged for so long that **optimal** blood pressure readings are **115/75 mmHg**.

Based on the totality of the evidence, the term “prehypertension” should be **discarded** and most adults with systolic blood pressure over **119 mmHg** should face the reality that they are **hypertensive** from a medical definition standpoint, i.e., they are at an **increased** risk of health problems.

This is analogous to the term prediabetes, which is used today to describe people with fasting glucose between 100-125 mg/dL. These individuals should instead be diagnosed as “diabetic” and treated accordingly. This includes lifestyle modifications that safely reduce blood glucose levels to optimal ranges.

Please know that upper-level acceptable systolic blood pressure readings at one time were considered a startling high of **160 mmHg**. They were later reduced to **150 mmHg**, then to **140 mmHg**, and mercifully now down to **120 mmHg**.

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**Do Not Rush to Lower Blood Pressure**

The SPRINT study was released in 2015 and is likely to be a game-changer as it relates to better guidelines for blood pressure control. There were, however, limitations that cause us to urge caution before initiating steps to drastically lower your blood pressure.

The SPRINT study was of relatively short duration and longer term side effects from the aggressive drug therapies may not be fully understood.

Type II diabetics were excluded from SPRINT because a previous trial on diabetics called ACCORD failed to show a benefit in aggressively reducing their blood pressure. This failure may reflect the devastating impact on the vascular system inflicted by the elevated glucose levels seen in diabetics. Said differently, the severity of the endothelial damage that diabetics sustain might overwhelm the beneficial effects of aggressively lowering their systolic blood pressure.

Those who have had chronic higher blood pressure levels often suffer considerable damage to their delicate endothelial linings. An unfortunate consequence for some individuals is that they need to maintain somewhat higher blood pressure levels to provide adequate blood flow to the capillaries in their brain, kidneys and other tissues.

We have discussed this problem in previous issues of this publication, whereby those with severely damaged capillary beds require higher blood pressure to sustain organ/tissue function, even though over the longer term this higher pressure on the arterial system inflicts additional damage to the endothelium.

The sad case for some individuals is that taking overly aggressive steps to push down blood pressure levels could create side effects such as hypotension, which causes one to faint.
Providing You with Real World Guidance

The encouraging news about all this is that if one intelligently embarks on a program to reduce their blood pressure to more optimal ranges, there are simple blood tests available that can identify if adverse effects are occurring in response to overly aggressive drug treatment.

These and other commonsense approaches to achieving optimal blood pressure levels are described in articles contained in this month’s issue. Readers should understand that the more one is willing to make healthier lifestyle changes, the less in the way of antihypertensive drugs they are likely to need, which should translate into a lower side effect risk profile.

We published an article 1.7 years ago that describes the ideal antihypertensive drug to begin with. This drug (telmisartan) not only lowers blood pressure in what we consider the most efficient manner, but has side benefits that include improvements in endothelial function and survival not seen with other antihypertensive medications.

Challenges in Persuading Our Supporters

I’ve been involved in helping people avoid degenerative illness since the 1970s.

One of my greatest challenges has been to persuade health-conscious individuals that they may need a prescription medication to optimize their blood pressure.

An argument I’ve encountered from people who eat properly, exercise, and take dietary supplements is that they don’t think they have to worry about slightly elevated blood pressure. While all these healthy practices can help protect against endothelial dysfunction, one cannot overlook the structural damage inflicted to our vasculature by higher-than-optimal blood pressure.

I also have run into resistance by people who think a blood pressure check several times a year at their doctor’s office is sufficient. Based on my personal experience with my at-home blood pressure monitor, I know that my systolic pressure can range from a low of 95 mmHg to a high of 140 mmHg under stressful circumstances. When I see my blood pressure any level above 115/75 mmHg, I take an extra 40 mg dose of the drug telmisartan to reduce it.

A more serious effect observed in the SPRINT study was that there was almost a 3.5-fold increased risk of kidney damage in those aggressively treated for hypertension using multiple drugs. It is not known if it was the multiple drugs or overly aggressive lowering of the blood pressure that caused this kidney damage.

The authors of the SPRINT study were quick to point out that the huge reductions in morbidity and mortality in the aggressively-treated hypertensive group far outweighed the side effect risks observed. As one outside doctor who critiqued the study stated, “If there is a problem with an individual patient, you can always back off.”

Our Precious Endothelium

Our inner arterial lining is called the endothelium. The endothelium is an ultra-thin, one-cell-thick layer of cells. It loses youthful function in response to normal aging.

An underappreciated factor in the development of cardiovascular disease is endothelial dysfunction. The consequences of endothelial dysfunction are diminished circulation, high blood pressure, thrombosis, and atherosclerosis, all of which are major causes of stroke and heart attack.

Fortunately, astute scientists have discovered potent natural methods to tackle the underlying causes of endothelial dysfunction.

In addition to nutritional/lifestyle interventions, maintaining optimal blood pressure readings is essential to protect against loss of endothelial function.
If I did not have an at-home blood pressure monitor, I would never have known my blood pressure spiked this high.

To make matters worse, your endothelium does not give you credit for the period of the day when your blood pressure is lower. It is during periods when blood pressure spikes up that massive vascular damage occurs. So I hope every one of you has an at-home blood pressure monitor based on our previous recommendations. As you can see on page 14, the price has come down considerably from what they cost just a few years ago.

To learn more about the blood pressure lowering drugs we favor, you can log on at no cost to: LifeExtension.com/hypertension

These drug recommendations are not based on commercial interests, just our sincere desire to keep you alive and healthy for decades to come.

For longer life,

William Faloon

(Turn page to review at-home blood pressure monitor and suggested blood tests. References for this article begin on page 16.)
Many physicians recommend that patients check their blood pressure at home on a regular basis. Now you can do so with the easy-to-use AccuFit™ Plus Cuff Multi-User Blood Pressure Monitor. It provides:

- A customizable cuff to fit any size arm (8.6 to 16.5-inch circumferences)
- Irregular heartbeat detection (IHB)
- Data storage for up to four family members (60 results each)
- Easy-to-retrieve results for reporting to your physician
- Clinical accuracy

To order AccuFit™ Plus Cuff Multi-User Blood Pressure Monitor, call 1-800-544-4440 or visit www.LifeExtension.com
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:

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You can place your order by calling 1-800-208-3444 or log on to LifeExtension.com/CBC. You’ll be sent a list of drawing stations in your area along with a pre-paid requisition. You can walk into the drawing station nearest you at your convenience. Our price for all these tests is about 50% less expensive than commercial labs, and you get your results back fast. You also have free access to our Wellness Specialists to help review your results.

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


AS WE SEE IT

References

16 | LIFE EXTENSION | NOVEMBER 2016
**Taurine**

**BOOSTS BRAIN CELL REGENERATION & SUPPORTS WHOLE-BODY HEALTH**

Taurine, a free amino acid, is “one of the most essential substances in the body.” But as we age, taurine levels decline.

Research has found that taurine can promote new cell formation in the area of the brain associated with learning and memory.

Taurine also enhances neurites, tiny projections that help brain cells communicate with each other.

Past research has also shown the ability of taurine to maintain and support:

- Cardiovascular health
- Insulin sensitivity
- Modulation of the immune system
- Regulation of the central nervous system
- Liver function
- Eye health
- Hearing function

**References**


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

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**Taurine**

Item #01827 • 90 vegetarian capsules

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Non-GMO
Blueberry Extract

Slows Down AGING

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

Blueberries provide health-boosting benefits shown to:
- Enhance heart health
- Maintain brain function
- Sustain healthy blood sugar levels already within normal range
- Support smooth, firm skin
- Improve movement and coordination

Blueberry extract is more potent than the whole berry, providing greater metabolic support throughout the body and without the excess sugar of raw fruit.

Suggested dose is one capsule daily for most individuals.

Non-GMO

AuroraBlue® is a registered trademark of Denali BioTechnologies, Inc.

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

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Nicotinamide Riboside Shows Promise in Regenerative Medicine

An article published in the journal *Science* reveals more positive findings for *nicotinamide riboside*, a natural compound that is a precursor of nicotinamide adenine dinucleotide (NAD+), found in all living cells.*

A team from École Polytechnique Fédérale de Lausanne, along with researchers from Zurich, Canada and Brazil, found that treatment with *nicotinamide riboside* rejuvenated muscle stem cells in aged mice and prevented muscle stem cell senescence in a mouse model of muscular dystrophy. They also determined that the compound delayed the senescence of neural and melanocyte stem cells in addition to increasing lifespan in mice.

The team identified the molecular chain that regulates the function of mitochondria (the cells’ energy-producing organelles) and how mitochondria change during aging. *We were able to show for the first time that their ability to function properly was important for stem cells,*” announced lead researcher Johan Auwerx.

*Editor’s Note:* “We gave nicotinamide riboside to two-year-old mice, which is an advanced age for them,” explained first author and PhD student Hongbo Zhang. “This substance, which is close to vitamin B3, is a precursor of NAD+, a molecule that plays a key role in mitochondrial activity. And our results are extremely promising: muscular regeneration is much better in mice that received nicotinamide riboside, and they lived longer than the mice that didn’t get it.”

*Tart Cherry Supplementation Benefits Athletic Performance*

A study published in the *Journal of the International Society of Sports Nutrition* found that short-term supplementation with powdered cherries boosted athletic performance in test subjects.*

Researchers were curious to determine whether use of a tart cherry supplement prior to and following strenuous endurance exercise would affect markers of oxidative stress, muscle damage, inflammation, and muscle soreness.

In a double-blind study, eighteen men and nine women, all endurance-trained runners or triathletes, were randomly assigned to ingest capsules containing 480 mg of either a placebo or the powdered cherries and then asked to complete a half-marathon run. Fasting blood samples and quadriceps muscle-soreness ratings were taken before the run and later at one, 24 and 48 hours post-run. Subjects who took the cherry powder averaged 13% faster half-marathon finish times compared to the placebo group. They also had inflammatory markers that were 47% lower. Additionally, the cherry group’s post-run muscle pain faded faster compared to the placebo group.

*Editor’s Note:* In addition, the study’s results revealed that aerobically trained individuals using supplementation of powdered tart cherries prior to an endurance challenge had reduced immune and inflammatory stress, attenuated markers of muscle catabolism, better maintained redox balance, and increased performance.

Treatment of TIA with Aspirin Could Help Prevent Stroke

An article in *The Lancet* suggests that the use of aspirin by individuals experiencing transient ischemic attack (TIA) could reduce the risk of a major stroke during the days following the event.*

“The risk of a major stroke is very high immediately after a TIA or a minor stroke, but only for a few days,” explained researcher Peter Rothwell from Nuffield Department of Clinical Neurosciences, John Radcliffe Hospital, Oxford, UK. He added, “We showed previously...that urgent medical treatment with a ‘cocktail’ of different drugs could reduce the one-week risk of stroke from about 10% to about 2%, but we didn’t know which component of the ‘cocktail’ was most important.”

It was discovered that aspirin’s benefit primarily occurred during the weeks following a TIA and that it was associated with a 70% to 80% reduction in the early risk of fatal or disabling stroke in contrast with the 15% reduction in long term stroke risk uncovered by previous research.

*Editor’s Note: Dr. Rothwell elaborated, “Our findings confirm the effectiveness of urgent treatment after TIA and minor stroke, and show that aspirin is the most important component.”

Testosterone Treatment Does Not Increase Prostate Cancer Risk

The risk of prostate cancer is not higher for men who have received testosterone replacement therapy compared to those who have not, according to a study that analyzed Swedish medical data on over a quarter of a million patients. The research was presented at the annual meeting of the American Urological Association in San Diego, California.*

The study, conducted by New York University Langone Medical Center, was aimed at helping settle the debate over the supposed link between testosterone replacement therapy and prostate cancer risk. Researchers found that not only was there no increase in risk, but men who received testosterone replacement therapy for more than a year had a 50% lower chance of developing an aggressive form of prostate cancer in comparison with their non-treated counterparts.

Up to now, there had been concern that testosterone replacement therapy might be linked to prostate cancer, because the disease is often treated with drugs that radically lower levels of male sex hormones. Life Extension® refuted this false notion 19 years ago by pointing out numerous studies showing higher levels of testosterone are NOT associated with increased prostate cancer risk.


Lack of Vitamin D Prevalent among Type I Diabetic Youths

A recent article appearing in *Diabetes Research and Clinical Practice* revealed a high risk of deficient vitamin D levels in type I diabetic adolescents and children.*

Terri Lipman, PhD, CRNP, FAAN, and colleagues at the School of Nursing, University of Pennsylvania, evaluated the 25-hydroxyvitamin D and glucose levels of 197 diabetic children and adolescents who were seen by the Diabetes Center for Children at the Children’s Hospital of Philadelphia. Levels of hemoglobin A1c (a measure of diabetes control), and other factors were ascertained from patient records.

Deficient vitamin D levels of less than 20 ng/mL were present in 40.6% of the diabetic subjects and 49.2% had insufficient levels ranging from 20 ng/mL to 30 ng/mL. Only 10.2% had levels higher than 30 ng/mL.

*Editor’s Note: According to the authors, the data suggest the need for monitoring of vitamin D levels in all young type I diabetics.

Meta-Analysis Finds Calcium Protects Against Adenoma

The World Journal of Gastroenterology published the results of a systematic review and meta-analysis of randomized trials that indicate a protective effect for calcium supplementation against the risk of colorectal adenoma, a precursor of colorectal cancer.*

European researchers from Humanitas Clinical and Research Center, Milan, Italy, selected four trials that compared the effects of 1,200 mg to 2,000 mg of elemental calcium per day to a placebo against the risk of colorectal adenoma during up to 60 months of treatment and follow-up. Subjects included men and women with resected colorectal cancer or those who had colorectal adenomas surgically removed prior to enrollment. Colonoscopic examinations conducted over the follow-up periods ascertained colorectal adenoma recurrence.

All of the trials reported a lower incidence of colorectal adenomas in the calcium group. The meta-analysis determined that subjects who received calcium experienced a 10% to 15% lower risk of adenoma recurrence compared with those who received the placebo.

Editor’s Note: The authors note that calcium may protect against colorectal neoplasia by binding bile and fatty acids, which reduces their carcinogenic effects on colon epithelial cells. Additionally, the mineral has a direct antiproliferative effect on cells and promotes cellular differentiation and apoptosis (programmed cell death). The dose used, however, is higher than what most people should take in supplement form. For bone health, most women should take about 700 mg of elemental calcium a day, whereas men should take about 500 mg daily.


Inflammation is Likely Culprit in GERD-Related Esophagitis

Research published in the Journal of the American Medical Association implicates an inflammatory reaction triggered by the presence of stomach acid in the esophagus, rather than burns caused by the acid itself, as the damaging factor in patients with gastrointestinal reflux disease (GERD).*

The study included 12 patients being treated for GERD with proton pump inhibitors (PPIs) who were asked to discontinue their medication. Participants underwent esophageal biopsies at the beginning of the study and one and two weeks after stopping the drugs.

At one and two weeks, biopsies showed signs of T-lymphocyte-predominant inflammation. All subjects had evidence of esophageal acid exposure and esophagitis at two weeks, which is consistent with the time needed for damage caused by inflammation to develop. “These findings suggest that the pathogenesis of reflux esophagitis may be cytokine-mediated rather than the result of chemical injury,” the authors conclude.

Editor’s Note: Co-senior author Dr. Rhonda Souza from Veterans Affairs North Texas Health Care System, University of Texas, predicted that “Someday we might treat GERD with medications that target the cytokines or inflammatory cells that really cause the damage to the esophagus.”

*JAMA. 2016 May 17.

Phenotypes Help Assess Cardiometabolic Risk in Prediabetes Patients

Prediabetes is associated with increased risk of diabetes, cancer, cardiovascular disease, and dementia, but that risk varies widely among individuals. Now, a new study published in The Lancet Diabetes & Endocrinology has found a method to more accurately assess that risk.*

Scientists from the German Center for Diabetes analyzed data from a study involving 1,003 subjects and found that determining the status in patients of four major phenotypes—fatty liver, visceral obesity, the action of insulin and the production of insulin—can help explain the variability of risk in individuals as well as enhance the prediction and prevention of their cardiometabolic risk.

Scientists studied the prevalence of the four at-risk phenotypes in people with prediabetes who were in different body mass index categories. They found that insulin secretion failure is the biggest at-risk phenotype for people of normal weight, while fatty liver and visceral obesity were strongly associated with overweight and obese prediabetes patients.

Editor’s Note: "If proven to be effective, this strategy could be included in guidelines about the prevention and treatment of diabetes and associated diseases,” said first author of the article Norbert Stefan. A co-author, Hans Häring, adds, "The application of precise phenotyping strategies in clinical trials will also help to improve understanding of the pathophysiology of cardiometabolic diseases."

Healthy Lifestyle Could Prevent Half of Cancer Deaths

An estimated tens of thousands of US cancer deaths could be prevented through the adoption of a healthy lifestyle, according to a study published in the Journal of the American Medical Association.* Researchers from Massachusetts General Hospital and Harvard Medical School analyzed data from 89,571 Caucasian women and 46,399 Caucasian men who were enrolled in two ongoing cohorts. 16,531 of the women and 11,731 of the men maintained patterns of healthy lifestyles, including no current smoking, moderate or no alcohol consumption, a BMI between 18.5 and 27.5, and at least 150 minutes of moderate exercise or 75 minutes of intense exercise weekly. After comparing cancer rates between the healthy-lifestyle group and the remaining subjects, researchers concluded that 20% to 40% of common cancer cases and about half of deaths could be prevented by adopting a healthy lifestyle.

The authors say that more study is needed to see if their findings hold true among other ethnic groups.

Editor’s Note: The authors of the study concluded, “These findings reinforce the predominant importance of lifestyle factors in determining cancer risk. Therefore, primary prevention should remain a priority for cancer control.”

*JAMA Oncol. 2016 May 19.

Vitamin D Reduces Body Fat in Toddlers

A new study in the journal Pediatric Obesity shows that vitamin D given to babies seems to lead to less body fat and more muscle mass when they become toddlers.* This is the first time a connection has been found between healthy vitamin D levels in a baby’s first year and development of muscle mass. Researchers made the discovery when they followed up on a 2013 study in which 132 babies in Montreal, Canada, were given vitamin D3 in varying dosages. The 2013 study was only designed to confirm the importance of vitamin D for bone density, but the follow-up revealed that infants with vitamin D stores higher than recommended by the Canadian Paediatric Society averaged about 450 grams less body fat at age 3.

Both studies agree that a vitamin D supplement of 400 IU a day in an infant’s first year aids in the growth of strong bones.

Editor’s Note: “We were very intrigued by the higher lean mass, the possibility that vitamin D can help infants to not only grow healthy skeletons but also healthy amounts of muscle and less fat,” said Hope Weller, one of the authors of the study and director of the Mary Emily Clinical Nutrition Research Unit at McGill University.

*Pediatr Obes. 2016 Feb.

Limitless Potential Found in New Cancer-Predicting Software

In a recent study published in the journal Scientific Reports, the newly invented technology called Wregex 2.0 was implemented to analyze mutations within proteins.* The new software is capable of scanning and analyzing up to 40,000 proteins in just one minute.

According to the study, the technology has demonstrated itself capable of identifying mutations that might be associated with or induce the development of many diseases, including cancer. Further, the technology is capable of giving researchers data about the specific mutations of proteins, which could yield a blueprint of the manner in which a cancer may progress.

Potentially, this software and the information it provides may prove useful in innumerable ways. Among other possible uses, it could, if explored further, be used to guide doctors in making optimal treatment decisions about a multitude of diseases. And it would do so with extreme reliability, given the immense amount of data these analytics could provide.

Editor’s Note: Currently, the software uses only the mutations already identified in the “Catalogue of Somatic Mutations in Cancer” list. But the study reveals that this technology has the potential to operate in conjunction with a database of mutations several orders of magnitude larger.


—Chase R. Falcon
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.

**NAD+ Cell Regenerator™**
Item #01904 • 30 vegetarian capsules

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Non-GMO

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.

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

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

**ANTHOCYANINS**

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

Life Extension offers 100% natural Tart Cherry with CherryPURE®. This formulation provides all the muscle-supporting benefits of tart cherries and matches the anthocyanin dose used in successful clinical trials.

**References**


Non-GMO

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

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**Tart Cherry with CherryPURE®**

Item #02023 • 60 vegetarian capsules

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To order Tart Cherry Extract with CherryPURE®, call 1-800-544-4440 or visit www.LifeExtension.com

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Multiple Benefits of Daily, Low-Dose Aspirin

Supports Healthy Blood Circulation

Taking one 81 mg (low-dose), enteric-coated aspirin daily helps to maintain normal platelet aggregation in blood vessels via several mechanisms, while also temporarily relieving minor aches and pains.

To order Aspirin 81 mg, call 1-800-544-4440 or visit www.LifeExtension.com

Do not exceed recommended dosage. Drink a full glass of water with each dose. Adults and children 12 years of age and over: take 4 to 8 tablets every four hours not to exceed 48 tablets in 24 hours, unless directed by a doctor. Children under 12 years of age: consult a doctor. Reye’s syndrome: Children and teenagers who have or are recovering from chicken pox or flu-like symptoms should not use this product. When using this product, if changes in behavior with nausea and vomiting occur, consult a doctor because these symptoms could be an early sign of Reye’s syndrome, a rare but serious illness. Allergy alert: Aspirin may cause a severe allergic reaction which may include hives, facial swelling, asthma (wheezing), or shock. Stomach bleeding warning: This product contains a nonsteroidal anti-inflammatory drug (NSAID), which may cause stomach bleeding. The chance is higher if you: are age 60 or older, have had stomach ulcers or bleeding problems, take a blood thinning (anticoagulant) or steroid drug, take other drugs containing prescription or nonprescription NSAIDs (aspirin, ibuprofen, naproxen, or others), have 3 or more alcoholic drinks every day while using this product, or take more or for longer time than directed. Do not use if you have ever had an allergic reaction to any other pain reliever/fever reducer. Ask a doctor if: stomach bleeding warning applies to you, you have a history of stomach problems, such as heartburn, you have high blood pressure, heart disease, liver cirrhosis, or kidney disease, you are taking a diuretic, or you have asthma. Stop use and ask a doctor if you experience any of the following signs of stomach bleeding: feel faint, vomit blood, have bloody or black stools, have stomach pain that does not get better, allergic reaction occurs, ringing in the ears or a loss of hearing occurs, pain gets worse or lasts more than 10 days, fever gets worse or lasts more than 3 days, any new symptoms appear, or redness or swelling is present in the painful area. If pregnant or breast-feeding, ask a health professional before use. It is especially important not to use aspirin during the last 3 months of pregnancy unless definitely directed to do so by a doctor because it may cause problems in the unborn child or complications during the delivery. Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.

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.
HOW POMEGRANATE MAY PROTECT AGAINST CANCER
How Pomegranate May Protect Against Cancer

Pomegranates are best known for their ability to improve arterial health. Accumulating data have demonstrated that pomegranate has cancer protective properties as well.¹⁻³

Some of the most promising findings on pomegranate extracts show their ability to impede progression of prostate cancer. Additional studies indicate that pomegranate may protect against breast and colon cancer as well.⁴⁻⁵

Dietary factors are increasingly recognized as playing a role in cancer development. More than 70% of certain malignancies—like colorectal cancer—are related to diet and lifestyle factors.⁶

Studies show that high fruit and vegetable consumption is associated with lower cancer incidence.⁶ That’s especially true when diets include large amounts of polyphenols from specific plant foods.⁷

The challenge is that, while adding polyphenol-rich foods to our diets is beneficial, it doesn’t always provide enough polyphenols to exert a meaningful effect on prevention.⁶ That’s where pomegranate extracts may play a crucial role.
Pomegranate’s Targeted Effect

While most of the clinical studies on pomegranate’s anticancer benefits have been conducted in men with prostate cancer, the encouraging results can be expected to translate to other malignancies as well. In fact, numerous animal and basic lab studies have now added to our understanding of pomegranate’s promise in cancer prevention.

One of the first questions about any natural compound (or drug, for that matter) is how well it is absorbed after oral intake. It is also important to determine how much of the compound ultimately reaches its target tissues (glands, organs, etc.).

Studies show that the pomegranate components ellagitannins (which are the most abundant polyphenol found in pomegranate juice) are not only extremely well-absorbed, but also get delivered to many of the tissues where human cancers arise—especially prostate, colon, and intestinal tissues. This important finding was confirmed in a human study of colorectal cancer patients. When the patients supplemented with 900 mg of pomegranate extracts for 15 days prior to surgery, it resulted in significant accumulation of the extracts and their active breakdown products in colon tissue, indicating a targeted effect.

Once they get to their target tissues, pomegranate compounds exert numerous effects that can help prevent tumors from developing and spreading. This has been demonstrated in animal studies of xenografts, which are implants of human cancer cells that are surgically engrafted into host animals. Xenograft studies now demonstrate that not only can pomegranate extracts delay the development of a tumor after it has been implanted, but they can also decrease the size and blood supply of those tumors that do develop.

Supplementation with three specific compounds found in pomegranate—luteolin, ellagic acid, and punicic acid—has also been shown to inhibit the progression and spread of prostate cancer in animals injected with human tumor cells. In this study, pomegranate supplementation inhibited the growth of the primary tumor, and also shut down biochemical signaling pathways required for metastasis. As a result, none of the implanted tumors metastasized. This is a tremendously important finding, especially considering the terrible prognosis in humans when metastasis occurs.

Pomegranate Slows Prostate Cancer Progression

The most promising studies on pomegranate’s anticancer actions are on its ability to slow the progression of prostate cancer.

In prostate-cancer patients, serum PSA levels are the most commonly used marker to assess disease status. One standard for evaluating cancer progression is to measure the time it takes for PSA levels to double from a baseline value. The longer it takes for PSA to double, the slower the cancer is progressing.

Studies show that supplementation with pomegranate juice or extracts can significantly increase the time it takes for PSA to double in men with prostate cancer. In one study, men received 8 ounces of pomegranate juice daily following surgery or radiotherapy for prostate cancer. Prior to treatment, the subjects’ PSA doubled in an average of 15 months, indicating quite rapid disease progression. But after treatment with pomegranate juice, PSA took an average of 54 months to double its value, which is a clinically and statistically significant difference.

Another study evaluated men with recurrent prostate cancer (which is cancer that comes back after treatment such as surgery). In this study, taking pomegranate extract daily for up to 18 months increased the time it took for PSA to double from 11.9 months at baseline to 18.5 months. These studies offer evidence of pomegranate’s ability to slow down the progression of prostate cancer.
Actions Against Colon and Breast Cancer

Many fast-growing tumors can be induced in small animal models by treating them with known cancer-causing chemicals. This is a technique that is commonly used in studying cancers of the colon and digestive tract.

Such cancer-inducing treatment leads to the development of early precancerous lesions known as aberrant crypt foci in colon tissue, which represent areas of abnormal cell replication and growth in the folds of tissue that line the intestine. If left untreated, aberrant crypt foci have a high likelihood of progressing to intestinal polyps, and then to fully-developed cancers.

But that story changes when animals are given pomegranate extracts prior to exposure to the toxic cancer-causing compound. In these scenarios, aberrant crypt foci occurred significantly less frequently in the animals supplemented with pomegranate extracts, compared to the unsupplemented animals.

These studies show pomegranate’s ability to help prevent the precancerous changes that can lead to...
the development of tumors. Other studies go a step further, and demonstrate pomegranate’s ability to improve survival rates in animals with colon cancer.18

A study published earlier this year showed that pomegranate extracts have protective effects in chemically-induced breast cancer. When pomegranate extracts were given to rats before and after they were exposed to a chemical that caused breast cancer, the extract was found to reduce the incidence, number, and size of breast tumors. This led the researchers to conclude that pomegranate’s compounds ”could be developed as a chemopreventive drug to reduce the risk of breast cancer.”19

Studies have also indicated pomegranate’s protective effect against cancer in patients with inflammatory bowel diseases. Chronic intestinal inflammation is a known precursor of intestinal malignancies, which is why inflammatory bowel diseases such as ulcerative colitis and Crohn’s disease substantially increase the risk of such cancers.

The good news is that in studies of animals with experimentally-induced colitis, the pomegranate constituent ellagic acid has been found to inhibit the progression of colitis, and to downregulate many of the molecular signaling pathways that get switched on and promote cancer in colitis patients.20

Seven Ways Pomegranate Attacks Cancer

One reason why pomegranate extracts have demonstrated potent effects against a variety of different types of malignancies is because they mount a multitargeted attack against cancer cells. Cancer is a complicated, multifactorial disease, with no single cause and no likely single cure. Because of that, cancer prevention strategies are most effective when they simultaneously address the many underlying causes of cancer in a multitargeted fashion.

This is what makes natural compounds such as pomegranate so appealing for cancer prevention. Unlike synthetic molecules, natural compounds—especially polyphenols—are capable of a multitargeted effect because they operate within the same complicated set of rules and events that cancer itself plays by.

Studies show that pomegranate extracts and polyphenols exert seven different mechanisms of action on developing cancer cells. Let’s take a look at pomegranate’s wide ranging effects:

• DNA damage is considered the initiating phase for cancer development. Mutations in DNA genes can arise from exposure to radiation (including ultraviolet light), to toxins, and even to byproducts of normal metabolism, such as oxidative stress. Laboratory studies demonstrate that pomegranate extracts, including punicalagin and ellagic acid, can prevent DNA damage from many different sources.21-23

• Out-of-control proliferation of cells is the hallmark of cancer. Such proliferation occurs as a result of changes in specific genes that normally maintain regulation over the cell proliferation. When DNA regulatory genes are suppressed, endless cellular replication contributes to more rapid cancer progression. Pomegranate extracts are capable of interfering with abnormal cell-proliferation cycles, thereby impeding aberrant replication.24-27

• Low-grade inflammation is a well-known promoter of cancer cell growth and survival.28 Pomegranate extracts and polyphenols shut down certain inflammatory signals (such as NFkappaB) and suppress the production of other pro-inflammatory molecules.12,20,29-31

• Loss of apoptosis is another change that occurs as cells undergo malignant transformation. Normally dividing cells receive many signals to stop replicating, and in many cases, to take themselves out of the picture so that normal tissue can form. The problem is that malignant cells suppress genes that trigger apoptosis. Pomegranate extracts can restore apoptosis to cancer cells, helping to halt continued expansion and if caught early enough may prevent a tumor from forming.7,19,24,25,32,33
• **Forming new blood vessels (angiogenesis)** is a necessity for burgeoning tumor cells, as they need to nourish themselves during their rapid growth spurt. Pomegranate constituents have shown the ability to inhibit angiogenesis in laboratory and animal studies.\(^{13,34}\)

• **Invasion of local tissue and spread to distant tissue** (called metastasis) heralds the advance of cancer to a much higher grade and raises the risk of death. In order to invade tissues, cancer cells produce “protein-melting” enzymes that allow them to squeeze into tiny spaces between healthy cells, while metastasis requires a host of molecular signals that allow bits of tumor to set up shop in new environments in the body. Pomegranate extracts combat both of these actions by suppressing the production of such tissue-destroying enzymes and signaling molecules, thereby helping prevent cancer cells from spreading.\(^{14,27,35}\)

• **Growth stimulation by sex hormones** is a feature of some of the most common human cancers, including those of the breast and prostate, which have cell-surface receptors for those hormones. Pomegranate extracts slow the growth of many hormone-dependent cancers.\(^{36-39}\)

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**Summary**

Pomegranates contain a host of protective molecules that benefit not only the plant, but those who consume it. While these constituents are best-known for reducing the risk of heart disease, they are now also being explored for their ability to help prevent cancer.

Because cancer is a multifactorial disease, any compound aimed at preventing it should have multitargeted effects. This is a virtue of the active constituents of pomegranate fruit, skin, and even leaves. Lab studies show that **pomegranate extracts** exert at least seven distinct beneficial effects that confer protection to cells against malignant changes, while making those that do mutate less likely to progress.

Animal studies help corroborate that pomegranate supplementation can reduce the incidence of cancers, slow their growth, and reduce the size and number of cancers that develop. Human studies indicate that pomegranate extracts are capable of slowing the progression of prostate cancer. Additional research findings indicate pomegranate’s potential benefits in breast and colon cancer as well.

Pomegranate’s multitargeted properties make it an ideal chemoprevention supplement, one that is widely available and potent in its effects. Given its cardioprotective effects, **pomegranate extracts** offer a well-rounded approach to protecting against some of today’s deadliest diseases.
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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Getting blood pressure under control is essential, but it is only part of the solution.

Over the past decade, it has become clear that daily variations in blood-pressure patterns are also tremendously important, especially in older adults.\(^1,2\)

In healthy people, blood pressure dips somewhat at night, providing at least temporary relief to the pounding damage being done to blood vessels.\(^3\) But in those whose pressure does not fall at night (so-called “non-dippers”), the damage to blood vessels continues around the clock.\(^3\)

As a result, non-dippers have a significantly higher risk of cardiovascular disease and death compared to normal dippers, even when both have the same blood pressure during the day.\(^3\)

About 35% of adults with hypertension are “non-dippers,” meaning that they are at constantly elevated risk for bad outcomes.\(^3\)

The implications of these findings—coupled with a recent study\(^2\) showing optimal systolic target levels—are clear. Most people need to establish more ambitious blood pressure targets—ideally 120 mmHg or lower for the systolic reading. And many people who need to lower their blood pressure also need to find both a daytime and a nighttime solution.\(^1\)

Fortunately, natural compounds are available that not only help lower blood pressure, but can provide around-the-clock management. These natural compounds have blood pressure-lowering properties that are akin to those of many prescription drugs.
Life Extension® has long maintained that the recommended target for systolic blood pressure should be closer to 115 mmHg (as opposed to 140 mmHg). A recent study in the New England Journal of Medicine supports Life Extension’s recommended blood-pressure targets.

This study revealed that millions of people have been lulled into a false sense of security by current recommended blood-pressure parameters. In fact, they are at significantly increased risk of cardiovascular disease and death, and should be taking active measures to lower their blood pressure into a safer range.

Making matters worse, natural fluctuations in blood pressure can cause readings to vary widely, making blood pressure difficult to manage successfully. Blood pressure control works best by utilizing different drug classes of medications at relatively reduced doses rather than using one drug at a maximal dose. This strategy also helps reduce the risk of side effects associated with the maximal tolerated dosing of a single drug.

**Blood Pressure Basics**

When it comes to lowering blood pressure, at-home monitoring is essential to ensure that optimal 24-hour protection is achieved. The availability of low-cost and reliable at-home blood pressure monitors makes this easy.

Lifestyle changes such as losing weight and increasing cardiovascular fitness through exercise can help support healthy blood-pressure levels.

The older drug classes of medication often have side effects that patients find frustrating and bothersome. Side effects can include nighttime urinary frequency with the use of diuretics, or cold hands/feet and sexual dysfunction with the use of beta-blockers. However, some of the newer classes of antihypertensive drugs like angiotensin II receptor blockers generally are better tolerated by patients in comparison with older medications like diuretics and beta-blockers. In fact, some people may only need to take one angiotensin II receptor blocker like telmisartan (40 to 80 mg a day) to achieve good results. This drug also has additional, potential benefits for vascular health.

However, in general the best strategy for control of hypertension is the use of low doses of several different classes (different mechanisms of action) of medications.

**Natural Approaches to Blood Pressure Control**

In addition to, or in lieu of prescription drugs, several natural compounds are available that not only help lower blood pressure but help keep it down around the clock. Each compound has a different but complementary mechanism of action:

- **Flavonoids** block a receptor for the angiotensin hormone that can elevate blood pressure.
- **Stevioside** slows calcium signaling in order to relax blood vessels.
- **Time-release melatonin** provides control over nighttime blood pressure elevations.

These compounds work by multiple, clinically validated mechanisms to control blood pressure both day and night to maximally lower the risks of blood pressure-related health problems. Let’s look at each individually.
Blocking Angiotensin II

Quercetin, myricitrin, and myricetin are flavonoid molecules found in small amounts in a variety of plant foods.\textsuperscript{11,12} These flavonoids have been shown to help block the receptor for angiotensin II,\textsuperscript{13} which is a hormone that triggers the constriction (narrowing) of arteries.\textsuperscript{14}

Much like a finger over a garden hose, the narrowing of arteries raises pressure within them. Thus, blocking the angiotensin receptors is an effective way of bringing down blood pressure by helping to relax the arteries.

In addition to controlling high blood pressure, angiotensin receptor blockers have numerous other benefits, including enhancing insulin sensitivity, increasing the utilization of fat as energy, and improving mitochondrial function.\textsuperscript{15-17}

Experimental studies using assessment of receptor docking (i.e. the ability of a molecule to bind to a receptor) suggest that both quercetin and myricetin are effective at blocking angiotensin II receptors.\textsuperscript{18} Life Extension has recommended a class of drugs called angiotensin receptor II blockers for antihypertensive management over the past several years given the typically good tolerability and efficacy of this drug class.

A lab study demonstrated that myricetin inhibited the arterial contracting response to angiotensin by 43% compared with the natural condition—an effect that significantly reduced systolic blood pressure in hypertensive rats.\textsuperscript{18}

The Truth About Blood Pressure

- High blood pressure is a “silent killer” that results in long-term organ damage, cardiovascular disease, and death.
- A recent New England Journal of Medicine study supports Life Extension’s longstanding recommendation that target systolic blood pressure should be below 120 mmHg.
- This study showed that people whose systolic pressures remained near 120 mmHg had significantly better health outcomes than those in the 140 mmHg range.
- While prescription drugs remain the mainstay of antihypertensive therapy, natural products offer significant support in the struggle to control blood pressure.
- The flavonoids quercetin, myricitrin, and myricetin have molecular properties similar to angiotensin-blocking drugs and have been scientifically proven to be effective at lowering systolic blood pressure.
- Stevioside blocks calcium channels in vascular smooth muscle cells, emulating the actions of prescription calcium channel-blocking drugs and effectively lowering blood pressure.
- Melatonin provides superior nocturnal blood pressure control when used in its time-release formulation, helping provide around-the-clock protection.
Multiple clinical studies have demonstrated quercetin’s and myricitrin’s blood pressure-lowering effects in humans as well. In both healthy adults and in those who were overweight or obese, 150 mg a day of quercetin significantly reduced systolic blood pressure compared with subjects’ baseline values or with placebo.27-29

And in those with “prehypertension” and early hypertension (both conditions should be treated, according to the latest New England Journal of Medicine results), one study found that 162 mg a day of quercetin reduced systolic blood pressure by 3.9 mmHg compared to a placebo,21 and a second study showed that 730 mg a day of quercetin reduced systolic and diastolic blood pressure by 7 mmHg and 5 mmHg respectively compared with baseline values.22

Quercetin and myricitrin have also been found to lower blood pressure in type II diabetics, a population that is at an especially high risk for hypertension, as a result of complications from the disease. In women with type II diabetes, 500 mg a day of quercetin lowered systolic pressure by 5.3 mmHg compared with a placebo.23 And 600 mg a day of leaf powder from myricitrin-containing extract produced an 11 mmHg decrease in systolic blood pressure compared with baseline!24

Studies reveal that the stevia plant has an even sweeter benefit: it naturally lowers blood pressure. Stevioside blocks calcium channels in the smooth muscle cells of the arteries.27-29 When intracellular calcium levels rise, it causes the cells to constrict, which narrows arteries and increases blood pressure. Thus, blocking calcium channels is a distinct—and extremely effective—means of reducing blood pressure.

Calcium channel-blocking medications are a reliable means of lowering blood pressure, and are often used in combination with angiotensin II receptor blockers (ARBs). In the same way, combining stevioside with flavonoids such as quercetin, myricitrin, and myricetin provides a similar dual mechanism of action.

Numerous studies demonstrate stevioside’s blood pressure-lowering effects. A meta-analysis published in 2015 included data from 788 patients taking doses of stevioside ranging from 750 to 1,500 mg a day.30 Individuals supplementing with stevioside demonstrated a decrease in systolic blood pressure of 4.5 mmHg in all studies. And, among studies in which supplementation was continued for a year or longer, the mean reduction was an impressive 11.9 mmHg.

Nighttime Blood Pressure Control

Lowering high blood pressure is critical, but providing an around-the-clock blood pressure-lowering effect is equally important.

Melatonin is a hormone intimately involved with regulating the human circadian rhythm, or day/night cycle. It has multiple effects both in the brain and in the body as a whole that include reduction of nighttime blood pressure.31-33 This is an essential feature for the 35% of “non-dippers” with hypertension.

Melatonin receptors lower blood pressure by dilating (opening) blood vessels34 and by inhibiting signals from the sympathetic nervous system (the “Fight or Flight” reflex).34,35 Animal studies show that melatonin can reverse the elevated blood pressure induced by high-fat and high-salt diets, while also reducing other manifestations of metabolic syndrome. It also protects the kidneys and other organs from the long-term consequences of elevated blood pressure.36-38

But not all melatonin is equally effective in its blood pressure benefits. A meta-analysis report on 7 studies involving 211 total subjects evaluated the difference between immediate-release melatonin formulations (5 mg a day) and controlled-release melatonin formulations (ranging from 2-3 mg a day).32

What these studies found was that controlled-release melatonin in particular was most effective at controlling nighttime blood pressure. Only controlled-release melatonin had significant effects on systolic
blood pressure, reducing it by an average of 6.1 mmHg, while immediate-release melatonin produced only an insignificant 0.3 mmHg reduction. Controlled-release melatonin also lowered diastolic blood pressure significantly by an average of 3.5 mmHg, while the immediate-release formulation lowered diastolic pressures by just 0.2 mmHg.32

Summary

High blood pressure is a “silent killer,” producing no symptoms in most victims, while causing severe and often irreversible damage to blood vessels and the major organs they serve. A recent study supports what Life Extension has been saying for decades: that ideal systolic blood pressure targets should be under 120 mmHg—far below the 140 mmHg target maintained by mainstream medicine.

Natural compounds have been identified that work in similar ways as two classes of antihypertensive drugs—while also providing nighttime blood pressure relief.

The flavonoids quercetin, myricitrin, and myricetin bind to angiotensin receptors, preventing a rise in blood pressure. Stevioside blocks calcium channels in arterial wall smooth muscle, allowing vessels to relax and reducing blood pressure. And melatonin, only in time-release form, eases nighttime blood pressure to complete the cycle of protection.

These natural compounds can form part of the plan for everyone with systolic blood pressure readings of 120 mmHg or higher.

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

References


Blood Pressure Recommendations

For most aging individuals, Life Extension recommends an optimal blood pressure goal of 115/75 mmHg. However, those aging individuals with long-standing hypertension and/or coronary artery disease, individuals with kidney disease, and those over 80 years of age should be aware that a rapid, overly-aggressive reduction of blood pressure should be avoided. Signs of overly aggressive blood pressure reduction may include worsening cognitive function, dizziness and/or lightheadedness when standing quickly from a sitting position, and worsening biomarkers of kidney function.

Regrettably, some older, fragile patients may simply not tolerate a target blood pressure of 115/75 mmHg due to long standing damage to the vascular system, thus requiring a higher perfusion pressure to meet physiologic demands. In these fragile patients, maintaining the lowest blood pressure tolerated is reasonable.

Life Extension recommends frequent blood testing of kidney function biomarkers like BUN and creatinine when embarking on an aggressive blood pressure control program. Also, Life Extension strongly recommends that all people purchase a low-cost at-home blood pressure monitor so they can check themselves when trying new medications or nutrients.


30. Onakpoya IJ, Heneghan CJ. Facts about Hypertension

Elevated blood pressure (hypertension) has long been known as the “silent killer,” because it produces no symptoms at all in the vast majority of victims, while causing severe and often irreversible damage to blood vessels and the major organs they serve.

About 70 million Americans have blood pressure of 140/90 mmHg or above, which defines hypertension according to mainstream medicine.40,41

Even more American adults, about 1 in 3, have so-called “prehypertension,” which is clinically defined as blood pressure between 120/80 mmHg and 139/89 mmHg.40,42

Sadly, despite the known risks, only about half of those with high blood pressure have their condition under control even by the standard definitions of hypertension.39 Given that estimates of “prehypertension” range from 25% to 50% of the population,43 the real number of people with dangerously high blood pressure is probably much higher.

All of this means two things: In addition to getting regular blood pressure measurements, it is critical to get systolic blood pressure down to less than 120 mmHg, optimally at 115/75 mmHg.
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Scientists continue to find healthy benefits—including DNA protection—in cruciferous plants. But it’s not always easy to get in five servings of cruciferous vegetables a day—and even if you do, cooking can destroy many of the protective compounds found in broccoli, Brussels sprouts, cauliflower, and cabbage.

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Triple Action Blood Pressure AM/PM is formulated with myricetin and quercetin flavonoids along with steviosides to support a healthy 24-hour blood pressure cycle.

Suggested dose is one tablet in the morning and one tablet 30-60 minutes before bedtime. This formula is available with or without time release (2 mg) melatonin.

Also available, Dual Action Blood Pressure Support (without melatonin). Item# 02025.

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CAUTION: Consult your healthcare provider before use if you are taking medication or are being treated for a medical condition. Do not use if under the age of 18, pregnant, lactating, or trying to become pregnant. After taking the PM tablet, do not attempt to drive or operate heavy machinery and use caution if combining with alcohol. This product is not intended to replace anti-hypertensive medications your doctor may have prescribed.

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If you’re having trouble falling asleep, you’re not alone. An estimated 50 to 70 million American adults suffer from chronic sleep deprivation—a problem that only worsens with advancing age.\(^1\)\(^3\) The situation is so significant that the Institute of Medicine referred to insufficient sleep as “an unmet public health problem.”\(^1\) That was a decade ago. With current estimates claiming that half the US population will suffer from a sleep disorder during their lifetime,\(^4\) the situation isn’t much better today.

Research shows that insufficient sleep increases the risk for numerous deadly conditions—such as heart attack, stroke, diabetes, and hypertension—and can even lead to shorter lifespans.\(^1,2,5\)

There is a high demand for drugs that provide relief. But while prescription sleep aids can work for a while, they come with a long list of side effects that impact quality of life—and many are highly addictive.\(^6\) Adding to the list of concerns are the findings of a recent study on the increased risk of premature mortality associated with use of these drugs.\(^7\)

There are natural compounds that have been shown to help enhance sleep and alleviate the anxiety that can be an underlying cause.
Can become habit forming, bioactive milk peptides induce relaxation and sleep without the side effects.\(^24\) Animal studies show that, while bioactive milk peptides produce the same anti-anxiety effects as Valium, they don’t produce the “disinhibition” that can lead to risk-taking behavior associated with such drugs.\(^24\)

These encouraging results have been seen in human studies as well. For example, a group of women experiencing stress-related symptoms such as anxiety, sleep problems, and general fatigue were given bioactive milk peptides (150 mg a day) or a placebo.\(^25\) After 30 days, the supplemented women experienced significant improvements compared to the placebo in symptoms related to digestion (65.6% improvement), cardiovascular function (48.9% improvement), cognitive function (62.5% improvement), and social difficulty (40.2% improvement).

In addition to improving sleep and reducing stress, bioactive milk peptides reduce many of the underlying biomarkers associated with the stress response, including elevated blood pressure, heart rate, and cortisol.\(^26,27\)

Ashwagandha

Anxiety is a common cause of insomnia, and insomnia can lead to further anxiety. Ashwagandha (Withania somnifera), a medicinal herb with long-standing, widespread use in ancient medical systems, can play an important role in breaking up this vicious cycle.

### Causes and Impact of Poor Sleep

Poor sleep quality has a far greater impact on our bodies than simply making us feel fatigued. It can affect endurance,\(^8\) contribute to weight gain,\(^9\) and lead to an increase in fine lines and wrinkles.\(^10\) Sleep disorders also have profound physiological consequences that contribute to long-term health risks, and even to shorter lifespans.

And sleep deprivation has been associated with accelerated aging. This was seen in a study showing that middle-aged men that sleep 5 hours or less had on average 6% shorter telomeres compared to those sleeping more than 7 hours.\(^11\) Telomeres are the “caps” on chromosomes that gradually shorten with time, and may represent a kind of “fuse” that indicates biological aging.

Stress, anxiety, and depression are common symptoms present in individuals experiencing chronic insomnia, because they negatively affect circadian rhythms and modify both sleep duration and sleep quality.\(^12-17\) Virtually everyone who suffers from sleep disorders reports increased stress and anxiety in their lives.\(^18,19\) Stress can set in motion a host of biochemical changes that culminate in a vicious cycle which leads to poor sleep, which leads to greater stress.\(^20\)

Because of the tremendous impact stress has on sleep, any remedy for poor sleep should include components that also help to lower anxiety and relieve stress. There are non-drug approaches that have been found to promote sleep, while helping alleviate anxiety and stress. Let’s examine each compound individually.

### Bioactive Milk Peptides

Nutrients found in milk called bioactive milk peptides (chains of amino acids) have been found to enhance sleep quality, shorten the time to get to sleep, and reduce daytime dysfunction.\(^21\) Importantly, they have also been shown to simultaneously produce a calming, sedative effect that helps combat anxiety. Researchers discovered that bioactive milk peptides activate brain cell receptors for neurotransmitters that reduce anxiety, such as GABA, serotonin, and dopamine.\(^22,23\)

The ability to activate GABA receptors in the brain is one reason the anti-anxiety drugs in the benzodiazepine class (think Valium, Ativan, and others) are so effective.\(^22\) The advantage of milk peptides is that unlike benzodiazepine drugs, which
Ashwagandha is an *adaptogen*, a compound that induces physiological balance in the body and reduces the impacts of stress. Its uses have included targets such as cancer, infection, immunomodulation, and neurodegenerative disorders. Studies also show that it has a beneficial impact on anxiety, stress, and insomnia. In fact, “*somnifera*” from its scientific name in Latin means “sleep-inducer.”

Ashwagandha has numerous constituents that are showing anti-anxiety properties. In a human study of adults with a history of chronic stress, taking 300 mg of ashwagandha twice daily for 60 days led to a significant reduction in scores on stress-assessment scales. Impressively, those taking ashwagandha also had a highly significant reduction in blood levels of the stress hormone cortisol during the treatment period.

In addition to combating chronic stress itself, ashwagandha combats some of its side effects. In a study of people facing chronic stress, supplementation with ashwagandha led to significant improvements in perceived stress, food cravings, and happiness. The subjects also experienced significant reductions in serum cortisol, body weight, and body mass index. These findings are especially important in light of the known weight-gain effects of stress and anxiety—particularly in those who use food to “self-medicate.”

As an added benefit, animal studies show that ashwagandha protects the brain from some of the harmful behavioral and biochemical effects of sleep deprivation, such as impaired locomotor activity, and impaired learning and memory.

**What You Need to Know**

**Restoring Youthful Sleep**

- Chronic poor sleep affects more than 70 million Americans.
- Stress is both a cause and a consequence of poor sleep, and is a major long-term health threat.
- Mainstream medicine’s anti-stress and sleep-inducing drugs are effective but carry an appalling array of side effects.
- The natural substances melatonin, bioactive milk peptides, and ashwagandha extracts all contribute in different ways to enhancing sleep and relieving stress.
- Together, these nutrients work to normalize disrupted day/night cycles, relieve anxiety, and help our bodies cope with stress.
- Those with sleep difficulties should add these soothing, anxiety-relieving, and sleep-promoting nutrients to their bedtime regimens.
Melatonin and Prescription Drugs

There’s no doubt that melatonin is effective in helping otherwise healthy people fall asleep, sleep better, and awake refreshed.50 But the real test of melatonin’s sleep-improving properties is to determine its effectiveness in people who have chronic sleep-impairing conditions, or in those taking drugs that impair sleep. Melatonin has passed that test.

For example, drugs known as beta blockers are used for cardiovascular disease by more than 22 million people in the US. One of the problems with these drugs is that they suppress natural nighttime melatonin secretion, which produces the common side effect of insomnia.51 Researchers decided to put supplemental melatonin to the test in this challenging group of subjects.

For the study, middle-aged men and women taking beta blockers received either 2.5 mg of melatonin or a placebo nightly for three weeks. Researchers found that the supplemented subjects had significantly greater total sleep time (+36 minutes), a shorter time to fall asleep (-14 minutes), and they increased their sleep efficiency by 7.6%, compared with placebo recipients.51

Similarly, people who have survived cancer or other potentially fatal disorders often have sleep disturbances that last for years. Melatonin has been found to be useful in this group of people as well. In a study of postmenopausal breast cancer survivors, 52% reported poor sleep in the month before the study. But those...
taking 3 mg of melatonin daily had significant improvements in overall sleep quality and daytime dysfunction, compared with placebo recipients. Melatonin is also beneficial in postmenopausal women, a group known for suffering from sleep problems. A study showed that a daily 5 mg dose of melatonin significantly improved sleep quality in healthy menopausal women, and produced significant reductions in body weight, which is an important contributor not only to insomnia, but to other health risks as well.

For many people who rely on anti-anxiety medication such as Valium or Xanax to fall asleep, it is important to note that the use of these medications can suppress melatonin levels. According to one study, a single dose of alprazolam (Xanax) dramatically suppressed the body’s natural nocturnal melatonin rise, thereby making it more difficult to achieve natural sleep and making individuals more dependent on the medication for sleep.

Recently, scientists have begun studying the use of melatonin as a way to reduce dependence on benzodiazepine drugs by people suffering from insomnia. This points up the importance of avoiding the use of commonly available, highly addictive sleep medications in favor of melatonin for preserving our natural sleep cycles.

**Summary**

Stress leads to insomnia, and poor sleep induces yet more stress in a vicious circle of misery. Sleep problems worsen as we age, are exacerbated by many chronic and acute diseases, and raise our risk for long-term serious illness. There’s even evidence that poor sleep has an effect on our chromosomal telomeres, shortening them (and thus our lives) prematurely.

Prescription and over-the-counter sleep aids can be effective, but the majority of them have side effects, including the potential for dependence and tolerance (where they stop working).

Fortunately, long-revered natural products continue to demonstrate the ability to enhance sleep and alleviate stress, while also protecting against the harmful effects of stress and sleep deprivation.

Melatonin helps reset our sleep-wake cycles and promotes better, more effective sleep. Bioactive milk peptides and ashwagandha both help relieve the stress that can impair sleep, and they also contribute directly to sleep quality and quantity.

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References


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Arianna Huffington
author of
The Sleep Revolution
Doctors say getting a solid night’s sleep is an important component of maintaining good health. Your body restores its immune system during sleep, and insufficient sleep has been linked to a number of serious health woes, including heart disease, diabetes, being overweight, problems with memory and fuzzy thinking as well as lower levels of testosterone in men.

Writer Arianna Huffington, the co-founder and former editor-in-chief of the popular news website The Huffington Post, believes we’re in the midst of a sleep-deficit crisis, something she knows about from personal experience. Beginning in her years as a college student, Arianna says she bought into “the prevalent cultural norm of sleep deprivation as essential to achievement and success.” She continued on this dangerous path for years, pushing herself to get by on just three or four hours of sleep a night, until eventually, in April 2007, she collapsed from “sleep deprivation, exhaustion, and burnout.”

After learning her lesson, and seeing that too many people suffer from lack of sleep in today’s fast-paced, stress-filled world, Arianna felt moved to write The Sleep Revolution: Transforming Your Life, One Night at a Time.

In this interview with Life Extension®, Huffington discusses the importance of getting quality sleep, as well as the detrimental effects of sleeping pills.

“Other studies have found sleep quality improved in a room scented with lavender.”
“fatigue-related adverse events” increased by 700% and “fatigue-related adverse events” resulting in patient death increased by 300%. An Australian study found that after being awake for 17 to 19 hours (a normal day for many of us!), we can experience levels of cognitive impairment equal to having a blood alcohol level of .05% (just under the legal limit in many US states). And if we’re awake just a few hours more, we’re up to the equivalent of .1%—legally drunk.

LE: How common is the use of prescription sleeping pills?

AH: In the United States, more than 55 million prescriptions for sleeping pills were written just in 2014, with sales topping $1 billion. A 2013 Centers for Disease Control (CDC) report stated that 9 million Americans—4% of all adults—use prescription sleeping pills. I asked several sleep experts what they thought of the 4% number from the CDC, and the general conclusion was that the survey number involved significant underreporting. A National Sleep Foundation poll found startlingly high rates of sleep-aid usage among women, with 29% reporting that they use a sleep aid of some kind at least a few nights a week. A survey by Parade magazine of more than 15,000 people found that 23% of respondents took sleeping pills once a week and 14% took them every night.

LE: What about the effects of lack of sleep on behavior and mental ability?

AH: Researchers from Harvard Medical School and Brigham and Women’s Hospital examined the effects of sleep deprivation on nearly 3,000 first-year (medical school) residents. The number of hours an intern may work per week is capped at 80 hours, but individual shifts can run more than 24 hours. They found that in months when interns worked five or more shifts longer than 24 hours, of sleep-aid usage among women, with 29% reporting that they use a sleep aid of some kind at least a few nights a week. A survey by Parade magazine of more than 15,000 people found that 23% of respondents took sleeping pills once a week and 14% took them every night.

LE: What about the effects of lack of sleep on behavior and mental ability?

AH: The most common pharmaceutical weapon we use to knock ourselves out is the drug zolpidem, which you probably know as Ambien. It accounts for more than two-thirds of the sleeping pills sold in the United States. Zolpidem is part of a class of drugs known as hypnotics, which work to induce and lengthen the duration of sleep. Lunesta, another hypnotic, marketed with a seductive green butterfly logo, had more than $350 million in sales in the United States in 2014, and that figure does not include the generic version, eszopiclone, which generated another $43 million.
LE: How effective are these drugs? Are they actually helpful?

AH: When you hear the stories of people who have become dependent on sleeping pills, you realize they shouldn’t be called sleeping pills at all. Because we now know that simply not being awake doesn’t necessarily mean you’re actually asleep.

Harvard Medical School professor Patrick Fuller explained to me the difference between natural sleep and drug-induced sleep. Sleeping pills typically target only one of the many different chemical systems used by the brain as part of the sleep process, which “necessarily produces an imbalance in the chemical signaling by which the brain achieves normal sleep and may limit restorative slow-wave sleep. The newer drugs like Ambien produce more naturalistic sleep but can have side effects, albeit rarely, like sleep eating and sleepwalking, which by definition are not part of normal sleep behavior.”

This limbo state, when we are not really awake but not really asleep, can result in behaviors ranging from the harmless and humorous to the disturbing and dangerous. And part of the danger is that you will more than likely have no memory of whatever you do.

LE: Are there any long-term hazards involved with sleeping pills?

AH: Researchers from the University of Montreal and the University of Bordeaux discovered that the use of benzodiazepines such as Xanax and Restoril, usually taken for anxiety or as a sleep aid, increases the risk of developing Alzheimer’s by 32% after being used for three to six months. Taking these drugs for more than six months raises the risk by 84%.

LE: What about people who are just occasional users?

AH: One study from the Scripps Research Institute led by Dr. Daniel Kripke compared data from a sample group of more than 10,000 people taking sleeping pills, including zolpidem (Ambien) and temazepam (Restoril), with a control group of more than 23,000 not taking sleeping pills. Researchers found that those prescribed as few as 18 doses of sleeping pills a year had a three-times-higher risk of death during the study’s two-and-a-half-year follow-up period than their counterparts in the control group, “with greater mortality associated with greater dosage prescribed.” Furthermore, those taking the highest dosage of sleeping pills (more than 132 doses per year) had a 35% increased risk of cancer—including lung, lymphoma, prostate, and colon cancers.

LE: Can you discuss some natural sleep-aid supplements that you would recommend?

AH: Those who want to explore herbal sleep aids—and especially those who want to wean themselves off sleeping pills—have many options to consider. Valerian root, for example, is a natural sedative whose use dates back to ancient Greece, where Hippocrates prescribed it in the fourth century B.C. In recent years, its effectiveness has been supported by research. In addition to valerian root, Dr. Frank Lipman, founder of the Eleven Eleven Wellness Center in New York, also recommends other nutrients that can improve sleep, including gamma-aminobutyric acid, or GABA (a naturally occurring chemical that dampens brain activity), and L-theanine (an amino acid found in green tea leaves that induces brain waves connected to relaxation).

LE: Is there anything else you would like to share about natural sleep aids?

AH: When it comes to natural sleep aids, it’s important to remember that they are not a substitute for a healthy lifestyle, including proper nutrition, regular exercise, and adequate sunlight exposure. Additionally, if you experience any side effects or if your sleep quality doesn’t improve after trying a natural aid for a reasonable amount of time, it’s always a good idea to consult with a healthcare professional.
LE: Lastly, do you have a bedtime routine that helps you get a good night’s sleep?

AH: I treat my transition to sleep as a sacrosanct ritual. Before bed, I take a hot bath with Epsom salts and a candle flickering nearby—a bath that I prolong if I’m feeling anxious or worried about something. I don’t sleep in my workout clothes as I used to (think of the mixed message that sends to our brains) but have pajamas, nightdresses, even T-shirts dedicated to sleep. Sometimes I have a cup of chamomile or lavender tea if I want something warm and comforting before going to bed. Think of each stage as designed to help you shed more of your daytime worries.

LE: What is the most widely-used natural sleep aid today?

AH: One of the most popular herbs for sleep is lavender, which has been used throughout history for healing and relaxation. The Greek physician Dioscorides wrote about lavender’s many medicinal benefits as early as the first century. The herb was a staple of Greek and Roman baths, and in ancient Egypt it was frequently used for incense. And again, there is scientific evidence to support what the ancients knew. A Thai study found that smelling lavender helps us relax by slowing down our heart rate, decreasing our blood pressure, and lowering skin temperature. Other studies have found sleep quality improved in a room scented with lavender or when lavender oil was sprinkled on pajamas or pillows. And in Germany, lavender tea has been approved by their equivalent of the FDA as a treatment for insomnia.

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Natural Plant Extracts Combat Aging, Drooping Eyelids

The thin skin of the eyelids is highly sensitive to external stressors like sun exposure and environmental pollutants.\(^1\)\(^-\)\(^3\)

Internal changes such as the formation of advanced glycation end products further accelerate aging of functional skin proteins in collagen and elastin.\(^4\)\(^-\)\(^5\) The resulting formation of cross-links in elastin and collagen reduces their flexibility and elasticity, and increases tissue stiffening.\(^6\)\(^-\)\(^7\)

This compromised collagen and elastin structural network produces a tired and worn out appearance—often accompanied by unsightly drooping eyelids, dark circles, and bags that make one look older.

Fortunately, natural plant extracts have been identified that offer a unique advantage by boosting the formation of collagen and elastin, while protecting existing skin proteins from glycation and enzymatic degradation.
**Albizia julibrissin Extract**

*Albizia julibrissin*, also known as Persian silk tree, is a plant indigenous to southwestern and eastern Asia. Its cluster of pink flowers has been historically used to treat anxiety and depression in Chinese traditional medicine due to its ability to elevate mood and restore calm in the face of stress.8,9

There has been a great deal of cosmetic interest in *Albizia julibrissin* extract, and for good reason. Its free-radical scavenging power—six-fold greater than vitamin C—thwarts free-radical assaults that result in damaged and aging eyelids.10,11

**Siegesbeckia orientalis Extract**

For centuries, natives of India have used *Siegesbeckia orientalis* to treat and reduce the risk of inflammatory diseases. Now research is catching up to this traditional wisdom as one of this plant’s main constituents—*kireno*—has been shown to quell local and systemic inflammation through suppression of nuclear factor-kappaB activation, which in turn blocks the production of pro-inflammatory mediators.12,13

**A Powerful Combination**

In vitro studies combining both *Albizia julibrissin* and *Siegesbeckia orientalis* extracts have been shown to inhibit free-radical production by 37% and reduce lipid peroxidation by 81% in human skin fibroblasts.14

Additionally, the combination of the extracts decreased elastin *glycation* by 21% after 9 days in human fibroblasts exposed to fructose. This combination of nutrients was shown to protect against advanced glycation end products, prevent the formation of damaging *glycotoxins* that contribute to dark circles, and reduce the accumulation of the pigment *lipofuscin* responsible for light brown, yellowish age spots.14

There is also evidence that the two plant extracts, when exposed to human fibroblast cells of connective tissue, may strengthen the dermis by an impressive 229%, and increase elastin and collagen synthesis by 256%.14

**Human Studies**

In human studies, extracts of *Albizia julibrissin* and *Siegesbeckia orientalis* improve characteristics of aging around the eyes, including crow’s feet, drooping eyelids, and dark circles.

Scientists applied a cream containing either both plant extracts or a placebo twice daily to the crow’s feet of 24 volunteers aged 40-79. After two months, the volume and depth of wrinkles diminished by an average of 14.1% and 9.5%, respectively. They also observed an 11.2% increase in the opening of the wrinkles, thereby making them less pronounced.14

Next, scientists retained 18 volunteers with drooping upper eyelids from this study and applied the same protocol. Participants experienced a 20.4% decrease in height of the fold of the eyes, and a 13.7% reduction in drooping surface area. At the end of two months, 94% of participants demonstrated a visible lifting effect on the upper eyelid.14

In another controlled clinical study with 24 participants (mean age 42), twice daily application for two months of a cream containing both plant extracts was shown to reduce dark circles under the eyes by 7.5%, whereas a placebo cream increased them by an approximate 2.8%.14

Researchers evaluated the self-assessment scores of 105 volunteers reporting a tired look characterized by dark circles, wrinkles, and puffiness. Compared to a placebo, participants applying a cream containing both plant extracts reported the following significant improvements after 28 days:14

- 44% reduction in the fatigue appearance of the eye area
- Approximate 42% reduction in wrinkles and puffiness
- Close to a 46% reduction in dark circles

---

**Albizia julibrissin**
What You Need to Know

NATURAL PLANT EXTRACTS COMBAT AGING, DROOPING EYELIDS

Olive Oil Extract

The benefits of olive oil for skin health have been seen after both local (topical) and systemic (oral) administration. Olive oil is a well-known component of the Mediterranean diet that safeguards against numerous age-related diseases. As a rich source of monounsaturated fatty acids, olive oil reduces the risk of photoaged skin characterized by saggy and droopy eyelids, wrinkles, and undesirable pigmentation. Furthermore, olive oil's main phenolic compound—oleuropein—supports the skin’s healing mechanisms, especially in the delicate area of the eyelids.

Seaweed Extract

Chondrus crispus—a species of red seaweed found along the rocky coasts of the Atlantic—has unique properties that can bind and trap water molecules, thereby effectively rehydrating different layers of eyelid skin. It’s chock full of vitamins, minerals, and phytonutrients that help repair sun-damaged skin to leave it smoother and more radiant.

Plant Extracts Revitalize Aging Eyelids

- The thin and delicate skin of the eyelids is sensitive to both external and internal stressors such as ultraviolet radiation, environmental pollutants, and advanced glycation end products (AGEs).
- As a result, the skin’s structural network of collagen and elastin becomes compromised—leading to drooping eyelids, dark circles, and bags that make you look much older than you really are.
- Albizia julibrissin and Siegesbeckia orientalis extracts have been shown to protect against destructive glycation and stimulate collagen and elastin production.
- Human studies have demonstrated that both plant extracts reduce drooping upper eyelids, dark circles, and crow’s feet.
- Seaweed and olive oil extracts provide remarkable moisturizing and nourishing properties to keep eyelid skin firm and supple.
- Together, these natural plant extracts offer a potent formula for rejuvenating aging, drooping eyelids.

Summary

The daily assault of external and internal factors such as ultraviolet radiation and formation of advanced glycation end products takes a heavy toll on the thin skin of the eyelids. This weakens the skin’s structural network of collagen and elastin—paving the way for the development of dark circles and bags under the eyes, as well as drooping eyelids that can add years to your perceived age.
Scientists have identified natural plant extracts—including *Albizia julibrissin* and *Siegesbeckia orientalis*—that work together to stimulate collagen and elastin synthesis. These topical compounds, combined with the moisturizing and nourishing properties of seaweed and olive oil extracts, offer a potent formula for rejuvenating aging eyelids.

Gary Goldfaden, MD, is a clinical dermatologist and lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology in Hollywood, FL, and Cosmesis Skin Care. Dr. Goldfaden is a member of Life Extension®’s Medical Advisory Board. All Cosmesis products are available online.

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

As skin ages, it loses suppleness and smoothness. A prime reason is loss of ceramides that are required for skin to retain its moisture.

Skin Restoring Phytoceramides contains wheat-derived ceramide oils in an oral capsule that hydrates the deepest dermal layers to nourish the entire body’s skin.

Restoring Youthful-Looking Skin from the Inside Out

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Combat Unsightly Veins

European Leg Solution with certified Diosmin 95 helps your legs look and feel great by:1-4

- Supporting healthy blood flow.
- Maintaining healthy venous tone and elasticity.
- Safeguarding collagen suppleness.

European Leg Solution featuring Certified Diosmin 95
Item #01042 • 30 vegetarian tablets

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To order European Leg Solution featuring Certified Diosmin 95, call 1-800-544-4440 or visit www.LifeExtension.com

References

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Eye Lift in a Jar

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The four unique bioactive extracts in Cosmesis Eye Lift Cream reduce the appearance of sagging, dark circles, bags, and wrinkles.

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Keep out of reach of children. For external use only. Avoid contact with eyes. If product contacts eyes, rinse thoroughly with water. If rash or irritation occurs, please discontinue use.
INCREASE SKELETAL STRENGTH AND BOOST BONE DENSITY

It takes more than calcium to build strong bones...a host of skeletal-promoting nutrients are needed. Bone Restore supplies a highly absorbable form of calcium in a combination of critical bone-building compounds:

- Boron,
- Vitamin D₃,
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- Vitamin K₂ (long-acting MK-7 form).

Vitamin K₂ is essential to maintain skeletal integrity.

Bone Restore with Vitamin K₂
Item #01727 • 120 capsules

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Bone Restore without Vitamin K
For those taking Super K or Health Booster, additional vitamin K₂ is not needed. Bone Restore (without vitamin K) is available as Item #01726 at a slightly lower price.

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“TURN ON” Your Body’s Longevity Genes!

Support longevity factors in four different ways:

- **Trans-Resveratrol** facilitates youthful gene expression.
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**Optimized Resveratrol with Nicotinamide Riboside**

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*Optimized Resveratrol with Nicotinamide Riboside provides 2.5 times the previous amount of quercetin.*

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Stem cells continuously replenish and repair many body tissues.

Red blood cells are replenished about every four months, skin cells are replenished in less than a month, and cells lining the small intestine are replaced every few days. The stem cells performing this function are called somatic stem cells. Somatic stem cells are important contributors to wound healing. The decline in somatic cell function with age might be one of the reasons why wounds heal more slowly, and with more scarring, as people grow older.

Somatic stem cells usually are only capable of becoming the type of cell found in the tissue where they reside. Some stem cells are multipotent, capable of differentiating into many types of cells. Notable examples include hematopoietic stem cells (HSCs) which can become any type of blood cell (red blood cells, white blood cells, or other immune-system cells) and mesenchymal stem cells (MSCs), which can differentiate into bone cells, fat cells, muscle cells, or cartilage cells.
Urgent Need to Accelerate Stem Cell Research

Although many scientists believe pluripotent stem cells (ESCs and iPSCs) hold great potential for regenerative medicine, it will probably be at least a decade before technologies are developed to safely and effectively expand and differentiate them. iPSCs are the most promising source of patient-specific pluripotent stem cells, yet iPSCs have many more genetic abnormalities than ESCs, and about ten times more mutations than the cells from which they were derived.15,16

It is essential to expand the number of stem cells in order to have sufficient quantity of those cells for therapy, but iPSCs are far more difficult than ESCs to expand without defects.16 It is likely that technologies developed in the coming decade will help overcome these limitations.

Fetal tissue is rich in stem cells, and those stem cells have a low risk of immune system rejection because HLA immaturity protects the fetus from immune rejection by the mother. Although fetal tissue has been used to treat a wide variety of diseases, low availability and ethical concerns constrain its use.17 Stem cells from umbilical cord blood have similar advantages, but also have limited availability.18

Regenerative Medicine

A dream of stem cell therapy is to only use stem cells that are HLA-compatible with the body tissue of the patient to prevent immune rejection, and to avoid the need to use drugs to suppress the immune system. Only stem cells that originate from the body of the patient receiving the treatment would fulfill that requirement. Such stem cells would be essential for regenerative medicine, allowing for the replacement or repair of any defective tissue or organ.

Embryonic stem cells (ESCs) isolated from a patient can differentiate into any type of cell needed by the patient (pluripotent). In 1998, human ESCs were first derived from human embryos only a few days old, but only by destroying the embryo.6 In 2006, however, a method was found to remove an ESC from an embryo without destroying the embryo.7 But that same year, Japanese researcher Shinya Yamanaka discovered a way of inducing mouse skin cells to become pluripotent as ESCs.8 The following year he was able to create similar induced pluripotent stem cells (iPSCs) from human skin cells.9 For these achievements, Dr. Yamanaka together with Sir John B. Gurdon won a Nobel Prize in 2012.

Much work remains to be done, however, to fulfill the hope that iPSCs represent. Human iPSCs take weeks to derive, efficiency is often as low as 0.1% and quality is often poor.10-12 Differentiating somatic cells from iPSCs is far from an exact science. Despite being derived from the patient for whom they are to be used, iPSCs can often produce an immune response due to poor quality.13 iPSCs become cancerous much more often than ESCs.14

Stem Cell Transplants

HSC transplantation has been performed for decades, but only for life-threatening conditions. Chemotherapy or radiation therapy against cancer can destroy bone marrow immune cells. So HSCs can be extracted from a patient before therapy and replaced after therapy. Often, however, it is necessary to use stem cells from another person, matched as closely as possible with compatible human leukocyte antigens (HLAs). Many different HLA proteins occur on the surface of cells, which vary considerably from person to person, and which are the major cause of immune system rejection associated with organs or tissues transplanted from one person to another. Even when well-HLA-matched sibling tissues are used, drugs to suppress the immune system are required.5

Hematopoietic Stem Cells (HSCs) are the most commonly used curative stem cell therapy in modern medicine,19 but MSCs are by far the most common type being tested in clinical trials.20 MSCs can be used without HLA matching because MSCs do not express a broad class of HLA antigens.21 Moreover, MSCs possess many anti-inflammatory properties, so MSCs have often been used to suppress the immune system after organ transplantation.22 Although MSCs were originally derived from bone marrow, MSCs can
now be derived from a wide variety of tissues and body fluids.23 The main benefit of MSCs is their ability to enhance the repair capabilities of tissues, rather than their ability to engraft (which is poor).24 A major challenge with MSCs is their wide cell-to-cell variability.25

Parabiosis experiments which connect the circulatory systems of genetically matched young and old mice have been shown to restore somatic stem cell function in the old mice.26 The Life Extension Foundation is seeking to raise funds for clinical trials with the hope of reversing frailty in elderly humans who are given extracts of young blood.

### References

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

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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

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Scientists formulated Cognitex® contains validated ingredients shown at two weeks to improve:

- Spatial short-term memory 42%
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- Visual learning 33%
- Activities of daily living by over 10%

* J Diet Suppl. 2011 Jun; 8(2):158-68

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

Suggested dose is one to two capsules daily.

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

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Boron is a critical nutrient—but it is not abundant in most diets.¹

Prostate Function
Research has shown that boron promotes healthy prostate function.²,³

Bone, Joint, and Brain Support
Boron supports the functions of calcium, magnesium, and vitamin D for promoting dense, healthy bone tissue.⁴ By regulating pro-inflammatory factors, boron may support joint health.⁵ Additional evidence suggests boron may help maintain normal brain function.⁶

Bioavailable Formulation
Life Extension® Boron contains a unique synergistic combination of three highly utilizable, 100% natural chelated sources: boron citrate, boron aspartate, and boron glycinate.

You May Already Be Obtaining Enough Boron
Life Extension® has long recognized the health benefits of obtaining sufficient daily boron. That’s why there are 3 mg of boron in the daily dose of each of the following formulas:

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- Ultra Natural Prostate
- Bone Restore
- Life Extension Mix™

The suggested daily dose for most adults is 6-9 mg of boron.⁷ If you are already obtaining this potency in your multi-nutrient formulas, you may not need additional boron. Certain individuals may want to supplement with up to 12 mg of boron each day.

References
Fast-Acting Joint Formula quickly promotes joint comfort and ease of motion. One capsule daily supplies:

- **300 mg** of *Cynatine® FLX* providing *solubilized keratin*, supplies cysteine to quickly rebuild vital joint tissue.
- **200 mg** of *Decursinol-50®* inhibits activation of NF-kB, associated with inflammation.
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In a new study, scientists have presented powerful evidence that vitamin K2 can reduce the progression of atherosclerosis, the “blockage” of the arteries that can lead to heart attacks and strokes.

This is tremendous news for the millions of Americans who are at risk for cardiovascular disease, which remains the number one killer in the US.¹

Scientists long ago learned that vitamin K2 plays a crucial role in activating proteins that help keep calcium where it belongs, in the bones, and out of blood vessels where it can cause problems.

Published data show that people with higher intake of vitamin K2 have a 57% reduction in the risk of dying from cardiovascular disease, and as much as an 81% reduction in non-vertebral fractures.²,³

Here, we’ll review the important new study on atherosclerosis, and then examine previous findings that explain how vitamin K2 contributes so importantly to both cardiovascular and bone health in aging adults.
Vitamin K2 Reduces the Progression of Arterial Thickening

Numerous studies have demonstrated that people with higher intakes of vitamin K2 have a reduced risk for cardiovascular disease. Intrigued by this connection, Polish researchers from the Medical University at Lodz teamed up with researchers from Maastricht University in the Netherlands and Poland’s International Science and Health Foundation to determine if vitamin K2 supplementation could reduce the progression of existing atherosclerosis.

The scientists evaluated the progression of atherosclerosis in a group of 42 patients with chronic kidney disease. These patients were ideal for this type of study because they are known to experience a rapid reduction in bone mineral density (a measure of bone strength) as a result of calcium losses from bone. They are also subject to equally excessive deposits of calcium in tissues where it doesn’t belong—particularly in the walls of major arteries.

For the study, the subjects were divided into two groups. One group received vitamin K2 (90 mcg per day) plus vitamin D3 (400 IU per day). The second group received only vitamin D3 (400 IU per day).

After nine months, it was already evident that the subjects taking the combination of vitamins K2 and D3 experienced a slower progression of the Common Carotid Intima Media Thickness, which is a good indicator of atherosclerosis, as well as a predictor of cardiovascular episodes and death. Specifically, the thickness of the carotid (major neck) arteries increased by 13.73% in the group taking vitamin D3, but in the group taking both vitamins, it only increased by 6.32%.

Remember that the group of subjects in this study have a tendency for an increased carotid intima media thickness as a result of calcium losses from bone. In addition, subjects taking the combination of vitamins K2 and D3 showed a reduction in carotid artery calcification score in all patients except those with the highest scores at baseline. This indicates that calcium was staying in the bones, where it belongs, and out of the arteries.

These results clearly indicated that vitamin K2 does indeed reduce the progression of atherosclerosis.
How It Works

The impact of vitamin K2 on atherosclerosis is due to its role in activating a group of proteins whose job it is to keep calcium in the bones and out of the arteries.\(^3\,^5\,^9\)

In bones, vitamin K2 activates a specific protein called **osteocalcin**. When osteocalcin is activated by vitamin K2, it binds calcium tightly to bone minerals to create strong bones. In arteries, vitamin K2 activates a protein called **matrix Gla protein**. When matrix Gla protein is activated by vitamin K2, it prevents calcium from being deposited in arteries.\(^9\,^{10}\)

When vitamin K2 is not present in sufficient enough quantities to activate these two proteins, the result is an increased risk for developing osteoporosis and atherosclerosis because of calcium loss from the bones.\(^11\,^{13}\)

Vitamin K2’s Dual Benefits

The recent Polish study further validated previous studies demonstrating vitamin K2’s heart- and bone-health benefits.

Numerous studies have shown that populations with higher daily vitamin K2 intake (more than 32 mcg) have a 50% reduction in the risk of death from cardiovascular disease compared to those with low intake.\(^3\,^9\) Calculated another way, for every 10-mcg per day-increase in vitamin K2 intake, the risk of coronary heart disease falls by 9%.\(^4\,^9\) In another study, women with the highest intake of vitamin K2 were found to be at a 20% lower risk for coronary artery calcification compared with women who had the lowest intake levels.\(^5\)

These benefits have been found to extend to bone health as well. Postmenopausal women taking 1,500 mg of calcium along with 45 mg of vitamin K2 daily experienced an increase in bone mineral density and a 55.9% reduction in inactive osteocalcin levels,\(^15\) a marker reported to be elevated in osteoporotic patients and related to an increased hip fracture risk.\(^16\,^{17}\) Another study showed that when 180 mcg of vitamin K2 daily was given for 3 years, it increased the amount of activated osteocalcin, produced significant improvements in bone mineral content and density, and increased bone strength.\(^18\)

High Praise

The findings from this recent Polish study were significant enough to merit published comments by other experts in the field.

The experts observed that patients in the combined vitamins K2 plus D3 arm of the study already had more severe kidney disease, despite being randomly assigned to the treatment groups. This means that the group taking vitamin K2 along with D3 succeeded *despite* a less favorable starting point compared with the group taking only vitamin D3.\(^14\)

Of course, while chronic kidney disease is common and deadly, patients with the disease are far from the only ones at risk for cardiovascular disease and bone loss arising from insufficient vitamin K2 intake. But given their extreme risk for those conditions, this patient population made an ideal test group to demonstrate the value of supplementation with both vitamin K2 and D3.
Western Diet is Deficient in Vitamin K2

The average American diet lacks enough vitamin K2—which is found primarily in organ meats, egg yolks, cheese, and in a Japanese staple dish of fermented soybean called natto—to properly activate those vitamin K-dependent proteins. Compounding the problem, vitamin K2 deficiency worsens with advancing age.

Fortunately, studies have shown that sustained vitamin K2 supplementation produces significant improvements in bone mineralization and strength and also in standard measurements of cardiovascular health.

The take-home message is that supplementing with vitamin K2 is practically mandatory for the average American desiring both healthy bones and a healthy cardiovascular system.

Summary

Vitamin K2 has the unique ability to activate proteins that send calcium to its proper destination, into bone, while simultaneously preventing calcium from being deposited in blood vessel walls.

A new study has shown that supplemental vitamin K2 can reduce the progression of arterial thickening and stiffening in a population of kidney disease patients, a group that notoriously has cardiovascular complications arising from excessive calcium deposition.

Thus, supplementation with vitamin K2 should be part of a daily longevity program for any aging adult interested in preserving both heart and bone health.

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


Magnesium is the most important mineral in the body, yet most Americans do not obtain sufficient magnesium from their diet. Magnesium is required for more than 300 biochemical reactions and many of the body’s critical functions are dependent upon it. Magnesium helps:

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- Keep heart rhythm steady.
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- Keep bones strong.
- Maintain blood sugar levels already within normal range.
- Promote normal blood pressure. Magnesium is also...
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The recommended intake of magnesium to maintain vascular health is 500 mg or more a day. With Life Extension® Magnesium Caps, you can easily obtain 500 mg of elemental magnesium for less than 7 cents a day!

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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.

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**Brite Eyes III** provides a powerful dose of two well-established lubricants in every drop, soothing eye discomfort without irritation. **Hydroxymethyl-cellulose** and **glycerin** are FDA-approved for ophthalmic use.

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Cardiovascular Health
Studies suggest that pistachios have anti-inflammatory benefits and may help lower LDL (“bad”) cholesterol when eaten as part of an overall healthy diet.³ Additionally, a 2010 study showed significantly lower triglyceride levels in subjects who ate pistachios.⁴

Nutritional Value
Pistachios contain a broad-spectrum of essential vitamins and minerals as well as protein, fiber, and an array of phytochemicals.⁵

References
Maintaining optimal vitamin B status becomes critical as we age.

B vitamins must be replenished daily because they are water soluble and easily depleted from the body. Stress, alcoholic beverages, and some medications can quickly deplete B vitamins.

Enzymatically Active Vitamins
When conventional B vitamins are ingested, they must be enzymatically converted in the body to metabolically active forms.

BioActive Complete B-Complex provides enzymatically active forms of meaningful potencies of each B vitamin. This includes the *pyridoxal 5'-phosphate* form of vitamin B6 (the metabolically active form, shown to protect lipids and proteins against *glycation* reactions) and the most biologically active form of *folate* called *5-methyltetrahydrofolate (5-MTHF)*, which is up to 7 times more bioavailable than folic acid and requires no enzymatic conversion to become metabolically active.4

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Choosing scientifically researched strains, delivering them alive, and stimulating their growth are keys to an effective probiotic.

On each of our probiotic supplements, we list strain designations for easy reference to related scientific and clinical studies. Not all probiotic strains are created equal and knowing the strains name is not enough, you need to be able to verify the identity of the exact strain. In addition to choosing quality strains that are backed with research, they must be delivered through the acidic stomach and can lose potency if not protected properly.

Master Supplements utilizes a natural carbohydrate derived from seaweed that forms a protective shell in the stomach but dissolves in the small intestine at a higher pH level, allowing the acid-sensitive probiotics to arrive alive at full strength in the G.I. tract.

Upon arrival, our patented prebiotic LactoStim®, which is composed of two food grade natural lipids, helps rehydrate the fragile, freeze-dried probiotic cells. This allows quick bioavailability and gives the probiotics a distinct advantage in the very competitive environment of the microbiome. The unique technology behind our formulas is protected by 17 US Patents.

We have been helping people with digestive and immune health since 2003. We are so confident that you will feel a difference by using our products that we offer a 60 day, 100% money back guarantee.

Call your Life Extension® Wellness Specialist to learn more.

Call Life Extension to place your order today. www.LifeExtension.com 1-800-544-4440

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

### Five Easy Steps:
1. Call 1-800-208-3444 to discuss and place your order with one of our knowledgeable Wellness Specialists. (This order form can also be faxed to 1-866-728-1050 or mailed). Online orders can also be placed at www.lifeextension.com.
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit; whichever is applicable (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable wellness specialists by calling 1-800-226-2370; or review the results with your personal physician.

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

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

### MOST POPULAR PANELS

<table>
<thead>
<tr>
<th>Panel Name</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBC/Chemistry Profile</td>
<td>See description, Estradiol, Free and Total Testosterone, DHEA-S, Progesterone, TSH, cortisol, T3, T4, Reverse T3, Insulin, Hemoglobin A1C, Vitamin D 25-hydroxy, C-Reactive Protein, High sensitivity, Ferritin, Homocysteine</td>
<td>$269</td>
</tr>
<tr>
<td>FEMALE HORMONE REPLACEMENT PANEL</td>
<td>See description, Estradiol, Free and Total Testosterone, DHEA-S, Progesterone, TSH, and Insulin</td>
<td>$189</td>
</tr>
<tr>
<td>WEIGHT LOSS PANEL-COMPREHENSIVE</td>
<td>See description, Estradiol, Free and Total Testosterone, DHEA-S, Progesterone, TSH, cortisol, T3, T4, Reverse T3, Insulin, Hemoglobin A1C, Vitamin D 25-hydroxy, C-Reactive Protein, High sensitivity, Ferritin.</td>
<td>$275</td>
</tr>
<tr>
<td>FEMALE ELITE PANEL*</td>
<td>See description, Estradiol, Free and Total Testosterone, Estragons, Estradiol, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, IGF-1, SHBG, Vitamin D 25-0H, hs-CRP, Ferritin, Homocysteine</td>
<td>$375</td>
</tr>
<tr>
<td>MALE HORMONE ADD-ON PANEL (LC100016)</td>
<td>Pregnenolone and Dihydrotestosterone (DHT). To provide an even more in-depth analysis of a man’s hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel.</td>
<td>$120</td>
</tr>
<tr>
<td>FEMALE HORMONE ADD-ON PANEL (LC100017)</td>
<td>Pregnenolone and Total Estragons. To provide an even more in-depth analysis of a woman’s hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel.</td>
<td>$125</td>
</tr>
</tbody>
</table>

### The ultimate information

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

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**COMPREHENSIVE THYROID PANEL**
- TSH, T4, Free T4, Free T3, Reverse T3, ITP, ATA

**LIFE EXTENSION THYROID PANEL**
- TSH, T4, Free T3, Free T4

**THYROID PANEL WITH REVERSE T3**
- TSH, T4, Free T3, Free T4, Reverse T3

**THE CBC/CHEMISTRY PROFILE**
- Total Cholesterol-Cholesterol/HDL Ratio, LDL Cholesterol-Estimated CHD Risk

**LIVER FUNCTION PANEL**
- AST, ALT, Total Bilirubin, ALK Phosphatase

**KIDNEY FUNCTION PANEL**
- Urea, Creatinine Ratio

**BLOOD PROTEIN LEVELS**
- Total Protein, Albumin, Albumin/Globulin Ratio

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

**BLOOD MINERAL PANEL**
- Calcium, Sodium, Potassium, Chloride, Iron, Phosphorus

**ADRENAL STRESS PROFILE-SALIVA**
- Cortisol AM/PM, DHEA-S, Glucurone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

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

**STRESS MANAGEMENT PROFILE**
- Cortisol AM/PM, DHEA-S, Glucurone, Insulin, Progesterone, Free T3, Lipid Panel

**ADRENAL STRESS PROFILE-SALIVA**
- Cortisol AM/PM, DHEA-S, Glucurone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

**FEMALE LIFE EXTENSION PANEL**
- Estradiol, DHEA-S, Progesterone, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

**MALE LIFE EXTENSION PANEL**
- Cortisol and Melatonin plus ratio.

**MALE COMPREHENSIVE LIVER PANEL**
- Total Cholesterol, Cholesterol/HDL Ratio, LDL Cholesterol, Estimated CHD Risk

**LIVER FUNCTION PANEL**
- AST, ALT, Total Bilirubin, ALK Phosphatase

**KIDNEY FUNCTION PANEL**
- Urea, Creatinine Ratio

**BLOOD PROTEIN LEVELS**
- Total Protein, Albumin, Albumin/Globulin Ratio

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

**BLOOD MINERAL PANEL**
- Calcium, Sodium, Potassium, Chloride, Iron, Phosphorus

**ADRENAL STRESS PROFILE-SALIVA**
- Cortisol AM/PM, DHEA-S, Glucurone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

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

**STRESS MANAGEMENT PROFILE**
- Cortisol AM/PM, DHEA-S, Glucurone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

**ADRENAL STRESS PROFILE-SALIVA**
- Cortisol AM/PM, DHEA-S, Glucurone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

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

**STRESS MANAGEMENT PROFILE**
- Cortisol AM/PM, DHEA-S, Glucurone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol

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**MTHFR/COMT GENETIC METHYLATION PROFILE**
- Tests for genetic mutations in MTHFR and COMT.

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**MTHFR/COMT GENETIC METHYLATION PROFILE**
- Tests for genetic mutations in MTHFR and COMT.
Other Popular Tests and Panels

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

- **HEALTHY AGING PANEL-BASIC**
  
  (LC100025)
  
  CBC/Chemistry profile, C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Vitamin D 25-hydroxy, Hemoglobin A1C, TSH, Ferritin, and Insulin.
  
  **$149**

- **NMR LIPOPROFILE**
  
  (LC123810)
  
  The NMR LipoProfile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one’s risk of insulin resistance by assessing abnormalities in lipoprotein markers.
  
  **$99**

- **ANEMIA PANEL**
  
  (LC100006)
  
  CBC/Chemistry profile, Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate, and Iron saturation.
  
  **$79**

- **AUTOIMMUNE DISEASE SCREEN**
  
  (L100041)
  
  ANA screen, hs-CRP, TNF-alpha, Immunoglobulins, IgA, IgG, IgM.
  
  **$189**

- **DIABETES MANAGEMENT PROFILE – COMPREHENSIVE**
  
  (LC100040)
  
  
  **$129**

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

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

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

- **OMEGA CHECK**
  
  (LCOMEGA)
  
  Provides valuable information on your risk of developing heart disease, sudden heart attack and cardiac death. The Omega Check™ also includes your AA:EPA ration allowing you to determine and track a major factor in total body inflammation.
  
  **$131.25**

- **HORMONES**
  
  **DHEA-SULFATE**
  
  (LC004020)
  
  This test shows if you are taking the proper amount of DHEA.
  
  **$61**

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

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

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

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

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

- **PREGNENOLIDONE**
  
  (LC140707)
  
  Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing’s syndrome.
  
  **$116**

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

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

- **GENERAL HEALTH**
  
  **VITAMIN D (25OH)**
  
  (LC081950)
  
  This test is used to rule out vitamin D deficiency.
  
  **$47**

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

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

Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.

This is NOT a complete listing of LE blood test services. Call 1-800-208-3444 for additional information.

With Your Healthy Rewards, you earn LE Dollars back on every purchase you make including blood tests! See www.LifeExtension.com/Rewards for details.

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ORDER LIFESAVING BLOOD TESTS FROM VIRTUALLY ANYWHERE ANYWHERE IN THE US!

**TERMS AND CONDITIONS**

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and Life Extension® contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor Life Extension® will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance. I have read the above Terms and Conditions and understand and agree to them.

Signature   

X

CUSTOMER NO.

Male  Female

Name

Date of Birth (required) / /  

Address

City

State Zip

Credit Card No.

Expiration Date / /

Phone

Mail your order form to:

Life Extension National Diagnostics, Inc.

3600 West Commercial Boulevard

Fort Lauderdale, FL 33309

Phone your order to: 1-800-208-3444

Fax your order to: 1-866-728-1050

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

** This test is packaged as a kit.
### Amino Acids
- Arginine/L-Ornithine Capsules
- Arginine Ornithine Powder
- Branch Chain Amino Acids
- D,L-Phenylalanine Caps
- L-Arginine Caps
- L-Carnitine
- L-Glutamine
- L-Glutamine Powder
- L-Lysine
- L-Taurine Powder
- L-Tyrosine Powder
- Super Carnosine
- Taurine

### Blood Pressure & Vascular Support
- Advanced Olive Leaf Vascular Support
- Calenipe 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

### Bone Health
- Bone Restore
- Bone Strength Formula with KoAct™
- Bone-Up™
- Calcium Citrate with Vitamin D
- Dr. Strum’s Intensive Bone Formula
- Strontium 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™
- Cognitex® CDP-Choline Caps
- DMAE Bitartrate (dimethylaminoethanol)
- Dopa-Mind™
- Ginkgo Biloba Certified Extract™
- Huperzine A
- Lecithin Granules
- Miga-Enze™
- Neuro-Mag® Magnesium L-Theonate
- Neuro-Mag® Magnesium L-Theonate with Calcium and Vitamin D3
- Optimized Ashwagandha Extract Prevagen™
- PS (Phosphatidylserine) Caps
- Vinpocetine

### Cholesterol Management
- Advanced Lipid Control
- Cho-Less™
- CHOL-Support™
- Red Yeast Rice
- Theaflavine Standardized Extract
- Vitamin B3 Nicin Capsules

### Digestion Support
- Artichoke Leaf Extract
- Camosoothe with PicroProtect™
- Digest RC™
- Effervescent Vitamin C · Magnesium Crystals
- Enhanced Super Digestive Enzymes
- Enhanced Super Digestive Enzymes w/Probiotics
- Esophagual Guardian
- Extraordinary Enzymes

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

### Eye Health
- Astaxanthin with Phospholipids
- Brite Eyes III
- Certified European Bilberry Extract
- Eye Pressure Support with Mitogena®
- MacuGuard® Oc He Support
- MacuGuard® Oc Support with Astaxanthin
- Tear Support with MaquiBright™

### Fish Oil & Omegas
- OMEGA FOUNDATIONS® Mega EPA/DHA with Sesame Lignans
- OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans & Olive Extract
- OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans
- OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
- OMEGA FOUNDATIONS® Proven® Purified Omega-3
- OMEGA FOUNDATIONS® Vegetarian DHA Organic Golden Flax Seed

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

### Glucose Management
- CinSulin® with InSea2® and Crominex® 3 Plus Mega Bentonitme
- Natural Glucose Absorption Control
- Tri Sugar Shield™

### Heart Health
- Aspirin (Enteric Coated)
- BioActive Folate & Vitamin B12 Caps
- Cardio Peak™ with Standardized Hawthorn and Arjuna
- Fibrinogen Resists™ with Nattokinase
- 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
- Triple Action Cruciferous Vegetable Extract

### Immune Support
- AHCC®
- Echinacea Extract
- Enhanced Zinc Lozenges
- Immune Modulator with Tinofend®
- Immune Protect with PARACTIN®
- Immune Senescence Protection Formula™
- Kynoko® Gold AHCC
- Kyolic® Garlic Formula 102
- Kyolic® Garlic Formula 105
- 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 AprésFlex®
- Advanced Bio-Curcumin® with Ginger & Turmerones
- Black Cumin Seed Oil
- Black Cumin Seed Oil with Bio-Curcumin®
- Boswellia
- Cytokine Suppressor™ with EGCG
- Nervia®
- Serrafazyme
- Specially-Coated Bromelain
- Super Bio-Curcumin®
- Zytiflame® Whole Body

### Joint Support
- Arthro-Immune Joint Support
- ArthroMax® Advanced with UC-II® & AprésFlex®
- ArthroMax® with Theaflavins & AprésFlex®
- Bio-Collagen with Patented UC-II®
- Fast-Acting Joint Formula
- Glucosamine/Chondroitin Capsules
- Knee Healthy Joint Formula
- MSM (Methylsulfonylmethane)

### Kidney & Bladder Support
- Cran-Max® Cranberry Whole Fruit Concentrate
- Optimized Cran-Max® with Ellirose™
- Uric Acid Control
- Water-Soluble Pumpkin Seed Extract

### Liver Health & Detoxification
- Anti-Alcohol Antioxidants 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 caffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Optimized Resveratrol with Nicotinomide
Riboside
pTeoPure®
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
Pomi-T®
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

Minerals
Boron
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™ 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/VERISOIL®
Hair Suppressor Formula
Life Extension Toothpaste

Sinus Cleanser
Venotone
Xylitol-white Mouthwash

Pet Care
Cat Mix
Dog Mix

Probiotics
Bifido GI Balance
BroccoMax®
FLORASSIST® Balance
FLORASSIST® Heart Health
FLORASSIST® Mood
FLORASSIST® Oral Hygiene
FLORASSIST® Throat Health
Theralac® Probiotics
TruFlora® Probiotics

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

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 Dihydroquercetin
Gamma E Tocopherol with Sesame Lignans
Gamma E Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK-7
Natural Vitamin E
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5’-Phosphate Caps
Super Absorbable Tocotrienols
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K with Advanced K2 Complex
Vitamin B12
Vitamin B6
Vitamin C with Dihydroquercetin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

Weight Management
7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCAActive™ Garcinia Cambogia Extract
IntegraLean®
Mediterranean Trim with Sinetrol™-XPUr
Optimized Irvingia with Phase 3® Calorie 
Control Complex
Optimized Saffron with Satireal®
Super Citrimax®
Super CLA Blend with Guaran and 
Sesame Lignans
Super CLA Blend with Sesame Lignans

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

CalObjective
Optimized Resveratrol
Resveratrol & Pterostilbene
Formula with Beta-Sitosterol
Boride
pTeoPure®
Pycnogenol® French Maritime
Pine Bark Extract
Resveratrol with Pterostilbene
RNA (Ribonucleic Acid)
Super R-Lipoic Acid
X-R Shield
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<td>HYALURONIC OIL-FREE FACIAL MOISTURIZER</td>
<td>1 oz</td>
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<tr>
<td>80138</td>
<td>HYDRATING ANTIOXIDANT FACE MIST</td>
<td>4 oz</td>
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<tr>
<td>80103</td>
<td>LIFTING &amp; TIGHTENING COMPLEX</td>
<td>1 oz</td>
</tr>
<tr>
<td>80146</td>
<td>LYCOPENE CREAM</td>
<td>1 oz</td>
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<tr>
<td>80135</td>
<td>MELATONIN CREAM</td>
<td>1 oz</td>
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<tr>
<td>80114</td>
<td>MILD FACIAL CLEANSER</td>
<td>8 fl oz</td>
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<tr>
<td>80159</td>
<td>MULTI STEM CELL SKIN TIGHTENING COMPLEX</td>
<td>2 oz</td>
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<tr>
<td>80122</td>
<td>NECK REJUVENATING ANTI-OXIDANT CREAM</td>
<td>2 oz</td>
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<tr>
<td>80111</td>
<td>PIGMENT CORRECTING CREAM</td>
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<tr>
<td>80106</td>
<td>REJUVENATING SERUM</td>
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<tr>
<td>80150</td>
<td>RENEWING EYE CREAM</td>
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<tr>
<td>80142</td>
<td>RESVERATROL ANTI-OXIDANT SERUM</td>
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<tr>
<td>80112</td>
<td>SKIN LIGHTENING SERUM</td>
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<tr>
<td>80130</td>
<td>SKIN STEM CELL SERUM</td>
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<td>80143</td>
<td>STEM CELL CREAM W/ALPINE ROSE</td>
<td>1 oz</td>
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<td>80148</td>
<td>LIGHTENING &amp; FIRMING NECK CREAM</td>
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<td>80161</td>
<td>TRIPLE ACTION VITAMIN C CREAM</td>
<td>1 oz jar</td>
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<tr>
<td>80162</td>
<td>ULTIMATE MICRODERMABRASION</td>
<td>8 fl oz</td>
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<tr>
<td>80160</td>
<td>ULTRA EYELASH BOOSTER</td>
<td>0.25 oz (2 units $39)</td>
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<td>80116</td>
<td>ULTRA LIP PLUMPER</td>
<td>1/3 oz</td>
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<td>80101</td>
<td>ULTRA WRINKLE RELAXER</td>
<td>1 oz</td>
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<tr>
<td>80113</td>
<td>UNDER EYE REFINING SERUM</td>
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<tr>
<td>80114</td>
<td>UNDER EYE REJUVENATE CREAM</td>
<td>1/2 oz</td>
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<td>80129</td>
<td>VITAMIN C SERUM</td>
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<td>80138</td>
<td>VITAMIN D LOTION</td>
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<td>80145</td>
<td>VITAMIN E-ESSENTIAL CREAM</td>
<td>1 oz</td>
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<td>80149</td>
<td>YOUTH SERUM</td>
<td>1 oz</td>
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**SUBTOTAL OF COLUMN 3**

**SUBTOTAL OF COLUMN 4**
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<th>Item No.</th>
<th>Product</th>
<th>Retail Each $</th>
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<th>10 Unit Each</th>
<th>QTY Total</th>
</tr>
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<tbody>
<tr>
<td>01358</td>
<td>Digest RC® • 30 tablets</td>
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<tr>
<td>02021</td>
<td>Digestive Enzymes (Enhanced Super) • 60 veg. caps</td>
<td>22.00</td>
<td>16.50</td>
<td>15.00</td>
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<tr>
<td>02022</td>
<td>Digestive Enzymes w/Probiotics (Enhanced Super) • 60 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td>18.00</td>
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<tr>
<td>01671</td>
<td>D. L-Phenylalanine • 500 mg, 100 veg. caps</td>
<td>18.75</td>
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<td>12.00</td>
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<tr>
<td>01540</td>
<td>DMAE Bitartrate • 150 mg, 200 veg. caps</td>
<td>18.00</td>
<td>13.50</td>
<td>11.25</td>
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<tr>
<td>01570</td>
<td>DNA Protection Formula • 60 veg. caps</td>
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<td>24.00</td>
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<tr>
<td>01391</td>
<td>Dog Mix • 100 grams powder</td>
<td>18.00</td>
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<tr>
<td>02006</td>
<td>Dopa-Mind™ • 60 veg. tabs</td>
<td>48.00</td>
<td>36.00</td>
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<tr>
<td>00321</td>
<td>Dr. Proctor’s Advanced Hair Formula • 2 oz</td>
<td>39.95</td>
<td>29.96</td>
<td>24.00</td>
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<tr>
<td>00320</td>
<td>Dr. Proctor’s Hair Shampoo • 8 oz</td>
<td>24.95</td>
<td>18.71</td>
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**Extraordinary Enzymes**

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<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>
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<tbody>
<tr>
<td>01528</td>
<td>Echinacea Extract • 250 mg, 60 veg. caps</td>
<td>14.35</td>
<td>10.76</td>
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<tr>
<td>00997</td>
<td>Endothelial Defense™ w/Pomegranate Complete and Cordarite™ • 60 softgts</td>
<td>68.00</td>
<td>51.00</td>
<td>46.50</td>
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<tr>
<td>00997</td>
<td>Endothelial Defense™ w/Glisodin™ • 60 veg. caps</td>
<td>54.00</td>
<td>40.50</td>
<td>36.00</td>
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<tr>
<td>01387</td>
<td>EPA/DHA (Mega) • 120 softgts</td>
<td>20.00</td>
<td>15.00</td>
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<tr>
<td>01737</td>
<td>Esophageal Guardian (berry flavor) • 60 chewable tablets</td>
<td>36.00</td>
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<tr>
<td>01642</td>
<td>European Leg Solution Diosmin 95 • 600 mg, 30 veg. tabs</td>
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<tr>
<td>01706</td>
<td>Extraordinary Enzymes • 60 caps</td>
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<td>02008</td>
<td>(California Estate) Extra Virgin Olive Oil • 500 ml (16.9 fl. oz)</td>
<td>33.00</td>
<td>24.75</td>
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<tr>
<td>01514</td>
<td>Eye Pressure Support w/Mirtogenol® • 30 veg. caps</td>
<td>38.00</td>
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**Face Master® Platinum**

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<th>Product</th>
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<tr>
<td>00965</td>
<td>Fast-Acting Joint Formula • 30 caps</td>
<td>39.00</td>
<td>29.25</td>
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<tr>
<td>01717</td>
<td>Fast-C® w/Dihydroquercetin • 120 veg. tabs</td>
<td>26.00</td>
<td>19.50</td>
<td>18.00</td>
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<tr>
<td>02053</td>
<td>Fem Dophilus® • 30 caps</td>
<td>25.95</td>
<td>19.46</td>
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<tr>
<td>02055</td>
<td>Fem Dophilus® • 60 caps</td>
<td>39.95</td>
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<tr>
<td>01664</td>
<td>Femmenesence Macapause® • 120 veg. caps</td>
<td>34.99</td>
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<td>02007</td>
<td>Fiber-Immune Support (Apple Cinnamon) • 235 grams</td>
<td>34.00</td>
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<tr>
<td>00718</td>
<td>Fibrinogen Resist™ • 30 veg. caps</td>
<td>49.00</td>
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<tr>
<td>01749</td>
<td>Flax Seed (organic golden) • 14 oz</td>
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<tr>
<td>01821</td>
<td>Florassist® Heart Health • 60 veg. caps</td>
<td>32.00</td>
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<td>02019</td>
<td>Florassist® Oral Hygiene • 30 lozenges</td>
<td>18.00</td>
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<td>01825</td>
<td>Florassist® Balance • 30 liquid veg. caps</td>
<td>32.00</td>
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<td>02000</td>
<td>Florassist® Mood • 60 caps</td>
<td>33.00</td>
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<tr>
<td>01820</td>
<td>Florassist® Throat Health • 30 lozenges</td>
<td>20.00</td>
<td>15.00</td>
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<tr>
<td>01913</td>
<td>Folate High Potency (optimized) • 5,000 mcg, 30 veg. tablets</td>
<td>25.00</td>
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<td>16.50</td>
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<tr>
<td>01939</td>
<td>Folate (Optimized) • 1,000 mcg, 100 veg. tablets</td>
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<tr>
<td>01842</td>
<td>Folate + Vitamin B12 (BioActive) • 90 veg. caps</td>
<td>12.00</td>
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<td>01544</td>
<td>Forskolin • 10 mg, 60 veg. caps</td>
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<tr>
<td>01513</td>
<td>Fucoidan w/Maritech® 926 (optimized) • 60 veg. caps</td>
<td>36.00</td>
<td>27.00</td>
<td>24.75</td>
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**Gamma E Tocopherol/Tocotrienols**

<table>
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<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>
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</tr>
</thead>
<tbody>
<tr>
<td>02070</td>
<td>Gamma E Tocopherol/Tocotrienols • 60 softgels</td>
<td>40.00</td>
<td>30.00</td>
<td>27.00</td>
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<tr>
<td>00759</td>
<td>Gamma E Tocopherol W/Sesame Lignans • 60 softgels</td>
<td>32.00</td>
<td>24.00</td>
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<tr>
<td>01394</td>
<td>Garlic (Optimized) • 200 veg. caps</td>
<td>24.95</td>
<td>18.71</td>
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**Ginger Force**

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<tr>
<td>01222</td>
<td>Ginger Force® • 60 liquid caps</td>
<td>34.95</td>
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</table>

**Subtotal of Column 5**

**Subtotal of Column 6**

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

Receive 25% off the retail price of all products.
### M

<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>
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<tr>
<td>01068</td>
<td>LIVER EFFICIENCY FORMULA w/ 30 veg. caps</td>
<td>18.00</td>
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<tr>
<td>01639</td>
<td>5-LOX INHIBITOR W/PRÊSÍFLEX® w/ 100 mg, 60 veg. caps</td>
<td>22.00</td>
<td>16.50</td>
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<td>01678</td>
<td>L-LYSINE w/ 620 mg, 100 veg. caps</td>
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<td>00455</td>
<td>LYOCPONE (Mega) w/ 15 mg, 90 softgels</td>
<td>35.00</td>
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<td>22.50</td>
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### N

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<th>4 Unit Each</th>
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<td>01534</td>
<td>N-ACETYLC-L-CYSTEINE w/ 600 mg, 60 veg. caps</td>
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<td>NAD+ CELL REGENERATOR® w/ 100 mg, 30 veg. caps</td>
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<td>NATOKINASE w/ 60 softgels</td>
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<td>01807</td>
<td>NATURAL APPETITE SUPPRESS (Advanced) w/ 60 veg. caps</td>
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<td>NATURAL BP MANAGEMENT w/ 60 tablets</td>
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<td>01892</td>
<td>NATURAL ESTROGEN w/ 60 veg. tabs</td>
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<td>NATURAL SEX FOR WOMEN® 50+ (Advanced) w/90 veg. caps</td>
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<td>NATURAL SLEEP w/ 60 caps</td>
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<td>NATURAL SLEEP w/ MELATONIN (Enhanced) w/ 30 caps</td>
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<td>NATURAL SLEEP w/ MELATONIN (Enhanced) w/ 30 caps</td>
<td>20.00</td>
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### Subtotal of Column 7

### Subtotal of Column 8

### TO ORDER ONLINE VISIT: www.LifeExtension.com

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
<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>
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<tr>
<td>01309</td>
<td>QUERCETIN (Optimized) • 250 mg, 60 veg. caps</td>
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<td>01300</td>
<td>RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps</td>
<td>17.60</td>
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<tr>
<td>00605</td>
<td>REGIMINT • 60 enteric-coated caps</td>
<td>19.95</td>
<td>14.96</td>
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<td>01708</td>
<td>REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps</td>
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<td>REJUVENEX® BODY LOTION • 6 oz</td>
<td>24.00</td>
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<td>REJUVENEX® FACTOR FIRMING SERUM • 1.7 oz</td>
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<td>01220</td>
<td>REJUVENEX® (Ultra) • 2 oz</td>
<td>52.00</td>
<td>39.00</td>
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<td>REJUVENIGHT® (Ultra) • 2 oz</td>
<td>39.95</td>
<td>29.96</td>
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<td>01410</td>
<td>RESVERATROL W/pterostilbene • 100 mg, 60 veg. caps</td>
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<td>02031</td>
<td>RESVERATROL W/nicotinamide riboside</td>
<td>42.00</td>
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**Books**

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**SUBTOTAL OF COLUMN 12**

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

Not sure exactly which supplements you need? Talk to a Wellness Specialist toll-free at 1-800-226-2370
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**POSTAGE & HANDLING** *(Any size order, in the U.S. includes Alaska & Hawai) $5.50*

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

- UPS OVERNIGHT add $16, UPS 2nd DAY AIR add $7. For Puerto Rico, US Virgin Islands, add $7. CANADA UPS EXPRESS Flat rate $17.50, UK Flat rate $25 USD. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.

**SHIPPING**

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

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Prices subject to change without notice. Please notify Life Extension of any address change.

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CoQ10 energizes aging cells and enhances mitochondrial function.

Decline in mitochondrial activity is linked to accelerated brain aging.

Shilajit works with CoQ10 to increase cellular energy.
Around-the-clock blood pressure control is critical for healthy longevity. A unique formulation works to help control blood pressure day and night.

Accumulating data show that pomegranate polyphenols have protective abilities against common cancers, in addition to maintaining healthy endothelial function.

Life Extension®’s long-held position regarding lower blood pressure has been further validated. A newly published study showed a 43% lower risk of cardiovascular death when systolic blood pressure targets are under 120.

Insufficient sleep shortens lifespans. Three natural substances have been found to improve sleep and normalize sleep cycles.

Eyelid skin is susceptible to premature aging. A physician’s formulation has been shown to counter dark circles and bags under the eyes.

In her new book, The Sleep Revolution, Arianna Huffington discusses the dangers of sleep deprivation that can lead to chronic health problems.

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