Shocking Facts Behind High Drug Prices

How Curcumin Protects Against Brain Aging
Reduce Excess Uric Acid Levels
Theanine Preserves Cognitive Function
Novel Probiotic Improves Mood

PLUS—
FDA Approves Anti-Aging Study on Metformin
Testosterone Improves Insulin Sensitivity in Diabetics
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Are You Getting The Maximum Potency From Your Daily Vitamin?

Life Extension®'s Two-Per-Day formulas are the highest potency multivitamins on the market. Compared to Centrum® Silver® Adults 50+, Two-Per-Day provides:

- 50 times more vitamin B1
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- 10 times more biotin
- 10 times more selenium
- 8 times more vitamin C
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- 2 times as much vitamin E
- 2.5 times as much vitamin B3
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Centrum® Can’t Compete

Two-Per-Day Capsules
Item #02014 • 120 capsules (2-month supply)

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Two-Per-Day Tablets
Item #02015 • 120 tablets (2-month supply)

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To order Life Extension Two-Per-Day Tablets or Two-Per-Day Capsules, call 1-800-544-4440 or visit www.LifeExtension.com

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

• The Most Complete Line of Life Extension Supplements

on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional.

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At Life Extension Magazine® we value your opinion and welcome feedback. Please mail your comments to Life Extension Magazine®, Attn: Letters to the Editor, PO Box 407198, Fort Lauderdale, FL 33340 or email us: LEmagazine@LifeExtension.com

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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.

Life Extension’s Triple Action Cruciferous Vegetable Extract combines vital plant extracts into a comprehensive formula to provide optimal DNA protection. Each capsule also contains:

- Indole-3-carbinol (I3C) and di-indolyl-methane (DIM) to encourage liver detoxification and modulate estrogen metabolism
- Bioactive cruciferous compounds like glucosinolates that have favorable effects on healthy cell division
- Apigenin, a powerful plant flavonoid, that boosts cell protection

Those who want the additional benefits of trans-resveratrol can order Triple Action Cruciferous Vegetable Extract with Resveratrol. Each vegetarian capsule contains 20 mg of trans-resveratrol in addition to the vegetable extract.

References

To order Triple Action Cruciferous Vegetable Extract, call 1-800-544-4440 or visit www.LifeExtension.com

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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. Bezzer, 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, a board-certified plastic surgeon, was medical director of the micro-surgical 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.

Sergey A. Dzugan, MD, PhD, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzugan’s current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.

Patrick M. Fratellone, MD, RH, is the founder and executive medical director of Fratellone Associates. He completed his Internal Medicine and Cardiology Fellowship at Lenox Hill Hospital in 1994, before becoming the medical director for the Atkins Center for Complementary Medicine.

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 Bahamian 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 Benemérita Universidad Autonoma De Puebla, Mexico, as a professor of cellular hematopoietic studies.

Gary Goldfaden, MD, is a clinical dermatologist and a lifetime member of the American Academy of Dermatology. He is the founder of Academy Derma- tology 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 Osteopathic 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, Fls.

Prof. Francesco Marotta, MD, PhD, Montenapoleone Medical Center, Milan, Italy. Gastroenterologist and nutrigenomics expert with extensive international university experience, Consulting Professor, WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy. Hon. Res. Professor, Human Nutrition Dept, TWU, USA. Author of over 130 papers and 400 congress lectures.

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 merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

Filippo Ongaro, MD, is board-certified in anti-aging medicine and has worked for many years as flight surgeon at the European Space Agency. He is considered a pioneer in functional and antiaging medicine in Italy where he also works as a journalist and a writer.

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.

Lambert Titus K. Parker, MD, practices internal medicine at the Integrative Longevity Institute of Virginia in Virginia Beach, VA.

Ross Pelton, RPh, PhD, CCN, is director of nutrition and anti-aging research for Intrademcide, 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 staffs of Pacific Alliance Medical Center, Los Angeles, and other area hospitals.

Michael R. Rose, MD, is a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staffs 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. 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.
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 anticancer 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 Eichorn, 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 is working 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, cryothermia, 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), FRCPath., 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 nanopores 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.
Low Cost Biologically Active B-COMPLEX

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.

**Retail Your Price**

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**References**


To order BioActive Complete B-Complex, call 1-800-544-4440 or visit www.LifeExtension.com

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No one has fought against high drug prices longer or harder than Life Extension®. 1-20

The penalty for exposing health care corruption is endless governmental investigations aimed at destroying our organization. The tide may be turning in our favor.

*The New England Journal of Medicine* published a report that uncovered a drug price scandal that we’ve sought to expose for the past four decades. 21

*CBS News* turned this consumer swindle into a headline report that graphically depicted the devastating impact that skyrocketing generic drug prices are having. 22

The next day, I gave an impromptu speech at an Alzheimer’s seminar where I asked the audience to join me in amending the law to prohibit the FDA from granting monopoly status to generic drug makers. Virtually everyone in the audience said they would personally take the time to protest high drug prices at local congressional offices.

Two months later, *60 Minutes* featured an in-depth report on today’s broken sick care system. A quote from this *60 Minutes* broadcast relating to the Affordable Care Act stated that it is the product of an:

“...orgy of lobbying and backroom deals in which just about everyone with a stake in the $3-trillion-a-year health industry came out ahead—except the taxpayers.” 23

The *60 Minutes* report went on to state there is “no way in the world that we’re gonna be able to pay for it.”

Investigative journalists have since corroborated how high drug prices are causing American consumers to become serfs of the pharmaceutical industry.

This month’s issue of *Life Extension*® reveals shocking new details of a price-gouging disgrace that is contributing to the insolvency of our sick care system.
Today’s medical system provides mediocre efficacy at prohibitive prices.

When you read news stories about municipal, corporate, or personal bankruptcies, the high cost of health care is a consistent underlying factor.

Misguided politicians believe that government subsidies, mandates, and giveaways can resolve high health care costs.

Even a cursory glance at the extravagant prices of new medications exposes the falsity of this charade. When a single new drug can cost $100,000, and protocols are being developed that combine several drugs priced in this range, how can any form of “cost-sharing” be expected to work?

It has become mathematically impossible for these outlandish health care costs to become “affordable” via government edict.

For example, the bottle of the prescription drug **Valcyte®** you see pictured below with my name on it contains 60 tablets. The price for this bottle of **Valcyte®** is around $4,200. This works out to approximately $70 per tablet.

My cost for a four-month course of this medication is over $16,000. Some people are spending over $50,000 a year for this drug to stay alive—and this is often just one of many medications they need.

Before I describe a simple solution to this epidemic problem, I want to enlighten you to a growing scam in the prescription **generic drug** arena that finally is generating mainstream media coverage.

**Magnitude of the Fraud**

Price gouging on a growing number of **generic** drugs has grown beyond verbal description.

In the box you see on this page are examples of price increases occurring in the **generic drug** marketplace reported on by the **New England Journal of Medicine**. These kinds of price increases are not unique. They reflect a growing swath of generic drugs that cost virtually nothing to manufacture, but they are spiking to stratospheric consumer price levels.

The **New England Journal of Medicine** gave an example of a generic drug (albendazole) that costs less than one dollar per daily dose overseas, but has risen to $119 per typical daily dose in the United States ($3,570 per month). This is a 2,010% increase from what this same generic drug cost in 2010.

**Medicaid** spending on this one drug alone (albendazole) spiked from $100,000 in 2008 to $7.5 million in 2013—a 75-fold increase.21
We’re All Being Defrauded

Whether or not you need a generic drug whose price has exponentially increased, you are paying through higher health insurance premiums, higher deductibles, and higher copays, as well as limitations on what physician you may use and what services that doctor may perform.

A generic drug that I use called tretinoin costs $1,100 per month. My health insurance covers $850 and I have to pick up the balance of $250 per month.

This drug (tretinoin) was approved in 1995 and long ago lost patent protection, yet it is costing me $13,200 per year. I say me because I pay this extortionist price via my insurance premiums along with the many “exclusions” that cause me to pay out-of-pocket for what health insurance used to cover.

What may shock you most is what the active ingredient of this drug costs. Consumers are paying over $1,100 for this bottle of tretinoin. Yet the active ingredient for the entire bottle costs a mere 80 cents. Even including encapsulation and quality control, that’s a markup of about 400 times over the cost to make this off-patent drug.

As we reported in the September 2014 edition of Life Extension® magazine, collusion amongst drug makers is causing generics to be priced beyond rational affordability.

The cover headline of the September 2014 issue was titled “How to Turn 8 Pennies Into $600.” This was based on an article where I reveal that an antiviral cream (acyclovir) that long ago lost patent protection was being sold to pharmacies for 7,500% over the active ingredient cost. The active ingredient (acyclovir) costs only 8 pennies, yet pharmacies are paying a generic maker $600 for this drug and selling it to consumers for around $700.

The media has just started reporting on the magnitude of generic drug price gouging. As a reader of Life Extension® magazine, you’ve been the first to learn about what generic drugs really cost to make.

These kinds of price markups are unsustainable. They are part of the reason why health care has become unaffordable whether or not you have so-called “insurance.”

An increasing number of experts are coming to this realization, including editors of The New England Journal of Medicine and other publications. We are all being defrauded by this unconscionable price gouging made possible by overregulation of prescription drugs.

I Used to Own a Pharmacy

I established a retail pharmacy (Life Extension Pharmacy) in an attempt to slash the high cost of generic drugs. I was able to witness some of the manipulation going on behind the scenes that results in consumer prices for generics spiraling upwards.

Our pharmacists never knew what the price of a generic drug would be from day to day. Some drug companies “stop making” certain generics altogether, which usually results in a massive price spike from the remaining maker(s). This happens because competition has all but disappeared.

One reason I set up the Life Extension Pharmacy in 2008 was to slash the prices of generic drugs to our members. Back then, pharmacies were selling generic drugs at out-of-pocket prices that were higher than what average people could afford.

My goal of slashing consumer prescription drug costs was short lived, as generic makers raised prices so high that even copays on certain drugs remained unaffordable, even though the cost to make most generics is virtually nothing.
Why This Concerns Life Extension®

New readers may wonder why an organization like Life Extension®, which is best known for pioneering lifesaving nutrients like coenzyme Q10, is making a big deal about generic drug price gouging.

One reason is that Life Extension® does far more than formulate advanced dietary supplements. Our Disease Prevention and Treatment protocols contain recommendations for people to ask their doctors about trying off-label drugs in order to achieve a better clinical outcome.

Our track record of recommending off-label drugs like metformin and cimetidine to better treat disease is unparalleled. Insurance companies, however, often refuse to pay for the off-label prescribed drugs we recommend.

If this price gouging does not stop, it will render off-label use of these drugs meaningless as consumers will not be able to afford the generic drug’s high cost.

So in addition to sparing this nation’s sick care system from economic collapse, we at Life Extension® need to ensure that affordable generic medications are available when the need arises for them.

A Free-Market Solution

The solution to this problem of rip-off drug pricing is to amend the Food, Drug, and Cosmetic Act to allow more competition in the generic marketplace. If enacted, generic prices will plummet to levels so low you won’t even worry about what percentage your insurance company pays.

When generic drugs drop this much, it will push down many patented pharmaceutical prices because generic substitutes often work as well as newer branded drugs.

Against us are pharmaceutical lobbyists who will do virtually anything to protect their lucrative monopoly against free-market competition.

On our side are 330 million American consumers, most of whom cannot afford to fall ill even if they have health insurance. That’s because the deductibles, copays, and exclusions result in enormous out-of-pocket expenses that are today’s leading cause of personal bankruptcies.

My question is how many of you want to take political action to stop this price gouging?

We’ve Fought the Drug Cartels since the 1980s

Life Extension® learned about the rip-off prices Americans were paying for their medications in the 1980s.

We launched a relentless campaign to educate the public and Congress about the high prices Americans were forced to pay compared to what identical medications cost in Europe and other countries.

When digging through a box of old papers, I ran across one of the many newspaper ads our supporters paid for to expose the corrupt prices and drug approval delays that were killing American citizens. We’ve reprinted one of those ads from year 1991 on the next page.

You can see the date on this newspaper ad is October 11, 1991. On November 7, 1991, we were in handcuffs standing before a federal judge with the FDA insisting that we be denied bond because we represented a danger to the public (for informing Americans that lower-priced medications could be obtained almost anywhere else in the world).

Fortunately, an avalanche of letters from our supporters to the judge helped persuade him to grant us bond ($1 million). The multiple charges the FDA tried to use to indict us were eventually dismissed by the Department of Justice in 1995-1996.

If it were not for our supporters standing up to the FDA’s attempts to incarcerate us, there would be no Life Extension® organization.
today, and supplements like coenzyme Q10 would likely be available only via expensive prescription.

Americans today routinely obtain lower-priced medications from Canada because they can access offshore pharmacies via the Internet. This was not the case in the 1980s-1990s. Back then, the FDA viciously fought anyone who dared to inform Americans where they could purchase less expensive medications.

**Legislation Urgently Needed!**

Fighting the FDA’s ban on personal use importations of medications was only one battle we spearheaded. The other dealt with FDA’s attempts to turn many dietary supplements into prescription drugs.

When we initiated action to combat FDA’s attempts to ban dietary supplements, a huge percentage of our supporters rallied to stop this from happening.

The result was passage of a bill (Dietary Supplement Health and Education Act-1994) that protected supplements and substantially lowered consumer prices.

For those who think it’s not worth the effort to let your voice be heard, consider the consequences of failing to take action. Seniors may have to return to the work force to afford their medications.

---

**WHY DO PRESCRIPTION DRUGS COST SO MUCH?**

In the 1980’s prescription drug prices went up to three times faster than inflation!

Medical costs are rising so fast now, that pharmaceutical companies schedule four new price increases every year!

If you pay for your medical insurance, then you know your premiums skyrocket every year. Employees are now being asked to subsidize their medical insurance plans because the costs have exceeded the employer’s ability to pay.

If you cannot afford medical insurance and get sick, you may not be able to get any medical care.

**THE FDA IS THE REASON MEDICATIONS ARE SO COSTLY**

Because of bureaucratic “red tape”, it now costs pharmaceutical companies an average of 231 million dollars to develop one new patent medicine and get it “approved”.

This FDA mandated high-cost of “approval” forces pharmaceutical companies to charge the outrageous prices you pay for prescription drugs.

In Europe, where approval requirements are more reasonable, the exact same medicine costs far less money.

The Parkinson’s Disease medication Eldepryl can be purchased in Europe for as little as 25 cents a tablet. In the United States, the cost is over $2.00 a tablet.

Not only do Americans pay as much as eight-times more for their medication, but they often have to wait 10 to 20 years longer than Europeans to gain access to new drugs. Eldepryl was available in Europe in the 1970’s, but it was not “approved” by the FDA until 1989. That meant millions of Parkinson’s patients had to suffer and die even though an effective treatment was already available.

**THIS IS A NATIONAL EMERGENCY!**

Americans are suffering and dying from diseases that already have effective treatments. The FDA is illegally blocking your access to these safe and effective medical drugs.

When and if the FDA finally “approved” new therapies, they cost so much that there is now a health-care cost emergency in the United States.

**SPEAK UP...BEFORE AN ILLNESS BANKRUPTS YOU**

Only The Life Extension Foundation dares to challenge the FDA’s incompetent and corrupt prescription drug approval process.

The Life Extension Foundation will send you free information about highly effective medicines not approved by the FDA, but legally available to Americans. There are now thousands of useful medical therapies available in Europe and other parts of the world that the FDA is keeping from you.

We will also send you postcards to send to members of Congress which call for an investigation into the illegal and unconstitutional activities the FDA routinely commits against the American people. Call us at:

1-800-841-LIFE

or write:

THE LIFE EXTENSION FOUNDATION
PO Box 229120
Hollywood, FL 33022

(This ad is paid for by contributions from Americans who cherish their constitutional right to freedom of choice in healthcare matters)
To enlist as an activist to combat high drug prices log on to: LifeExtension.com/consumer

For longer life, 

William Faloon
Prescription drug spending is expected to rise to $1.3 trillion by the year 2018, up from only $326 billion in 2013.*

Who is going to pay for this?


Bloomberg—September 21, 2015

Price of 62-Year-Old Drug Jacked up by $736 a Pill

• Martin Shkreli is under criticism after raising the price of the anti-parasite medication Daraprim® from $13.50 to $750 per pill.

• Turing Pharmaceutical was founded in February 2015, bought the US marketing rights to the drug in August 2015, and hiked the price 55-fold in September 2015.

• Some people will now pay over $100,000 per year to stay alive.

Unsustainable

• Albuterol sold at an average market price of $11 for a bottle of 100 2 mg tablets in October 2013.

• By April 2014 the average price for albuterol sulfate jumped to $434.

• A price increase of over 4,000%.*


Price Gouging

• Divalproex Sodium ER is used to treat seizures and prevent migraines. This drug had an average market price in October 2013 of around $31 for a bottle of 80 tablets.

• By April of 2014, the price for the same drug rose to $234…a price increase of 736%.*

AS WE SEE IT

We’re All Being Defrauded

• A generic drug called tretinoin costs $1,100 per month.
• The active ingredient in this generic drug costs 80 cents.
• Consumers pay $1,100 for a bottle of 40, 10 mg tretinoin capsules.

Impact on Economy

• Pravastatin saw a price increase of 573% from October of 2013 to April of 2014.
• The increased cost to Americans is an additional $5.9 billion per year.*

DON’T BE SILENCED—LET YOUR VOICE BE HEARD!

To enlist as an activist against high drug prices, log on to: LifeExtension.com/consumer

(When you enlist as an activist, you can easily email the letter on the next page to your representative and two senators.)

References

Dear_______________________________________, (Name of your representative and two senators)


In many cases, prices charged to consumers for *off-patent* drugs are *hundreds of times* higher than what they cost to manufacture, yet generic companies are mysteriously failing to compete against one another.

This outlandish situation has been featured on *national news* stories, and there have been *Senate hearings* to investigate why this price gouging is occurring, but Congress has done *nothing* to stop it.

The solution to this problem is to amend the *Food, Drug, and Cosmetic Act* to allow a *free market* option for consumers to purchase generic drugs sold by reputable companies that are clearly labeled “*Not approved by the FDA.*”

This would give consumers the choice of purchasing medications that in some cases will be *more than 90% less expensive* than the current rip-off prices being charged by certain generic drug companies.

I urge you to introduce legislation that reforms the Food, Drug, and Cosmetic Act to enable GMP-certified (Good Manufacturing Practice) facilities to produce *generic prescription drugs* that do not have to undergo the excessive regulatory hurdles that force consumers to pay egregiously inflated prices for generic drugs.

The inevitable concern raised by this free-market solution is *safety*. Who will protect consumers from poorly made generic drugs?

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

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

Those companies who foolishly made inferior generics would be viciously exposed by the media, along with the FDA, consumer protection groups, and even prescribing physicians who would be suspicious if a drug were not working as it was supposed to.

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

Companies that produce inferior products would not only be castigated in the public eye, but would face civil litigation from customers who bought the defective generics. When one considers that GMP-certified manufacturing plants can cost hundreds of millions to set up, a company would be committing suicide if it failed to consistently produce generic drugs that at least met minimum standards.

I understand that no matter how many facts I list showing that these free-market drugs will be *safe*, there are some who believe that even if one person suffers a serious adverse event because of a defective generic drug, then the law should not be amended to allow the sale of these less regulated products.
What few understand is that enabling lower-cost drugs to be sold might reduce the number of poorly made drugs. The reason is that prescription drug counterfeiting is a major issue today. Drugs are counterfeit because they are so expensive. When a month’s supply of a common generic drug plummets to under $10, it is difficult to imagine anyone profiting by counterfeiting it. So amending the law to enable these super-low-cost drugs to be sold might alleviate the counterfeiting that exists right now.

Another reason these less regulated generics will do far more good than harm is that people who need them to live will be able to afford them. The media has reported on heart-wrenching stories of destitute people who cannot afford generic prescription drugs. They either do without, or take a less-than-optimal dose. The availability of these free-market generics will enable virtually anyone to be able to afford their medications.

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

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

The cost of prescription drugs is a significant contributing factor to today’s health care cost crisis, a problem that threatens to bankrupt consumers and this nation’s medical system. Passage of this common-sense legislation would quickly slash the cost of generic drugs so low that consumers could obtain them for less than what their copays currently are. This would save governmental and private health insurance programs, and ultimately consumers, enormous amounts of money.

Please don’t be influenced by pessimistic alarmists who claim that less regulation automatically means more dangerous drugs. These kinds of scare tactics have been used for decades to force Americans to pay outlandish prices for their medications. And please don’t be influenced by pharmaceutical lobbyists, who will do and say anything to protect their virtual monopoly over generic drug manufacturing.

The bottom line is that we as a nation can no longer afford to be bound by today’s inefficient regulatory system that artificially inflates the cost of our prescription medications. The money is no longer there to support this bureaucratic morass, and you know that as well as anyone.

Kindly let me know how you plan to implement this legislation that will help save this country from horrifically overpriced prescription drugs.

Sincerely,

Name:

Address:
Normal aging and related health issues can decrease production of digestive enzymes, resulting in a bloated feeling and other discomforts after eating a large meal.

Enhanced Super Digestive Enzymes provides specific enzymes required to support the natural reactions that break down food—demonstrated to optimize digestion and nutrient absorption. Here is the broad array of enzymes contained in this formula:

- **Protease** to help break down proteins,
- **Amylase** to break down starch and short sugar chains called oligosaccharides,
- **Lipase** to break down fats,
- **Cellulase** to break down the indigestible polysaccharide in dietary cellulose, and
- **Lactase** to break down lactose.

Enhanced Super Digestive Enzymes with Probiotics provides the same enzymes that are in Enhanced Super Digestive Enzymes—but with the added benefits of the probiotic *B. coagulans*.

This probiotic creates a natural protective shield that resists digestion in the stomach allowing it to fully colonize in the intestines. Probiotics such as *B. coagulans* support digestive health and suppress less beneficial bacteria to improve digestive comfort.

To order Enhanced Super Digestive Enzymes or Enhanced Super Digestive Enzymes with Probiotics, call 1-800-544-4440 or visit www.LifeExtension.com

References
RAAD FESTIVAL
The revolution against aging & death (RAAD) starts with you

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

Cognitive Function and Brain Cell Regeneration

The benefits of taurine on brain cell growth are especially evident in those with a taurine deficiency, which includes aging individuals.

Promising research has found that taurine can promote new brain cell formation in the area of the brain associated with learning and memory. It does so by activating hibernating stem cells that are capable of growing into several different kinds of cells.

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

Whole-Body Health

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, and
- Hearing function.

References

To order Taurine, call 1-800-544-4440 or visit www.LifeExtension.com
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 milligrams of boron in the daily dose of each of the following formulas:

- Two-Per-Day
- 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.

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**References**

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To order *Life Extension® Boron*, call 1-800-544-4440 or visit www.LifeExtension.com

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

Findings obtained from a trial reported in *Cancer Epidemiology, Biomarkers, and Prevention* reveal a previously unknown mechanism for aspirin in cancer prevention.*

Subjects received 325 mg aspirin or a placebo for 60 days. Using a technique known as metabolic profiling, levels of 363 metabolites involved in most human biochemical pathways were measured in all participants.

Cornelia Ulrich, PhD, and associates found that aspirin decreased levels of both forms of the onco-metabolite 2-hydroxyglutarate by 12% among the trial subjects and by up to 34% in colorectal cancer cell lines. (Increased levels of 2-hydroxyglutarate have been found in blood and brain cancers.) The researchers also determined that salicylate, the primary aspirin metabolite, inhibits an enzyme involved in 2-hydroxyglutarate production.

“It is really exciting that aspirin, which can work in colorectal cancer prevention, is now linked to a new pathway that has shown to be relevant for cancer formation,” commented Dr. Ulrich.

Editor's Note: It has been hypothesized that aspirin's anti-inflammatory and antithrombotic effects are behind its apparent ability to protect against some cancers. “This new study suggests that aspirin is playing a key role in interrupting multiple pathways that are linked to cancer development,” Dr. Ulrich stated. “Here we show both in the clinic and laboratory that a reduction in 2-hydroxyglutarate may identify a new mechanism for aspirin in cancer prevention.”

*Editor's Note: It has been hypothesized that aspirin’s anti-inflammatory and antithrombotic effects are behind its apparent ability to protect against some cancers. “This new study suggests that aspirin is playing a key role in interrupting multiple pathways that are linked to cancer development,” Dr. Ulrich stated. “Here we show both in the clinic and laboratory that a reduction in 2-hydroxyglutarate may identify a new mechanism for aspirin in cancer prevention.”

*Diabetes Care. 2015 Nov 30.

Testosterone Improves Insulin Sensitivity in Diabetic Men

*Diabetes Care* reported the outcome of a trial that revealed a beneficial role for testosterone treatment in male diabetics.*

The trial included 94 type II diabetic men, 44 of whom had low testosterone levels and reduced insulin signaling genes indicative of decreased insulin sensitivity. Participants with low testosterone received a weekly testosterone injection or a placebo for 24 weeks. Body weight, body fat, markers of inflammation, insulin sensitivity, and other factors were assessed before and after treatment.

At the end of the trial, men who received testosterone experienced an average loss of body fat of over six pounds and an equal increase in muscle mass. They also had lower levels of the inflammatory markers C-reactive protein (CRP), interleukin-1b, and TNF-α. “Most importantly, we saw a dramatic increase in insulin sensitivity, demonstrated by a 32% increase in the uptake of glucose by tissues in response to insulin,” lead researcher Paresh Dandona reported.

**Editor's Note:** “Testosterone treatment for men, where indicated, will improve sexual function and increase skeletal muscle strength and bone density,” Dr. Dandona noted. “This is the first definitive evidence that testosterone is an insulin sensitizer and hence a metabolic hormone.” This study corroborates what *Life Extension* has published for decades about the ability of testosterone replacement in male diabetics to improve insulin sensitivity and reduce inflammatory markers.

*Diabetes Care. 2015 Nov 30.
**Reduced Percentage of Deaths from Leading Causes over Several Decades**

The October 27, 2015, issue of the *Journal of the American Medical Association* featured an article titled “Temporal Trends in Mortality in the United States, 1969-2013,” that documents a decline in the age-standardized death rate from five out of six leading causes of death, including heart disease, cancer, stroke, unintentional injuries, and diabetes.*

A temporal trend refers to the long-term—in this case, a 44-year period—trend regarding death rates. A systematic and comprehensive evaluation of long-term trends in mortality is important for health planning and priority setting and for identifying modifiable factors that may contribute to the trends.

A team from the American Cancer Society in Atlanta analyzed data from the US National Vital Statistics System (NVSS) of the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention for the years 1969 through 2013. During this time period, the age-standardized death rate per 100,000 individuals declined from 1,278.8 to 729.8 for all causes, which is a 42.9% reduction. Deaths from stroke declined by 77%, from heart disease by 67.5%, for unintentional injuries by 39.8%, from cancer by 17.9%, and from diabetes by 16.5%.

**Editor’s Note:** Despite these gains, deaths from chronic obstructive pulmonary disease (COPD) increased by 100%, although they began to decline during the last time point analyzed.


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**Omega-3 Fatty Acids Decrease Risk of Rheumatoid Arthritis**

According to a study published in *Rheumatology*, those at risk of rheumatoid arthritis who consume more **omega-3 fatty acids** can decrease their likelihood of developing the disease.*

Rheumatoid arthritis is a systemic inflammatory disease affecting multiple joints in the body. It usually manifests in the lining of the joints (synovial membrane) but can impact other organs. Patients with rheumatoid arthritis have a higher prevalence of cardiovascular disease than those without.

Researchers analyzed self-reported data about omega-3 consumption from 30 people who had autoantibodies for rheumatoid arthritis and 47 control patients who did not. Just 6.7% of the patients who had the autoantibodies reported taking an omega-3 supplement, compared with 34.4% in the control group. Blood tests also showed that those with the autoantibodies were “significantly more likely” to have lower levels of three essential omega-3 fatty acids than the control patients. Two of the crucial omega-3 fatty acids, DHA and EPA, may suppress a protein that regulates the intensity and duration of the immune response.

“T here was a very substantial difference in the blood levels of omega-3 fatty acids between the people who took omega-3 supplements and those who did not,” said lead researcher Professor Jill Norris, PhD, of the Colorado School of Public Health.

**Editor’s Note:** This is the first study to find an association between omega-3 and the autoantibodies that lead to rheumatoid arthritis among patients who are at risk but have not yet developed the disease. Around 1.5 million Americans have rheumatoid arthritis. Women are 3 times more likely to develop it than men and prevalence appears to be increasing.


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**Vitamin E Delays Progression of Cellular Senescence**

An article appearing in *BioMed Research International* reveals new findings concerning the antiaging properties of **vitamin E**. In an experiment involving two types of human cells, treatment with vitamin E resulted in a delay in cellular senescence in comparison with untreated cells.*

Senescent cells are those that have reached a state of irreversible growth arrest by attaining a limited number of divisions. According to authors Giorgio La Fata and colleagues, cellular senescence in vitro is related to the aging of organisms in vivo.

The team tested the effects of vitamin E in cultured human umbilical vein endothelial cells and human fibroblast cells. The researchers found an increase in the number of senescent cells over time in both types of cells. However, short-term vitamin E supplementation was associated with a reduction in the percentage of senescent cells in comparison with untreated control cells.

**Editor’s Note:** “An important contributor to the development of the senescence process is oxidative stress,” Dr. La Fata and co-authors note. “Oxidative stress usually occurs when the production or the exposure to reactive oxygen species (ROS) overwhelms the antioxidant systems of the cells. Vitamins E and C are important natural antioxidants capable of neutralizing the deleterious effects of reactive oxygen species.”

### Ashwagandha Associated with Improved Sexual Function in Females

An article in *BioMed Research International* reveals the outcome of a study that found improvements in sexual function among women who received a highly concentrated *ashwagandha* (*Withania somnifera*) root extract.*

The study included 50 women diagnosed with female sexual dysfunction, which included hypoactive sexual desire disorder, female sexual arousal disorder, female orgasmic disorder, or combined genital and subjective arousal disorder. Twenty-five women received 300 mg ashwagandha twice per day with food and the remainder received a placebo for eight weeks. Sexual function (including desire, arousal, lubrication, orgasm, satisfaction, and pain), sexual distress, sexual activity, response to therapy, and tolerability of therapy were evaluated before treatment, and at four and eight weeks.

Women who received ashwagandha reported improved sexual function scores in the areas of arousal, lubrication, orgasm, and satisfaction. They also noted improvement in sexual distress and an increased number of successful sexual encounters by the end of the treatment period compared with the placebo.

**Editor’s Note:** As possible mechanisms, authors Swati Dongre and colleagues note that ashwagandha may reduce the effects of chronic stress (which interferes with sexual response) by lowering serum cortisol. Another possible mechanism is by “offsetting androgen deficiency syndrome, which is seen as contributing to a lack of sexual desire in some women” as suggested by the authors. In men, the herb has been shown to increase serum testosterone, which plays a role in sexual function in both genders.


### Magnesium Helps Prevent Amyloid Beta Aggregation in Experimental Research

The December 2015 issue of *The FASEB Journal* reports the ability of ionic magnesium (Mg2+) to help reduce the deposition of amyloid beta in an Alzheimer’s disease mouse model.*

Pu Wang, PhD, of Northeastern University in Shenyang, China, and colleagues tested the effect of magnesium threonate, which is believed to penetrate the blood/brain barrier, on normal mice and mice that overexpressed a gene that increased amyloid beta production while decreasing the influx of magnesium into the brain. Among those that received magnesium, the researchers observed a reduction in amyloid beta aggregation and associated cognitive decline, accompanied by an elevation in brain levels of ionic magnesium.

“We hope that our findings will help improve clinical practice pertinent to the optimal administration of Mg2+ for delaying or even preventing the onset of Alzheimer’s disease,” commented Dr. Wang.

**Editor’s Note:** Dr. Wang and colleagues “also hope to extend our experimental models to other disorders such as severe craniocerebral injury, bronchial asthma, chronic pulmonary heart disease, arrhythmia, and myocardial necrosis, etc. and identify more targets of Mg2+ and strategies for treating these disorders.”

* *FASEB J.* 2015 Dec;29(12):5044-58.

### Reduced Body Temperature Following Cardiac Arrest Associated with Survival

An article published in *Circulation* reports better survival and neurologic outcome among cardiac arrest patients who underwent therapeutic hypothermia compared to standard treatment. Cardiac arrest occurs when the heart stops pumping, and can be caused by heart attack or other conditions.*

Researchers at the University of Colorado utilized data from 519 men and women enrolled in the Penn Alliance for Therapeutic Hypothermia (PATH) Registry who survived cardiac arrest with nonshockable initial rhythms. Patients had experienced the return of spontaneous circulation and were comatose upon hospital admission. Subjects in the current study were treated with standard care or hypothermia, and were subsequently assessed for neurologic outcome.

The researchers, led by Sarah Perman, MD, uncovered a **2.8 times** greater likeliness of survival to hospital discharge and a **3.5 times** greater likeliness of better neurologic outcome among those treated with hypothermia in comparison with standard treatment. Life Extension Foundation funds a large hypothermia research project.

**Editor’s Note:** Nonshockable rhythms are defined as pulseless electrical activity and asystole, which are not treatable by defibrillation.

* *Circulation.* 2015 Nov 16.
Sirtuin1 or simply SIRT1 is a gene involved in the regulation of cellular energy metabolism and functions as a cellular supervisor by preventing DNA damage and regulating gene transcription. It has been observed that calorie restriction, a validated method of extending mean and maximum life span, increases the activity of SIRT1. Due to its ability to enhance SIRT1, which is called the longevity enzyme, resveratrol has been extensively studied for its wide array of benefits. Through the activation of SIRT1, resveratrol favorably regulates many other genes.

In studies involving diabetic mice, resveratrol has been shown to improve insulin sensitivity by inhibiting the protein tyrosine phosphatase 1B (PTP1B) gene. This particular gene has been shown to be activated in diabetics and it wreaks havoc on insulin signaling pathways. Cells have a limited functional life span. Once a cell wears out, the ideal mechanism of removal is through a healthy process of programmed cell death called apoptosis. If the dysfunctional cell does not undergo apoptosis, it lingers and emits pro-inflammatory signals that lead to degenerative illnesses.

Resveratrol can increase beneficial apoptosis to facilitate the healthy removal of decrepit cells. Resveratrol was shown to induce a critical cellular process called autophagy that removes waste (damaged proteins and organelles) from inside the cell. In a recent study, rats were given the toxic chemotherapy drug doxorubicin (Adriamycin®). Resveratrol, along with calorie restriction, was shown to inhibit the damage done to the hearts of these rats by inducing autophagy resulting in improved cellular waste removal. There is growing evidence that compounds like resveratrol can shield against chemotherapy-induced cellular damage.

Researchers have discovered a link between deactivation of SIRT1 and progeria, a condition that results in premature accelerated aging and markedly shortened life span. One study showed that mice with progeria given resveratrol had a 30% increase in median life span. The study also showed an increase in bone mineral density and a decline in potentially lethal atrophy. Scientists speculate that it would be interesting to test resveratrol on human progeria patients to see if it could slow the progression of this genetic disorder. Currently, there is no known cure and progeria patients typically die at about age 13.

Neuronal function is dependent on the continuous removal of dysfunctional proteins and mitochondria. Increase activation of SIRT1 by resveratrol contributes to a process called autophagy (removal of cellular debris such as misfolded proteins and dysfunctional mitochondria). The accumulation of these cellular waste products has been shown to be involved in neurodegenerative diseases such as Alzheimer’s and Parkinson’s. Evidence also shows resveratrol decreases damage caused by cerebral ischemia, thus reducing the adverse effects caused by diminished blood flow to the brain that occurs with aging.

In recent studies, resveratrol was shown to strengthen bone mass and inhibit bone demineralization. It does this by activating genes that signal our stem cells to turn into bone-forming cells called osteoblasts. In addition, resveratrol was shown in early studies to induce apoptosis (programmed cell death) of cells that break down bone, called osteoclasts, helping to preserve existing bone mass.

Over 10.2 million older adults have been estimated to suffer from osteoporosis, and these recent findings suggest resveratrol can be used as a therapy to resist age-related bone loss.

—Chancellor Faloon

References

How’s a $50 LE Dollar bonus sound to you?

We asked ourselves, “How can we give our customers more?” So we created Your Healthy Rewards Premier … a rewards program packed with great perks:

- **$50 BONUS**
  - GET a $50 LE Dollar enrollment bonus the moment you upgrade to Premier, as well as every year you renew. This bonus is instantly redeemable … which means Premier instantly pays for itself!

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  - ENJOY 1 year of unlimited CHOICE® pre-paid shipping to anywhere in the United States … including Alaska and Hawaii, absolutely free.

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  - EARN DOUBLE LE Dollars back on everything you buy … twice the 2% earned by regular Your Healthy Rewards customers.*

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Restore vital cellular energy with Life Extension®’s Rhodiola.

Prized for its potent adaptogenic properties, Rhodiola has long been used by elite athletes, soldiers, and even cosmonauts to enhance mental and physical stamina.

Scientific research shows that Rhodiola, an optimizing, adaptogenic herb supports:

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- Enhanced physical endurance²
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Life Extension®’s Rhodiola is uniquely standardized for adaptogenic compounds rosavins and salidrosides.

Life Extension® has formulated a Rhodiola Extract that provides 250 mg of Rhodiola rosea extract in each capsule.

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Caution: Individuals with manic or bipolar disorder should not use rhodiola. Take early in the day if Rhodiola Extract interferes with your sleep.

References

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

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Clinical data suggest that the proanthocyanidins found only in cranberries possess unique molecular features that specifically promote urinary system health.¹³

**Hibiscus Polyphenol Blend**

Life Extension’s Optimized Cran-Max® with Ellirose™ contains a unique compound that provides a synergistic complement to the whole cranberry’s phytonutrient profile.

Ellirose™ is derived from *Hibiscus sabdariffa*. Scientific analysis has shown that this species' flower and calyx (the green floral envelope surrounding the blossom) are rich in active polyphenols, including flavonoids, sambubiosides, and anthocyanins.

The suggested daily amount of Optimized Cran-Max® with Ellirose™ in this formula (500 mg) was demonstrated to provide the anthocyanin equivalent of seven 8-oz glasses of Ocean Spray® Cranberry Juice Cocktail.⁴

Non-GMO

References


These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
SAFELY REDUCE ANXIETY AND MOOD DISORDERS
Anxiety and mood disorders are now being recognized as major medical and societal issues.

In the United States alone, close to 48 million prescriptions were written in 2011 for the anti-anxiety drug Xanax®. One in 10 Americans takes an antidepressant medication.\textsuperscript{1,2}

In an alarming recent study, scientists found anxiety shortens telomere length and accelerates cellular aging. Put another way, uncontrolled anxiety may reduce one’s life span.\textsuperscript{3,4}

With millions of people medicated for mood disorders that include anxiety and mild depression, researchers have sought a safer way to reduce their impact.

In a unique discovery, two specific probiotic organisms have been identified that show impressive reductions in the manifestation of stress, anxiety, and depression.

Human studies on these two unique probiotics show notable results. For example, one study showed a 50\% decrease in depression scores while another showed a 55\% improvement in anxiety scores.\textsuperscript{5,6}

While it may seem remarkable that a probiotic can have effects outside of the gastrointestinal tract, a massive accumulation of data suggests that the gut is, in fact, practically a “second brain,” with a powerful and lasting impact on mood.\textsuperscript{7}
“Gut-Brain Axis”

Depression and anxiety are highly prevalent in the US (and around the world), affecting approximately 6.7% and 18.1% of Americans respectively.8,9

Until quite recently, these mental health disorders were viewed as primarily related to brain function, since it has long been believed that the brain is solely responsible for thoughts, feelings, and behavior.

There is an increasing awareness among scientists of the role played by the microorganisms that live in the gastrointestinal tract in affecting other body systems, including the brain.10 At nearly 100 trillion individual organisms, these cells outnumber the body’s own cells by 10 to 1, possessing nearly 100 times as many genes.11 That gives them a lot of leverage.

In fact, the close relationship between the microbes in the gastrointestinal tract and the biochemical functioning of brain cells and structures has given rise to the term gut-brain axis, indicating that what happens in the gut can affect the brain, and vice versa.12,13

Animal studies show that the makeup of organisms in the gastrointestinal tract (intestinal flora) can affect brain development in young animals, influencing specific behaviors such as anxiety.14,15 Conversely, early life stresses can change the makeup of the gastrointestinal flora, accompanied by increases in stress hormones such as cortisol, in immune system responses, and in intestinal pain sensations.16

Therefore, deliberately introducing changes to the gastrointestinal flora through supplementation with probiotics is an exciting new way to introduce changes in how the brain functions, including how people experience emotions.10,17,19

Animal Data

Studies show that mice with sterile gastrointestinal tracts that lack microbes have exaggerated responses to stress, with greater elevations in stress hormones like cortisol and its releasing hormone, adrenocorticotropic hormone (ACTH), compared with mice having intestinal microbes.

But when germ-free mice were inoculated with beneficial intestinal organisms, such as Bifidobacterium species, their stress responses were restored to normal levels. And when mice were inoculated with disease-causing E. coli organisms, their responses to stress worsened.14

A similar experiment showed that germ-free mice could be made to display increased anxiety-like behavior when their intestinal tracts were colonized with microbes from a strain of mice with high-anxiety behaviors. Conversely, administering organisms from normal mice to the high-anxiety animals reduced manifestations of anxiety, demonstrating the power of the microbial community to govern behavior.20

Physiological changes occur during stress, which can affect the gastrointestinal tract and impact the entire body through microbiological and hormonal influences.

In normal rats exposed to stress, for example, the intestinal lining became permeable or “leaky,” allowing bacteria and their toxic products to leak out of the gut, while levels of beneficial Lactobacillus organisms fell, indicating physiological effects of stress.

Probiotic supplementation with strains of Lactobacillus normalized those functional abnormalities of the gut and reduced high corticosterone levels, a hormonal indicator of systemic stress in rodents.21

Here are other mechanisms by which probiotics improve brain function:

- **Reduction in inflammatory cytokines** (signaling molecules) has been detected in animals supplemented with Bifidobacterium species.22 These cytokines are elevated in people with depression, so these reductions in inflammatory cytokines are indirect evidence of a depression-fighting effect.23-25

- **Balancing of hormones** and other signaling molecules in regions of the brain involved in maintaining the body’s physiological response to stress and behavior. This is suggested by the reductions of corticosterone and adrenocorticotropic hormone, as well as changes in intestinal permeability (ability to hold intestinal contents in place and not have them leak into the bloodstream).5,21

- **“Competitive exclusion”** of organisms that may produce toxic products influencing the brain has been proposed, based on the observation that some substances, such as lactic and propionic acid, produced to excess by “unfriendly” intestinal microorganisms, can induce increased anxiety and aggression.5,26,27 Thus, probiotic organisms that outcompete such toxin-producers might alleviate symptoms by lowering levels of intestinal toxins.
Reducing Anxiety, Depression, and Stress Safely

- Stress, anxiety, and depression affect millions of Americans.
- Mainstream medicine relies on costly medications, with only partial effectiveness and substantial side effects, in an attempt to manage these conditions.
- The recognition of the enormous role played by the intestinal flora, the community of microorganisms living in our intestines, has shifted attention to these organisms as potential partners in managing human mental illnesses.
- Changing the composition of the intestinal flora has been shown in animal studies to significantly affect behaviors and biochemical markers of stress, anxiety, and depression.
- The combination of Lactobacillus helveticus R0052 and Bifidobacterium longum R0175 was specifically developed with mental health in mind.
- This probiotic combination, in oral form, has been proven in human and animal studies to relieve symptoms of anxiety and depression, while demonstrating reductions in stress and anxiety-promoting hormones.
- For anyone currently using medication to manage symptoms of depression and/or anxiety, the new probiotic combination deserves a hard look, both for its effectiveness and for its safety.

These and other mechanisms contribute to the remarkable success of two specially selected strains of probiotic organisms in addressing mood issues, Lactobacillus helveticus strain R0052 and Bifidobacterium longum strain R0175. Both bacteria are derived from those commonly found in the human gastrointestinal tract, and which have known beneficial features. The combination of these organisms, each a unique strain developed for its effect on brain chemistry, is now proving effective, not only at changing markers of stress, but also at improving signs and symptoms of anxiety and depression, two of the most pressing mental health conundrums people face today.

Mechanisms of Probiotic Impact on Stress

High-quality, reliable animal models of stress, anxiety, and depression have been developed in the pursuit of chemical drugs to treat these conditions.28-31 In addition, various biochemical markers have been identified that can help indicate an animal's state of stress and its responses, which are useful in determining the effects of an intervention such as a drug or a supplement. These markers include hormones such as cortisol and the closely related corticosterone, both of which correlate with chronic stress, as well as epinephrine (adrenaline) and norepinephrine (noradrenaline), which indicate immediate stress and anxiety.

Such animal models have now been used to study the impact of the probiotic combination of Lactobacillus helveticus R0052 and Bifidobacterium longum R0175.
In a study of mice under chronic psychological stress, this unique probiotic combination showed anti-anxiety activity and reduced cell death in the emotion-processing parts of the brains of animals in a model of depression.32

For the study, mice were divided into two groups, one of which was exposed to a stressful situation and the other not. Blood levels of corticosterone and catecholamine neurotransmitters (such as epinephrine and norepinephrine) were elevated in the stressed group, and intestinal permeability (“leakiness”) was increased. This latter finding is suspected to play an important role in the brain changes associated with anxiety, depression, and a host of other diseases.33-35

Compared to placebo, pretreatment with the probiotic formulation attenuated those pathological responses, and reduced markers of stress, as follows:

- **Epinephrine** and **norepinephrine** levels fell beneficially by 28% and 51%, respectively, while corticosterone levels fell by 68%, all significant differences.

- Intestinal permeability dropped by 57% and levels of **occludin**, a protein found in intestinal “tight junctions,” was increased 2.1-fold, demonstrating a tightening of the “leaky gut” induced by stress.

- **Levels of the protein c-Fos**, a marker of stress at the cellular level in the brain, were reduced by 64% to 73% in brain areas critical to the stress response.

- There was a significant increase in **double-cortin**, a protein marker of new brain cell formation, in the hippocampus, the memory-processing region of the brain.

- There was a significant increase in **brain-derived neurotrophic factor (BDNF)**, a neuroprotective protein that encourages new synapse growth and differentiation.

In another study, a group of 36 mice were subjected to electric shocks to induce anxiety. The animals were divided into three subgroups, receiving either saline solution, the probiotic combination for two weeks, or a dose of valium an hour before administration of electric shocks.5 The animals were monitored for “defensive burying,” or attempts to bury the shocking electrode, a marker of anxiety.

Both the valium-treated and the probiotic-supplemented animals showed significantly decreased anxiety and stress compared with the saline-only group, demonstrating that this simple probiotic combination has similar anxiety-reducing properties to those of a well-established anti-anxiety drug.5

**Human Studies Show Dramatic Reductions in Anxiety and Depression**

Even high-quality animal models are limited in what they can tell us about any drug or supplement’s impact on human mood and behaviors. That’s why human randomized, placebo-controlled trials are so important. Such studies have now been carried out using the probiotic *Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175 combination.
A human study of 55 participants with mild depression or anxiety, ages 30 to 60, was conducted to determine the effects of the probiotic combination on anxiety, depression, stress, and coping strategies. Subjects were given 3 billion colony-forming-units (CFUs, a measure of the number of individual organisms) of the probiotic, or a placebo, for 30 days.

The probiotic-supplemented subjects had a significantly larger drop in measures of anxiety and depression than did placebo recipients as follows:

- 49% drop in the global severity index, a measure of overall psychological distress
- 50% decrease in depression scores
- 60% decrease in anger-hostility scores
- 36% decrease in the hospital anxiety and depression score (HADS)
- 13% decrease in urinary free cortisol, a hormonal measure of chronic stress, which was not seen in placebo patients

Supplemented patients also displayed reductions in self-blame and higher problem-solving skills after the study. Even people who don’t consider themselves “high-stress” may attain a serenity boost from this novel probiotic combination. When the same research team analyzed data on 25 original study participants whose baseline cortisol was below the median, indicating generally lower stress, they found that these individuals also experienced marked improvements in mood scores.

Another human study evaluated the impact of the probiotic combination on stress-induced digestive symptoms, a common manifestation of stress even in basically healthy people. Subjects ages 18 to 60, with at least two self-reported symptoms of stress (nervousness, irritability, anxiety, sleeping problems, gastrointestinal disturbances), were randomly assigned to receive either placebo or the probiotic combination at the same dosage as in the other studies.

Compared with placebo, supplemented subjects had a significant 7.6-fold greater reduction in stress-induced abdominal pain, and a significant 2.1-fold greater reduction in stress-induced nausea and vomiting. For many of us, these effects alone would make the supplement worthwhile!

**Summary**

Depression and anxiety are serious medical conditions that can be disabling, and in the case of depression and suicide, fatal.

Mainstream medicine relies on costly medications that attempt to correct the problems by creating new chemical imbalances. A safer and more natural approach is to identify ways to restore normal neurochemical and hormonal balances that will obviate the symptoms.

Supplementation with the probiotic combination of *Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175 is an evidence-based, biologically plausible approach to addressing symptoms of depression, anxiety, and stress. Studies show favorable biochemical and behavioral changes in animals treated with the probiotic, and sharp and significant decreases in symptoms of depression and anxiety in human trials.

For anyone experiencing anxiety and/or depression, regular supplementation with this probiotic combination seems a natural and worthwhile practice. It is conceivable that such supplementation could reduce reliance on prescription medications and deliver freedom from the burdens of these common mental illnesses.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.
References
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.\textsuperscript{1,2}

Chockfull of anthocyanins, the blueberry provides health-boosting benefits shown to:

- Enhance heart health\textsuperscript{4}
- Maintain brain function\textsuperscript{4,5}
- Sustain healthy blood sugar levels already within normal range\textsuperscript{6}
- Support smooth firm skin\textsuperscript{7}
- Maintain a healthy weight\textsuperscript{8} and stable cholesterol levels already within normal range\textsuperscript{9}

Blueberry extract is even more potent than the whole berry or juice, providing greater metabolic support throughout the entire body and without the excess sugar of raw fruit.\textsuperscript{10} Life Extension\textsuperscript{\textregistered}’s Blueberry Extract Capsules consist of only concentrated extracts from wild blueberries, which possess up to 10 times the antioxidant capacity of cultivated berries.

**Blueberry Extract Capsules**

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Suggested dose is one capsule one to four times daily, for most individuals.

**References**


Non-GMO

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

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

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

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ChromeMate®, a patented, biologically active oxygen-coordinated niacin-bound chromium complex, is a registered trademark of Interhealth Nutrionals Inc.

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Research suggests specific probiotics positively influence biochemical signaling between the gastrointestinal tract and the nervous system—resulting in positive effects on mood.¹

FLORASSIST® Mood provides 3 billion colony-forming units of Lactobacillus helveticus strain R0052 and Bifidobacterium longum strain R0175.

Human clinical research conducted on this dual-probiotic combination demonstrated improvements in mood, reduction in perceived stress, and promotion of relaxation.²,³

Two daily capsules of FLORASSIST® Mood naturally promote relaxation and improve mood.

FLORASSIST® Mood
Item #02000 • 60 capsules

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Contains milk and soybeans.

References
CURCUMIN: AGING BRAINS AND CANCER
Newly published data about curcumin continues to astonish scientists, physicians, and the lay public.

We’ve long known about curcumin’s many benefits, yet the news about this low-cost nutrient keeps growing stronger.

Curcumin, the active component of the spice turmeric, has a long history in Chinese and Indian medicine. Modern science has discovered that this ancient compound can drastically impact neurodegenerative diseases and cancer.¹⁻⁵

While neurodegeneration and cancer may seem unrelated, they have multiple mechanisms in common. These include dysfunctional chemical signaling in the cells and abnormal gene regulation, as well as a vulnerability to chemical stresses and inflammation.

In a remarkable finding, researchers have discovered that when mice were supplemented with curcumin, they experienced a significant increase in formation of new neurons, particularly in the memory-critical hippocampal area of the brain.⁶,⁷

Numerous studies have demonstrated curcumin’s ability to prevent underlying processes involved in Alzheimer’s disease.⁸ Perhaps even more exciting are studies showing that it may significantly modify many of the processes involved in the development of Alzheimer’s.⁹⁻¹¹

In addition, there is a growing body of literature documenting curcumin’s ability to treat and prevent cancer.¹²⁻¹⁴

These studies show not only the cancer prevention potential of curcumin, but also its ability to slow tumor growth when it occurs, and sensitize cancer cells to existing chemotherapy drugs.⁸,¹⁵⁻¹⁷

The importance of curcumin as a broad-spectrum shield against the impact of aging continues to be confirmed by the scientific community.
Curcumin and the Aging Brain

There are numerous factors that cause brains to age. These include the cumulative effects of oxidative stress, environmental toxins, inflammation, the buildup of toxic proteins, the loss of energy-generating power, and gradual damage to vital genes in individual cells.9,18,19

Animal experiments show that curcumin can help protect against these factors in the aging brain. For example, studies demonstrate curcumin’s ability to improve the management of cellular energy and to enhance cellular free radical protection systems. The result is reduced fat oxidation and decreased accumulation of toxic molecules that contribute to premature brain cell death.20

In addition, much of curcumin’s value in the aging brain may relate to its ability to turn on genes that trigger the emergence of new brain cells.10 This exciting discovery was demonstrated in a study of adult mice. When supplemented with curcumin, the mice experienced a significant increase in new neuron formation, particularly in the memory-critical hippocampal area of the brain.6

Evidence is also rapidly accumulating that curcumin plays a major role in protecting existing brain cells from the slow degradation that occurs in disorders such as Alzheimer’s and Parkinson’s diseases.10 As an added benefit, curcumin appears capable of minimizing the impact of acute catastrophes such as stroke and head trauma and chronic toxicity from alcohol.10

Let’s look more in depth at each of these brain-protective benefits.

Alzheimer’s Disease

In the search for a treatment or cure for Alzheimer’s disease, curcumin has emerged as a leading adjuvant contender. What this means is that curcumin may be one critical part of lifestyle changes, hormone modulation, and a nutrient cocktail that may reverse what the mainstream today considers incurable. More about how to reverse memory loss associated with Alzheimer’s disease will appear in the April 2016 edition of Life Extension® magazine.

Numerous studies have demonstrated curcumin’s ability to prevent the underlying processes involved in the disease. Perhaps even more exciting are studies showing that it may help modify some of these processes.9,11

These discoveries couldn’t have come at a better time. Alzheimer’s disease is currently the leading cause of dementia in older people, and the risk for developing it doubles with every five years we live past age 65.21,22

Table 1: Curcumin’s Anti-Alzheimer’s Mechanisms

Curcumin powerfully fights against the underlying causes of Alzheimer’s disease. Studies show that it directly binds to toxic beta amyloid proteins and prevents the formation of dangerous, inflammation-causing plaques. In addition, curcumin has been shown to have at least seven other mechanisms that minimize the formation of beta amyloid:

- It binds to metal ions that induce oxidative stress in brain cells and promote beta amyloid development.43,44
- It directly protects against oxidative damage, exceeding that of vitamin E, removing a major stimulus for beta amyloid formation.44,45
- It lowers cholesterol, which has been shown to limit beta amyloid plaque formation.46,47
- It reduces levels of pro-inflammatory signaling molecules (cytokines) that promote beta amyloid.25,48
- It limits oxidation of crucial fats and proteins that trigger the main enzyme involved in beta amyloid formation.10,25,26
- It promotes cleanup of existing beta amyloid deposits by brain macrophage cells.10
- It induces stress-responsive heat-shock proteins that protect brain cells from beta amyloid toxicity.49
Over 5 million Americans aged 65 and older have Alzheimer’s disease and it is expected to affect a staggering 13.8 million people by 2050. If there is any good news in all these statistics, it is the tremendous potential impact of prevention. Studies suggest that by simply delaying the onset of Alzheimer’s by an average of two years, we could prevent at least 2 million new cases in people over the age of 50.

That’s where curcumin comes in.

The reason curcumin is considered a critical component in the battle against Alzheimer’s is because it interferes with one of the root causes of Alzheimer’s itself: the formation and toxicity of the misfolded, abnormal protein called beta amyloid. When these protein pieces clump together, they form dangerous plaques that promote inflammation and contribute directly to brain cell death. This results in the loss of function, memory, and, eventually, one’s self.

Basic laboratory studies show that curcumin has tremendous potential to prevent the formation of amyloid plaques. In a remarkable study, scientists found that even at minute concentrations, curcumin has the ability to bind to beta amyloid, preventing it from accumulating into plaques. Studies show that curcumin easily enters the brains of living animals and inhibits formation of toxic beta amyloid plaques.

Animal models of Alzheimer’s disease have confirmed these results. Several studies have demonstrated that curcumin reduces the accumulation of beta amyloid and the dangerous inflammatory plaques that it forms. In addition, curcumin has been found to sharply reduce markers of oxidative damage and inflammation in the brain. And more importantly, when rats with Alzheimer’s disease are supplemented with curcumin, they have shown improvement in cognitive losses (such as memory and learning).

This next study is especially encouraging for those already suffering from Alzheimer’s disease. Published in the Journal of Biological Chemistry, the study found that curcumin suppressed beta amyloid and plaque formation in the brain, even when treatment was started after accumulations had reached levels similar to those of human patients. This makes curcumin a key nutrient with ability to reduce beta amyloid deposits.

In addition to directly binding to toxic beta amyloid and preventing plaque formation, curcumin has been shown to have at least seven other mechanisms that minimize the formation of beta amyloid. (These are outlined in Table 1.) All eight of these mechanisms are likely to be at work in an experiment in which specialized microscopy was used to study beta amyloid

### What You Need to Know

**Curcumin Battles Neurodegeneration and Cancer**

- Chemical stresses and disrupted biological signaling pathways are common to most symptoms of aging. These disruptions are especially prominent in the development of age-related brain degeneration, stroke, and other threats to our cognitive health, and also in the development of cancer.
- Curcumin, the primary constituent of turmeric, is an age-old spice used to combat many chronic disorders, which today are recognized as related to these disrupted pathways.
- Studies now reveal at least eight mechanisms by which curcumin can prevent or slow neurodegenerative diseases, stroke risk, and even damage induced by head trauma and alcohol abuse.
- Similarly, curcumin acts to oppose at least seven basic pathways leading to cancer development.
- Studies in the lab and on live animals demonstrate that curcumin leads to sharp reductions in the occurrence and severity of neurodegenerative disorders and of malignant growths.
- Those interested in opposing fundamental aging processes should take special notice of curcumin’s remarkable, multitargeted mechanisms capable of slowing and perhaps reversing cognitive decline and cancer risk.
changes that contribute to cell death, which produces Parkinson's symptoms.33

Curcumin’s anti-inflammatory properties are thought to be involved in protecting brain cells from premature death.10 Lab studies show that when curcumin is applied to brain cells in culture, it prevents alpha-synuclein from binding together, resulting in formation of fewer toxic plaques.33,34

Strokes and Cerebrovascular Diseases

Strokes and cerebrovascular diseases are major causes of death and disability. Fortunately, curcumin has multiple mechanisms of action that are beneficial against strokes such as suppressing inflammation while minimizing oxidative damage.

One study showed that curcumin treatment in rodents before and even up to 24 hours after induction of brain ischemia (loss of blood flow) reduced damage to vulnerable portions of the brain, preserved brain free radical defense systems, and mitigated behavioral changes induced by the stroke.35

Additional Neuroprotective Effects

Curcumin has been shown to protect brain tissue against the effects of acute head injury. Head trauma produces a sudden rush of oxidative stress and early inflammatory changes in the brain, and has also been shown to be a risk factor for Alzheimer's disease.10,36 Curcumin can combat these damaging effects.

Parkinson’s Disease

Parkinson’s disease is another common neurodegenerative condition. It is sometimes referred to as a “movement disorder.” As the disease progresses, cells in the brain regions involved in control of motor muscles begin to die off, leaving victims slow moving and off balance.27

Eventually, these symptoms can progress to include a nearly frozen state of hesitation in walking and a so-called “mask-like” expression. In many cases, Parkinson’s symptoms progress to include dementia, producing cognitive losses similar to those in Alzheimer’s.28

Currently, it is estimated that at least 1 million Americans suffer from Parkinson’s disease, with about 60,000 new diagnoses annually. Men are 1.5 times as likely to develop Parkinson’s.27

Curcumin fights many of the underlying processes involved in the development of Parkinson’s disease.

Parkinson’s disease occurs when dopamine-producing cells die in the region of the brain that controls movement (the substantia nigra). Oxidative damage contributes to the death of neurons in the substantia nigra.10,29 Curcumin’s powerful radical-scavenging properties and natural inhibition of inflammation make it a natural candidate for slowing these reactions. Indeed, it has been shown to provide significant neuroprotection and prevent chemical-induced changes in animal models.30-32

Curcumin also protects and supports the function of mitochondria, the intracellular “power plants” that release energy. When a potent mitochondrial toxin was applied to brain cells in culture, curcumin treatment protected the cells and prevented their death.30

Finally, as with Alzheimer’s disease, Parkinson’s is associated with accumulations of a toxic protein. Known as alpha-synuclein, this protein damages mitochondrial function and adds to neuronal oxidative stress levels. Alpha-synuclein also triggers inflammatory plaques in a mouse model of Alzheimer’s. This study demonstrated that curcumin enters the brain and then binds specifically to plaques, reducing their size by up to 30%.9

Unfortunately, most of us have already reached an age at which some beta amyloid has already formed in the brain, raising the risk for Alzheimer’s long before symptoms appear. This makes curcumin supplementation especially valuable, since it not only prevents plaque formation, but also reduces the toxicity of existing plaques. It does this by suppressing the pro-oxidant, pro-inflammatory, and gene-altering toxicity of beta amyloid in the brain.10
Curcumin Combats Tumors

Studies have shown curcumin's ability to battle three of the most common and deadly tumors: lung, colon, and prostate cancers.

In the first study, curcumin supplementation was supplied to strains of mice injected with cells from human non-small cell lung cancer, the leading cause of cancer-related death. Compared with mice fed a control diet, supplemented mice demonstrated a significant 36% reduction in the size of the lung tumors. In addition, their chances of survival increased nearly 3-fold.13

In the second study, curcumin supplementation significantly reduced by 40% the number of colon tumors in mice fed a high-protein diet, a known risk factor for colon cancer. The decrease in tumors was accompanied by significant drops in markers of inflammation (a known promoter of cancer growth) and by slowed proliferation rates of colon cells. These actions are likely the reason for the reduction in tumors.12

In a mouse model of colon cancer, curcumin supplementation completely eliminated tumors, increased survival, and demonstrated microscopic improvements in the animals' colons.8

Finally, in mice bearing human prostate cancers, 30 days of curcumin supplementation significantly reduced the tumor volume and weight by inhibiting cancer cell growth. The mechanisms appeared related to curcumin's up-regulation of genes that inhibit tumors, and down-regulation of genes that promote tumors.14

Curcumin Slows Progression of Fast-Growing Cancers

A rapidly growing and poorly differentiated (higher grade) cancer can be distinguished by its high rate of new blood vessel formation (angiogenesis). Curcumin has been shown to significantly slow the growth of these dangerous tumors by reducing the numbers of new blood vessels they form.39

Curcumin has also been found to slow the growth of prostate cancer. In mice bearing human prostate cancers injected under their skin, curcumin supplementation significantly inhibited initial tumor growth by 27%, compared with unsupplemented controls.

There were two reasons for this. First, the animals treated with curcumin had significant reductions in their expression of androgen receptors. Those receptors, when stimulated by testosterone and other male hormones, promote tumor growth. Second, supplemented animals had a 2-fold increase in the time it took for their levels of prostate-specific antigen (PSA, a marker of tumor progression) to double. This is a further indication of the deceleration of cancer development.40

Curcumin and Cancer

Curcumin has at least seven mechanisms by which it fights cancer from its earliest stages of development. These are outlined in Table 2 on the next page.

This type of multilayered protection is essential in fighting cancer because cancer is a highly multifactorial process. As shown in Table 2, curcumin has been found to attenuate all stages of tumor progression. This makes it one of the most powerful natural compounds in the fight to prevent cancer; to slow its growth when it occurs, and even to sensitize cancer cells to existing chemotherapy drugs.8,15-17

A growing body of literature is documenting curcumin's ability to treat and prevent cancer, especially in advanced animal models of malignancy. Here are some of the highlights.
Curcumin Reduces Cancer-Promoting Conditions

Gastritis is inflammation of the stomach lining that has been linked to stomach and esophageal cancers. A common cause is infection by the *Helicobacter pylori* bacteria.41

One study found that when mice infected with *Helicobacter pylori* were treated with curcumin, it resulted in a complete absence of inflammation. This is critical because preventing *H. Pylori*-induced inflammation is an important step in preventing these types of cancers.42

As an added benefit, curcumin supplementation enhances bacterial richness and diversity in the colon, a key to maintaining good digestive health. Studies in mice show that curcumin supplementation shifts the abnormal profile of organisms in colon cancer-bearing mice back towards that of healthy mice.8

### Table 2: Curcumin and Cancer-Prevention Mechanisms

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<th>Curcumin’s Preventive Properties</th>
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<td>DNA damage to genes regulating cell replication50</td>
<td>• Prevents DNA damage by toxins, radiation, and other environmental factors51-53</td>
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<tr>
<td>Loss of normal growth control leads to out-of-control reproduction of malignant cells54,55</td>
<td>• Restores normal growth controls, reducing viability and replication rate of malignant cells15,56-59</td>
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<tr>
<td>Evasion of normal immune system surveillance to find and destroy malignant cells17</td>
<td>• Reveals cancer cells to immune surveillance, improving detection and destruction of malignant cells17</td>
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<tr>
<td>Induction of new aberrant blood vessels to fuel tumor growth63</td>
<td>• Inhibits new blood vessel growth by blocking vascular growth factors99</td>
</tr>
<tr>
<td>Overproduction of “protein-melting” enzymes allows cancer cells to penetrate tissue to invade local sites64</td>
<td>• Inhibits local invasion by blocking protein-melting enzyme actions,65 and by interfering with cancer-associated fibroblasts, the cells that assist malignant growth66</td>
</tr>
<tr>
<td>Persistence of cancer stem cells resistant to chemotherapy and radiation, allowing treated tumors to regrow16,59,67</td>
<td>• Reduces cancer stem cell survival and sensitizes them to chemotherapy, making tumors more vulnerable to existing treatments16,59,67</td>
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<td>Seeding of new distant tumors (metastases) from original mass promoted by specialized adhesion molecules allows malignant tissue to stick to vessel walls and set up new tumor68</td>
<td>• Reduces production of adhesion molecules used to stick to vessel walls69</td>
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<tr>
<td></td>
<td>• Speeds up cancer cells that roll along vessel walls, reducing ability to settle and form mature metastases69</td>
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Summary

Neurodegenerative diseases and cancer may seem unrelated. In reality, they are deeply connected at the cellular and molecular levels. Both processes involve inappropriate or abnormal responses to normal biochemical signaling pathways, resulting in loss of cellular function.

In neurodegenerative diseases, strokes, and other problems in the aging brain, such loss of control leads to cell death and results in cognitive decline. In cancer, that loss of control leads to just the opposite: unregulated cell growth and replication.

Curcumin, derived from the spice turmeric, has a long history as a powerful protectant against disorders we now recognize as being driven by this kind of loss of cellular regulation.

Modern studies reveal that curcumin can directly oppose at least eight of the fundamental causes of age-related brain degeneration. This has led to promising progress in the fight against Alzheimer's and Parkinson's diseases, stroke, head trauma, and even alcohol abuse.

At the same time, studies show curcumin can reverse at least seven known cancer-promoting processes, leading to remarkable cancer-preventive properties.

All of this evidence suggests that curcumin is a versatile anti-aging compound.

References


51. Eke D, Celik A. Curcumin prevents perfluorooctane sulfonate-induced genotoxicity and oxidative DNA damage in rat peripheral blood. Drug Chem Toxicol. 2015;38:7-17.


MAXIMIZE YOUR OMEGA-3 BENEFITS

Omega-3 fatty acids support heart health, brain health, eye health, mood, the immune system, and much more.

Life Extension®’s Super Omega with Krill, Astaxanthin, & Olive Extract is a unique formulation containing 5 key ingredients that work together to maximize the protective benefits of omega-3s.

KRILL AND FISH OIL
Scientists suggest that combining fish oil and krill oil may provide enhanced benefits for the cardiovascular and nervous system due to the different ways that fish oil and krill oil are taken up by our cells.1,2

OLIVE EXTRACT
Olive polyphenols improve blood lipids and endothelial function that support arterial health along with other cardiovascular benefits.3,4

The daily dose of Super Omega provides the equivalent polyphenol content of 4 to 6 tablespoons of extra virgin olive oil.

ASTAXANTHIN
In Super Omega, the natural astaxanthin content of krill is fortified with additional astaxanthin for maximum stability and benefit.

Astaxanthin fights free radicals,6 boosts mitochondrial function,4 supports brain,5,6 cardiovascular,7,8 and DNA10,11 health, and supports healthy blood sugar levels for those already in the normal range.1,12

SESAME LIGNANS
The Super Omega formula contains standardized sesame lignans that guard against lipid peroxidation, thereby extending the stability of DHA in the body.13,14

To order Super Omega with Krill, Astaxanthin, & Olive Extract, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Discover a European Secret for Beautiful Legs

Combat Unsightly Veins

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

1. Supporting healthy blood flow.

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

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References

Caution: If you are taking anticoagulant or antplatelet medications, or have a bleeding disorder, consult your health care provider before taking this product.

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

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**Enhanced Support for Healthy Inflammation Response**

**SUPER Bio-Curcumin**

Super Bio-Curcumin® features BCM-95®, a patented curcumin that absorbs up to 7 times better than standard curcumin, making this product ideal for those seeking to:

- Inhibit the pro-inflammatory effects of NF-kappaB activation,
- Inhibit the pro-inflammatory activities of cyclooxygenase, lipoxygenase, and cytokines,
- Support normal cell-cycle growth,
- Maintain immune system health,
- Promote healthy brain function,
- Help maintain normal, healthy platelet function,
- Support natural defenses against estrogen-mimicking chemicals, and
- Benefit joint health and bowel function.

Life Extension® also provides Advanced Bio-Curcumin® with Ginger & Turmerones for those seeking the additional benefits of added ginger:

- Nearly twice the support for a healthy inflammatory response,
- Nearly twice the immune health support, and
- About twice the free radical fighting support.

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**References**


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**Super Bio-Curcumin®**

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To order Super Bio-Curcumin® or Advanced Bio-Curcumin® with Ginger & Turmerones, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
PREVENT GOUT ATTACKS
Gout is a kind of arthritis that can cause an attack of sudden burning pain, stiffness, and swelling in a joint. This often occurs in the big toe. Gout attacks can happen over and over unless properly treated. Over time, this disorder causes harm to joints, tendons, and other tissues.

Gout is caused by high concentrations of uric acid in the body. This condition leads to the creation of crystals in joints and tissues. Aside from pain so excruciating that some of the 8.3 million US sufferers often cringe at the thought of putting a sheet over their foot at night, gout is associated with higher risks of cardiovascular disease and mortality.

Drugs such as allopurinol and probenecid are typically used to help reduce uric acid levels, but the side effects can include breathing difficulties, unusual bleeding, vomiting, nausea, and severe rash. These drugs may also interfere with other medications.

Fortunately for gout sufferers and those with uric acid buildup, scientists have demonstrated the effectiveness of a natural alternative with a strong history of traditional Ayurvedic use and no reported side effects. Derived from the edible fruit of the *Terminalia bellerica* tree, this tannin-rich extract is believed to inhibit xanthine oxidase, an enzyme involved in the synthesis of uric acid.

A randomized, double blind, and placebo-controlled human clinical trial has recently confirmed the dose-dependent action of *Terminalia bellerica* extract in decreasing blood levels of uric acid. In volunteers with elevated levels, one capsule of 500 mg of *Terminalia bellerica* extract, taken twice daily, decreased uric acid by a mean of 27.59%.

This decrease in uric acid levels enabled 88.8% of the people in the study arm taking the extract to achieve targeted uric acid serum levels...with no side effects.
About 5% to 8% of adult males have asymptomatic hyperuricemia. Uric acid levels above 8.6 mg/dL in men or 7.1 mg/dL in women are classified as hyperuricemia (although some laboratories and research groups use different limits). When the serum uric acid level is greater than 9.0 mg/dL, the probability of developing clinical gout is 6 times higher. A gout attack can be triggered at any time by a range of factors, including alcohol, certain medicines, other illnesses, or stress.

Those whose uric acid is increasing due to age and other factors need to take action to reduce these levels before they suffer a gout attack or even develop cardiovascular/kidney disease.

Targeting Xanthine Oxidase Enzyme

Until now, people with hyperuricemia haven’t had many options. The drugs available to reduce uric acid buildup come with extensive and potentially deadly side effects. One of the most common side effects of the gout medication febuxostat is liver problems, but according to this drug’s own manufacturer, “A small number of heart attacks, strokes, and heart-related deaths were seen in clinical studies.” Other common adverse effects include diarrhea, nausea, headache, rash, and ironically, joint pain and gout flares!

Another drug option is allopurinol. However, it was recently found that this prescription does not always decrease serum uric acid. And both allopurinol and the uric acid-lowering drug probenecid are associated
with side effects ranging from breathing difficulties to unusual bleeding.5-7

Scientists seeking a natural way to lower uric acid conducted research on the fruit of the *Terminalia bellierica* tree, which has been used in Ayurveda medicine for many years, mainly for removal of kidney stones and inflammation. Researchers studied an extract that was derived from this edible tree fruit that contains 15% tannins. This extract and its potent tannins appears to inhibit an enzyme involved in the synthesis of uric acid, *xanthine oxidase*.8 Excess xanthine oxidase generates high levels of *uric acid* and can create crystals in joints and tissues, leading to gout.

In addition to inhibiting the manufacture of uric acid and therefore, the inflammation of gout, the bioactive compounds in *Terminalia bellerica* are believed to provide anti-inflammatory effects, possibly due to inhibition of *inducible nitric oxide synthase* (iNOS). Researchers reported *Terminalia bellerica* to be effective against problems involving painful or burning urination, urine discharge, bleeding in the kidney, and inflammation. It is also helpful with the removal of blocked urine and kidney stones.8,23

A placebo-controlled, human clinical investigation was needed to determine the therapeutic ability of *Terminalia bellerica* in patients with hyperuricemia or gout, and most critically, to specifically assess the extract’s side effects relative to the very serious side effects of drug therapy.

**Uric Acid Reduction in a Landmark Clinical Trial**

Scientists conducted a well-designed, long-term human study to compare the effectiveness of extracts from the fruits of two different species of the *Terminalia* tree with each other and with a drug commonly used to treat hyperuricemia.8

In this randomized, double-blinded, placebo-controlled, parallel-group study, 110 volunteers with hyperuricemia were divided into five separate groups and evaluated over 24 weeks. Their uric acid levels, other health indicators, and side effects were assessed before treatment and at follow-up visits at four weeks, eight weeks, 12 weeks, 16 weeks, 20 weeks, and 24 weeks of therapy. In other words, at each visit, they were evaluated for both efficacy and safety.

Safety, a key element of the study due to the potentially deadly side effects of all the drug options for hyperuricemia, was assessed both by patient questioning at each of the six visits and by a thorough lab analysis of hematological, hepatic, and renal biochemical parameters at the outset and at 24 weeks. Each participant was given a contact number for reporting What You Need to Know

**Lowering Uric Acid Levels**

- High uric acid concentrations can deposit crystals in joints and tissues, triggering the excruciating pain of gout, which is linked to greater risks of cardiovascular disease and mortality.
- Drug treatment for gout may cause serious side effects such as breathing difficulties, unusual bleeding, and vomiting, and these drugs may interfere with other medications.
- In a landmark human trial, scientists demonstrated the effectiveness of *Terminalia bellerica*, which reduces serum uric acid buildup without reported side effects. This extract appears to inhibit xanthine oxidase, an enzyme involved in the synthesis of uric acid.
- Twice-daily capsules of 500 mg of *T. bellerica* extract decreased uric acid levels by a mean of 27.59%, without adverse side effects.
A Side Effect-Free Option for Hyperuricemia

The research team recorded an average reduction in uric acid levels at each of the six follow-up visits for all treatment groups except the placebo group, which showed an erratic but overall increase in uric acid over the 24 weeks.

The average absolute uric acid readings decreased over the course of the study by:

- 1.34 mg/dL in the 500 mg *Terminalia chebula* group,
- 2.29 mg/dL in the 500 mg *Terminalia bellerica* group,
- 1.17 mg/dL in the 250 mg *Terminalia bellerica* group, and
- 4.25 mg/dL in the 40 mg febuxostat drug group.

Expressed as mean percentage decreases in uric acid over 24 weeks, levels decreased by:

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

The percentage of patients who achieved the target serum uric acid level of 6 mg/dL or less at the end of 24 weeks was:

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

Clearly, almost nine out of 10 volunteers who took 500 mg of *T. bellerica* twice daily achieved the target uric acid level of 6 mg/dL, while just over two out of 10 patients who took an equal dose of *T. chebula* reached this goal. A full 10 out of 10 subjects who took the drug febuxostat realized the target of 6 mg/dL, but the drug option has known serious and potentially lethal adverse effects that are difficult to identify in a 24-week trial. However, early adverse effects from this drug were observed even within the period of the study.
Terminalia bellerica is believed to inhibit xanthine oxidase, an enzyme involved in the synthesis of uric acid from xanthine, and in a dose-dependent manner. Its mechanism is similar to that of the gout drug allopurinol.

**Terminalia Bellerica Inhibits the Formation of Uric Acid**

Terminalia bellerica is a natural Ayurvedic alternative with no reported side effects, to reduce serum uric acid. This tannin-rich extract appears to inhibit xanthine oxidase, an enzyme involved in uric acid synthesis.

In volunteers with elevated uric acid levels, twice-daily capsules of 500 mg of T. bellerica extract decreased uric acid levels by a mean of 27.59%, with absolutely no adverse side effects.

This decrease in uric acid levels enabled 88.8% of the people in the study arm taking the extract to achieve targeted uric acid serum levels.

Comprehensive blood test panels that most Life Extension® supporters have performed annually reveal uric acid levels. An ideal uric acid range is slightly less than 6 mg/dL.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.
Mean Percentage Change in Serum Uric Acid Levels by Treatment Agent

In group B, 500 mg of T. bellerica reduced serum uric acid levels by a mean of 27.59% without any of the side effects observed in group D, which took febuxostat, or in gout patients within the general population who take febuxostat. The manufacturer of febuxostat does not endorse its use in hyperuricemia patients who have not yet progressed to having gout.

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:\(^1,^2\)

- Maintain normal muscle and nerve function.
- Keep heart rhythm steady.
- Support a healthy immune system.
- Keep bones strong.
- Maintain blood sugar levels already within normal range.
- Promote normal blood pressure. Magnesium is also...
- Involved in energy metabolism and protein synthesis.

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!

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

References

MAGNESIUM CRITICAL FOR WHOLE-BODY HEALTH

To order Magnesium Caps, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
DHEA is a critically important hormone, but its production declines sharply as we age. By the time you reach 70, your DHEA levels are likely to be 75-80% lower than when you were at your peak.1-4

Scientists are discovering numerous health benefits when aging people restore their DHEA to youthful ranges. DHEA therapy has been shown to:

- Support healthy arterial structure and function5,6
- Support endothelial health by helping with blood flow7
- Promote insulin sensitivity8,9
- Benefit the normal aging brain10,12
- Improve mood and alleviate melancholy13
- Protect hip bone and spine bone mineral density14
- Enhance the increases in muscle mass and strength in the elderly with resistance exercise15
- Boost a broad array of immune system cells and signaling molecules16

By supplementing with DHEA, you can get your levels back to youthful values. An ideal daily dose of DHEA for many healthy aging people is 25 mg. Life Extension’s® convenient, economical 25 mg capsules are a popular way to consume the precise amount of DHEA your body may need.

DHEA 25 mg
Item #00335 • 100 capsules

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Each bottle lasts a typical user over three months!

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

CAUTION: Do not use DHEA if you are at risk for or have been diagnosed as having any type of hormonal cancer, such as prostate or breast cancer.

Non-GMO
Support Healthy **Uric Acid** Levels

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

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

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

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

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

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**Uric Acid Control**  
Item #01921 • 60 vegetarian capsules

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To order **Uric Acid Control**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.*
Tri Sugar Shield® contains three active ingredients—Sorghum, Mulberry Leaf, and Phloridzin—that help support glucose metabolism by promoting:

- Beneficial glucose metabolism in the liver
- Insulin sensitivity and favorable blood glucose transport in cells and tissues
- Favorable balance of enzymes in the digestive tract and kidneys involved in the control of glucose
- Moving glucose out of the blood and into muscles and the liver
- Healthy absorption of glucose from the bloodstream into muscle cells

References

Non-GMO.
Caution: If you are taking blood glucose-lowering medication, consult your health care provider before taking this product.
There’s been a resurgence of interest in the anxiety-relieving powers of L-theanine, an amino acid found in green tea.1

Discoveries over the past two years have uncovered exciting additional properties of this nutrient best known for inducing calming, tranquilizing effects while simultaneously improving alertness.

In this Research Update, we examine how L-theanine acts in the brain, and review compelling new studies on its actions that include potentially reduced risk of stroke and less brain damage if an ischemic stroke were to occur.

Brain Benefits of L-THEANINE

L-theanine relieves anxiety in large part because it bears a close resemblance to the brain-signaling chemical glutamate. L-theanine produces the opposite effect in the brain.

While glutamate is the brain’s most important excitatory neurotransmitter, L-theanine binds to the same brain cell receptors and blocks them to glutamate’s effects. This action produces inhibitory effects.1,2 That inhibition to brain overactivity has a calming, relaxing effect in which anxiety fades.3

In addition to blocking excitatory stimuli at glutamate receptors in the brain, L-theanine also stimulates production of the inhibitory, relaxing neurotransmitter GABA, adding to its calming, anti-anxiety effects.2

Unlike prescription anti-anxiety drugs, however, some of which mimic GABA’s effects, L-theanine produces its anti-anxiety effects without producing sleepiness or impairing motor behavior.4 In fact, L-theanine has been shown in human studies to moderately improve alertness and attention while exerting its anxiety-reducing effects.5
Of particular interest are studies showing that L-theanine supplementation prevents the abrupt rise in blood pressure that some people experience under stress. The reason this is so critical is that many people have normal blood pressure readings at rest that spike up to dangerously high levels when subjected to stressful situations.

These periods of surging blood pressure inflict massive arterial damage and are the main reason why at-home and at-office blood pressure testing are so important.

**New Directions for L-Theanine**

Scientists are now increasingly interested in applications for L-theanine far beyond its anti-anxiety properties. Excessive glutamate stimulation of brain cells (excitotoxicity) is a factor in development of long-term neurodegenerative disorders, stroke, and schizophrenia. Therefore, L-theanine’s glutamate-blocking capabilities make it promising for neuroprotection and prevention in these areas.

And while its deeper mechanisms are still under investigation, there is tantalizing evidence that L-theanine influences expression of genes in brain areas responsible for fear and aggression (amygdala) and memory (hippocampus), helping to balance the behavioral responses to stress, and potentially improve conditions such as mood disorders, post-traumatic stress disorder (PTSD), and substance dependence.

**L-Theanine Protects Brain Cells and Promotes Cognitive Function**

There’s a link between anxiety, reaction to stress, and the brain’s most fundamental function, maintaining cognition. Studies over the past two years suggest a potential role for L-theanine in supporting cognitive function and preventing its loss.

Stress has powerful negative effects on one’s ability to think clearly and make smart decisions. This is demonstrated physiologically by animal experiments showing that stress significantly reduces animals’ performance on standard tests of learning and memory, as well as by increased oxidative stress in the brain and elevated blood levels of stress-response hormones such as catecholamine and adrenaline. Treating animals with L-theanine before the stress is applied, however, results in reversal not only of cognitive impairment, but also of the elevation of stress hormones and oxidative damage.

Studies such as these demonstrate that L-theanine can specifically reduce the molecular impacts of acute stress, and the resulting excitotoxicity, on brain cells. The issue with chronic glutamate-driven excitotoxicity is profound and long-lasting cognitive dysfunction, including neurodegenerative diseases such as Alzheimer’s, Parkinson’s, Huntington’s diseases, and amyotrophic lateral sclerosis (ALS).

The protective effects of L-theanine have been shown in animal models for at least the first three of these disorders, suggesting that regular L-theanine supplementation might be important in fending off these tragic conditions by opposing the destructive effects of long-term glutamate excitotoxicity.

In a rat model study for Huntington’s disease, researchers investigated the protective effects of L-theanine against 3-nitropropionic acid (3-NP). Rats exposed to 3-nitropropionic acid experienced significant reductions in body weight, oxidative defenses, and locomotor activity, as well as impaired mitochondrial enzyme activity. But when exposed to L-theanine, the behavioral, biochemical, and mitochondrial enzyme activities were significantly attenuated, leading authors to conclude that “L-theanine has neuroprotective activity against 3-nitropropionic acid induced neurotoxicity.”

Exposure to toxic chemicals is another known risk factor for many of the neurodegenerative disorders, with the metal aluminum being a major culprit. Recent studies show that L-theanine is capable of preventing both the biochemical and structural damage to brain cells induced by aluminum, offering yet another means by which this nutrient can prevent or slow cognitive decline.
L-Theanine May Play a Role in Ameliorating Schizophrenia

Schizophrenia, literally a “split mind” in which sufferers experience a cut-off from reality, is one of the most tragic and misunderstood disorders known. People with schizophrenia may experience positive symptoms such as hallucinations, delusions, and paranoid thinking, as well as negative symptoms including loss of ability to experience pleasure, blunted emotions, and diminished speech capacity.26

Perhaps because schizophrenia may involve excitotoxic damage to brain cells, L-theanine has recently been the focus of human studies in patients with this disease.27 In one study of 40 patients with schizophrenia, subjects were given placebo or 400 mg L-theanine along with their regular medications for an eight-week trial. The supplemented patients demonstrated significant reductions in their anxiety and general symptoms of psychopathology.28

A 250 mg per day dose of L-theanine significantly improved, in a different study scores on positive symptoms, as well as in sleep quality.29 And the combination of L-theanine (400 mg per day) with the hormone pregnenolone (50 mg per day) was capable of reversing not only anxiety, but also negative symptoms.30

**Summary**

L-theanine, an amino acid found in green tea, reduces anxiety by blocking excitatory stimuli at glutamate receptors in the brain while stimulating production of the inhibitory, relaxing neurotransmitter GABA. But unlike prescription...
anti-anxiety drugs, L-theanine relieves stress without causing drowsiness or impairing motor behavior. In fact, studies show it improves alertness and attention. Researchers are now examining L-theanine’s applications beyond its anti-anxiety effects. Studies suggest a role for L-theanine in supporting cognitive function and preventing cognitive loss by protecting brain cells and preventing strokes and reducing the damaging effects if a stroke has occurred. Lastly, L-theanine is the subject of human studies in patients with schizophrenia.

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

References


LIFE EXTENSION | MARCH 2016 64
Advanced Olive Leaf Vascular Support with Celery Seed Extract is a unique, dual-action formulation containing two bioactive compounds that support optimal cardiovascular health.

1. Olive leaf extract contains oleuropein, a natural compound that supports healthy blood pressure already within the normal range.

Researchers using 1,000 mg per day of olive leaf extract in a controlled clinical trial documented an average 11 mm Hg decline in systolic readings and a 4.8 mm Hg drop in diastolic readings within eight weeks!1

2. Celery seed extract contains 3-n-butylphthalide (3nB), which supports a healthy inflammatory response that is critical to maintaining a healthy circulatory system.2 Celery seed also helps minimize the flow of calcium into the muscle cells lining blood vessels, promoting healthy blood pressure already within the normal range.3,4

In a controlled clinical trial, researchers using an equivalent amount of active compounds as found in this celery seed extract documented an average 8.2 mm Hg decline in systolic readings and 8.5 mm Hg drop in diastolic readings—in just six weeks!5

While olive leaf and celery seed extracts show impressive support individually, Advanced Olive Leaf Vascular Support with Celery Seed Extract combines two bioactive compounds to provide dual-action vascular support.

To order Advanced Olive Leaf Vascular Support with Celery Seed Extract, call 1-800-544-4440 or visit www.LifeExtension.com

References
1. Phytother Res. 2008 Sep;22(9):1239-42.

Non-GMO

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.
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,
- Magnesium,
- Manganese,
- Zinc,
- Silicon, and
- Vitamin K₂ (long-acting MK-7 form).

Vitamin K₂ is essential to maintain skeletal integrity.

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**Bone Restore with Vitamin K₂**
Item #01727 • 120 capsules

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

To order **Bone Restore with Vitamin K₂**, call 1-800-544-4440 or visit www.LifeExtension.com

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Non-GMO

Note: Those taking anticoagulant drug Coumadin® (warfarin) should use Bone Restore without K₂.

Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049.

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

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

The L-Theanine in this product:

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

Non-GMO

References
News Reports around World Describe Multiple Benefits

The media has caught up to the potential health benefits of metformin, something our long-term supporters discovered long ago.

What caught the media’s attention was the FDA’s approval of the first human study to see if metformin can protect against the multiple diseases of aging.

Prominent headlines around the world proclaimed:

“New Anti-Aging Drug Could Extend Human Life Span to 120 Years”

Metformin of course is not a new drug. It was approved in England in 1957 and made available to type II diabetics around the world shortly thereafter. It took the FDA a staggering 37 years to approve it in the United States.

Here are some accurate quotes from worldwide news sources:

“Although it might seem like science fiction, researchers have already proven that the diabetes drug metformin extends the life of animals, and the Food and Drug Administration in the US has now given the go-ahead for a trial to see if the same effects can be replicated in humans.”

“I have been doing research into aging for 25 years and the idea that we would be talking about a clinical trial in humans for an anti-aging drug would have been thought inconceivable...20 years ago aging was a biological mystery. Now we are starting to understand what is going on.”

“Scientists think the best candidate for an anti-aging drug is metformin, the world’s most widely used diabetes drug, which costs just 10p [15 cents] a day. Metformin increases the number of oxygen molecules released into a cell, which appears to boost robustness and longevity.”

“If we can slow aging in humans, even by just a little bit, it would be monumental. People could be older, and feel young.”

“This would be the most important medical intervention in the modern era, an ability to slow aging.”

Even the venerable Dr. Robert Temple, deputy director at the FDA, chimed in by stating:

“Their hope is that a wide variety of age-related problems, loss of muscle tone, dizziness, falls, dementia, loss of eyesight, all of those things [sic]. That would be something never done before. If you really are doing something to alter aging, the population of interest is everybody. It surely would be revolutionary if they can bring it off.”

Dr. Simon Melov of the Buck Institute for Research on Aging added:

“You’re talking about developing a therapy for a biological phenomenon which is universal and gives rise to all of these diseases. And if you’ve got a therapy for this thing, these diseases just go away.”
Life Extension® Has Championed Metformin for 20 Years

*Life Extension*® magazine listed metformin as one of many important offshore medications back in 1995. And now, 20 years later, even the FDA concurs that metformin has potential to delay the onset of degenerative diseases.

But contrary to news headlines, metformin will not enable humans to live to 120 years of age all by itself. What it may do is allow humans to age better today—thereby staving off degenerative diseases long enough for age-reversal breakthroughs to become clinically available.

Metformin's Primary Anti-Aging Mechanism

*Metformin* enhances the activity of an enzyme found within our cells called adenosine monophosphate-activated protein kinase—or AMPK for short. AMPK activation helps mimic the beneficial effects of calorie restriction, the best documented method of slowing and reversing biomarkers of human aging.

We at *Life Extension*® have long endorsed AMPK activation as a method of slowing biological aging. We advocate that our supporters utilize some proven method to increase their cellular AMPK activity, which could add substantial healthy years to the average life span.

How to Boost Your AMPK Today!

We do not want you to age prematurely, waiting years for the results of the new FDA-approved human study. That’s why we recommend you initiate steps now to boost healthy AMPK activity today.

One of the benefits of practicing consistent calorie restriction is a substantial increase in AMPK activity as cells go into a semi-starvation mode and increase their survival efficiency.

People under age 60 who regularly/vigorously exercise boost their AMPK levels. This may be the mechanism by which exercise markedly lowers cancer risk. As people age past 60, exercise may not adequately boost AMPK enzyme activity.

If you’re presently taking 1,000 to 2,550 mg of metformin daily, you don’t have to do anything, simply enjoy this drug’s anti-aging benefits. But if you cannot acquire a prescription for metformin, or cannot tolerate it due to digestive issues, there are nutrient formulas that have been shown to significantly boost AMPK activity.

On the next page is a reprint of one of many articles appearing around the world that report on the first clinical trial to see if a drug can slow aging and enable people to live longer.

While the headline of this (and many other articles) is exaggerated, the quotes from mainstream researchers accurately reflect what metformin might demonstrate in this first clinical study.

We at Life Extension® will stay abreast of this study to ascertain how close its design and implementation come to our long-standing recommendations on the use of this AMPK-activating medication.

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

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.
I have been doing research into ageing for 25 years and the idea that we would be talking about a clinical trial in humans for an anti-ageing drug would have been thought inconceivable.

But there is every reason to believe it’s possible. The future is taking the biology that we’ve now developed and applying it to humans. 20 years ago ageing was a biological mystery. Now we are starting to understand what is going on.

Ageing is not an inevitable part of life because all cells contain a DNA blueprint which could keep a body functioning correctly forever. Some marine creatures do not age at all. However over our lifetime billions of cell divisions must occur to keep our bodies functioning.
correctly and the more times cells divide the more errors creep into the process. As cell problems grow, the body can no longer repair damage. In the case of cancer, cells no longer have the ability to get rid of mutations, and tumours grow. In Alzheimer’s the brain stops working. Mice treated with the world’s most widely used diabetes drug which costs just 10p a day. Metformin increases the number of oxygen molecules released into a cell, which appears to boost robustness and longevity.

Scientists think the best candidate for an anti-ageing drug is metformin, the world’s most widely used diabetes drug which costs just 10p a day. Metformin increases the number of oxygen molecules released into a cell, which appears to boost robustness and longevity.

When Belgian researchers tested metformin on the tiny roundworm C. elegans the worms not only aged slower, but they also stayed healthier longer. They did not slow down or develop wrinkles. Mice treated with metformin increased their lifespan by nearly 40 per cent and their bones were also stronger. Last year Cardiff University found that when patients with diabetes were given the drug metformin they in fact lived longer than others without the condition, even though they should have died eight years earlier on average.

The new clinical trial called Targeting Aging with Metformin, or TAME, is scheduled to begin in the US next winter. Scientists from a range of institutions are currently raising funds and recruiting 3,000 70 to 80 year olds who have, or are risk of, cancer, heart disease and dementia. They are hoping to show that drug slows the ageing process and stops disease.

Outlining the new study on the National Geographic documentary Breakthrough: The Age of Ageing, Dr Jay Olshansky, of the University of Illinois Chicago, said: “If we can slow ageing in humans, even by just a little bit it would be monumental. People could be older, and feel young.

“Enough advancements in ageing science have been made to lead us to believe it’s plausible, it’s possible, it’s been done for other species and there is every reason to believe it could be done in us.

“This would be the most important medical intervention in the modern era, an ability to slow ageing.”

A baby girl born today is now expected to live to an average age of 82.8 years and a boy to 78.8 years, according to the Office for National Statistics. However if their trial performs as promised, experts say slowing ageing would be a public health revolution.

“We want to avoid that; what we’re trying to do is increase health span, not look for eternal life.”

Dr Robert Temple, deputy director of the FDA said: “Their hope is that a wide variety of age related problems, loss of muscle tone, dizziness, falls, dementia, loss of eyesight, all of those things.

“That would be something never done before. If you really are doing something to alter ageing the population of interest is everybody. It surely would be revolutionary if they can bring it off.”

Dr Simon Melov of the Buck Institute for Ageing Research added: “You’re talking about developing a therapy for a biological phenomenon which is universal and gives rise to all of these diseases. And if you’ve got a therapy for this thing, these diseases just go away.”

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Pancreatic Cancer Clinical Trial
Official Announcement of New Study

Life Extension® has entered into a clinical trial agreement with City of Hope to conduct a complementary medicine clinical study to evaluate the use of natural compounds and metformin along with a current standard in chemotherapy drugs in patients with metastatic pancreatic cancer.

While patients frequently take supplements during their cancer treatment, there are limited data available on both efficacy and tolerability. This study will combine a carefully selected number of natural compounds including curcumin and green tea extract (epigallocatechin-3-gallate) to be combined with metformin and standard first-line chemotherapy.

The median survival time for a metastatic pancreatic cancer patient treated with chemotherapy alone is only about 8.5 months, and five-year survival is approximately 1%. Pancreatic cancer is the fourth-leading cause of cancer deaths, with over 40,000 Americans expected to die this year from this disease. More effective treatments and new approaches are desperately needed for a highly complex disease such as pancreatic cancer, and testing a selected complex regimen of natural compounds and pharmaceuticals is one such new approach whose evaluation in a clinical trial is long overdue.

The clinical study conducted at City of Hope is expected to enroll 21 patients with metastatic pancreatic cancer. Primary objectives of the study include evaluating for compliance and toxicity, although survival will be evaluated in the hope of observing a meaningful improvement over the currently observed outcomes. The program is classified as an investigator-initiated study under the direction of Vincent Chung, MD, associate clinical professor, Department of Medical Oncology & Therapeutics Research with funding from Life Extension. For details of the clinical trial, log on to www.ClinicalTrials.gov. You can then enter on this Home Page under “Search for Studies” the identifier code: NCT02336087

About City of Hope
City of Hope is a leading research and treatment center for cancer, diabetes, and other life-threatening diseases. Designated as a comprehensive cancer center, the highest recognition bestowed by the National Cancer Institute, City of Hope is also a founding member of the National Comprehensive Cancer Network, with research and treatment protocols that advance care throughout the nation. City of Hope’s main hospital is located in Duarte, California, just northeast of Los Angeles. It is ranked as one of “America’s Best Hospitals” in cancer by U.S. News & World Report. Founded in 1913, City of Hope is a pioneer in the fields of bone marrow transplantation and genetics.

About Life Extension
Headquartered in Fort Lauderdale, Florida, Life Extension Foundation, established in 1977, is the world’s largest anti-aging medicine organization and currently funds laboratory and human studies aimed at improving long-term survival in difficult-to-treat cancers and other age-related disorders. The mission of Life Extension is to help humans live a healthier and longer life. Life Extension is dedicated to uncovering therapies and technologies that could lead to improved outcomes for the diseases of aging. Life Extension communicates with their client base with monthly issues of the Life Extension Magazine. For more information, visit www.lifeextensionfoundation.org or call 1-800-544-4440 or email info@lifeextension.com. Follow Life Extension on Facebook and Twitter.
AMPK
PROMOTES LONGEVITY FACTORS

Importance of AMPK
Studies show increased AMPK activity supports:

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

AMPK Activator provides nutrients shown to significantly boost AMPK activity.

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

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

References

To order AMPK Activator, call 1-800-544-4440 or visit www.LifeExtension.com

This supplement should be taken in conjunction with a healthy diet and regular exercise program.

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.
WHAT'S BEHIND THE HEALTH CARE CRISIS?
What’s Behind the HEALTH CARE CRISIS?

There was a time when medical insurance was an automatic benefit for most employees having a job in the public or private sector.

The majority of employees would be given employer-paid insurance not just for themselves, but for their families as well. During this era of American history (1950s-1980s), having comprehensive insurance typically meant that you were insured for virtually 100% of your medical needs.

Back in those days, the practice of forcing employees to pay significant portions of their health insurance premiums, requiring high deductibles, and exacting other “out-of-pocket” expenses was not common. The reason was that the cost of health care was not that expensive.1-3

Today, fewer than 50% of companies offer medical insurance for their employees.4 Most employees now pay for part or all of their costs to participate in a group insurance plan. Premiums have escalated to difficult-to-afford levels.

Medical insurance premiums have risen at a pace that is above the inflation rate and there is no indication that this trend will be changing in the near future.2

With medical premium prices skyrocketing, copay charges soaring, and deductibles reaching unaffordable levels, it’s no wonder Americans are fed up. For some plans, the insurance coverage is so meager that the plans function more like subsidies than comprehensive insurance.

Premiums for even bottom-of-the-barrel health insurance coverage are prohibitively expensive for middle income families. And when a serious illness develops, insurance companies often balk at paying for expensive drugs and diagnostics that represent valid medical needs.5,6

Although such practices leave many insured Americans in financial disarray, the situation is far worse for the 36 million Americans who live without health insurance, and a great many more who can only afford low-coverage insurance plans.7 The majority of these people’s livelihoods are put at stake every day in a great gamble, as they may be just one major medical issue away from financial insolvency.

But why are insurance companies subjecting Americans to what seems like extortionist prices and coverage denials?

The answer is simple, but often overlooked. Read on to find out why most medical insurance plans cannot come close to covering today’s inflated health care costs.
You would think a similar manner of price gouging would not exist in the generic drug industry. After all, the generic prescription drug industry was revolutionized in 1984 via the Drug Price Competition and Patent Term Restoration Act. As the name implies, generics were created for the purpose of introducing the fundamental concept of competition into the health care market with the effect of substantially lowering the cost of medicine for many Americans.

Unfortunately, certain generic drug manufacturers operate as quasi-monopolies that act in the antithesis of competition. An artificial scarcity of drug manufacturers is one of the causes that has led to skyrocketing prices for certain generics.

In 2011, a congressional investigation was opened seeking to find the source of the so-called prescription drug “shortages” that had seen 99.5% of hospitals around the US experience at least one shortage of a

**Insurance Prices Reflect the Price of Medicine**

Just as medical insurance now costs a fortune, the price of medical care does as well. Nowhere is this more apparent than the outlandish prices of prescription drugs.

Consumers and health insurance companies alike are subjected to markups that are beyond rational comprehension. Retail prices for prescription drug costs have risen so high that many “insured” individuals cannot afford their copays.

In fact, drug prices in the United States are rising so fast that total spending on prescriptions is expected to explode to $1.3 trillion by the year 2018, up from only $326 billion in 2013, an almost 4-fold increase in prescription drug spending.

It is commonplace for name-brand pharmaceutical giants to charge immense prices for the patented drugs they sell. Excuses given to justify these prices are the costs of the company’s research and development, as well as the expense and arduous time constraint involved in complying with FDA-imposed drug approval requirements.

The prices of patented brand-name drugs, however, have now gone far beyond the research and development costs and the realms of reasonable profit. The hepatitis C drug Sovaldi® is an egregious example. A bottle containing 84 pills costs $84,000. The cost to manufacture Sovaldi® is estimated to be around $130. The company making Sovaldi® will earn back all the development costs in less than two years, while hepatitis C victims are bankrupted paying this extortionist price for another 14 years or so.

**Competition Is the Single Greatest Market Force Capable of Lowering the Cost of Medicine**

As the chart below shows, increasing competition is a proven approach that works to keep generic drugs inexpensive. There is a distinct connection between the number of manufacturers producing a generic drug and what the price of that drug will be. When seeking strategies to bring down the price of any good or service, how to increase competition should be the first thought in mind.

**Source:** FDA analysis of retail sales data from IMS Health, IMS National Sales Perspective™, 1999-2004, extracted February 2005.
prescription drug within a six-month period. Some 44% of hospitals stated that they had encountered 21 or more shortages of prescription drugs during the same time period.25

A congressional investigation exposed some of the sordid facts behind these supposed prescription drug “shortages.” According to a detailed congressional report released on July 25, 2012, shortages of prescription drugs were intentionally created to artificially jack up prices for consumers through “gray market” tactics.26 The scarcity of medicine resulted in systemwide explosions in the prices of many drugs.27 The findings of this investigation exposed a despicable method in which pharmaceutical companies defraud the American people.28

For example, the drug cytarabine could be bought via its manufacturer through contract for about $12 a vial on average. By the time the drug was run through an elaborate network comprised of crony wholesalers, “shortages” mysteriously developed. The average price of cytarabine then shot up to over $990 per vial.29

This trend of exorbitant price increases occurring in response to artificial “shortages” has intensified in recent years, causing some insurance companies to question the need for virtually every drug your physician may prescribe.

**Generic Makers Get Away with Collusive Practices**

An example of violations of antitrust laws was brought to light in 2015 in response to a lawsuit the Federal Trade Commission had filed alleging such behavior regarding sales of the drug Provigil®.

In a 1.2 billion dollar settlement, Teva Pharmaceuticals admitted that Cephalon, a pharmaceutical company later absorbed into the Teva conglomerate, paid several generic drug manufacturers to delay the introduction of their generic equivalents so that they would not compete with the higher-priced drug (Provigil®) even after its patent had expired.30,33

The Sherman Antitrust Act makes it illegal for businesses to intentionally collude to raise prices. The Sherman Act calls for penalties that usually go far beyond mere fines. Case law demonstrates that the criminal prosecution of everyone involved in making collusive actions is typical.34,35 Not all are convicted, but criminal investigation commonly follows the uncovering of these behaviors.36

It may not surprise you that there hasn’t been, and likely never will be, a criminal investigation against the executives of Teva who, according to their civil settlement, admitted collusive behavior. Despite an immense fine, the company is walking away in the green.

**The High Cost of Health Care**

- Today, fewer than 50% of companies offer medical insurance to their employees and most employees must pay for part or all of their costs to participate in a group insurance plan. Meanwhile, premiums have risen to an outlandish level.

- The situation is even worse for the 36 million Americans who live without any health insurance or those who can only afford low-coverage plans.

- Drug prices, both brand name and generic, are soaring. By the year 2018, total spending on prescription drug prices will cost $1.3 trillion, up 4-fold from $326 billion in 2013. And despite the Drug Price Competition and Patent Term Restoration Act of 1984, the cost of many generic drugs also continues to skyrocket.

- For example, doxycycline hyclate, a generic prescription antibiotic, costs about $20 for a bottle of 500 tablets. By 2014, the price for the same quantity of the same drug rose to $1,849—a price increase of over 8,200%.

- Congressional investigations into price gouging by Big Pharma have gone nowhere.

- If the generic drug market is to avoid the current stranglehold, a free-market environment must be implemented. This would allow the price of most generic drugs to fall and Americans could once afford the medicines they need.
But just how far in the green is Teva? According to an article in *Forbes*, in the first quarter after Cephalon was absorbed into Teva, “Provigil® generated $350 million in sales.” That’s $350 million dollars over just a three-month period.

Now, according to Teva’s filings with the Securities and Exchange Commission, Cephalon/Teva Pharmaceuticals effectively stalled the introduction of a generic counterpart of Provigil for several years. Even assuming $350 million in three months was a peak for Provigil sales, due to the sheer enormity of the price fixing, it’s still a fairly safe bet that Teva is walking out with both pockets full and then some by paying a $1.2 billion fine on sales of a drug that generated many more billions in profits.

The profits Teva managed to bank came from the pockets of the American consumer and of taxpayer-funded programs like Medicare. This is not an isolated case, but more of a business-as-usual practice in the pharmaceutical industry as can be seen on the chart below.

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### Outlandish Generic Drug Price Spikes

The chart below shows the magnitude of generic price increases over a six-month period:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Use</th>
<th>Average Market Price October 2013</th>
<th>Average Market Price April 2014</th>
<th>Percentage Price Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol Sulfate (bottle of 100, 2 mg tablets)</td>
<td>Used for asthma and lung conditions</td>
<td>$11</td>
<td>$434</td>
<td>4,014%</td>
</tr>
<tr>
<td>Glycopyrrolate (box of 10 0.2 mg/mL, 20 mL vials)</td>
<td>Used during surgery to prevent irregular heartbeats</td>
<td>$65</td>
<td>$1,277</td>
<td>2,728%</td>
</tr>
<tr>
<td>Divalproex Sodium ER (bottle of 80, 500 mg tablets ER 24H)</td>
<td>Used to treat seizures and prevent migraines</td>
<td>$31</td>
<td>$234</td>
<td>736%</td>
</tr>
<tr>
<td>Pravastatin Sodium (bottle of 500, 10 mg tablets)</td>
<td>Used to prevent heart disease and treat high cholesterol</td>
<td>$27</td>
<td>$196</td>
<td>573%</td>
</tr>
<tr>
<td>Benazepril/Hydrochlorothiazide (bottle of 100, 20-25 mg tablets)</td>
<td>Used to treat hypertension</td>
<td>$34</td>
<td>$149</td>
<td>420%</td>
</tr>
</tbody>
</table>

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Here is an excerpt from a Senate investigation about these generic drug price spikes:

“According to Medicare and Medicaid data, between July 2013 and July 2014, half of all generic drugs went up in price. During this same time period, over 1,200 generic drugs, nearly 10% of all generic drugs, more than doubled in price. In fact, these drugs went up in price by an average of 448%; dozens of drugs went up by 500%, 600%, 1,000%. So to say that we’re just looking at 10 drugs is not accurate; there appears now to be a trend in the industry where a number of drugs are going up at extraordinary rates.”
Skyrocketing Prices Sparks Senate Investigation

After years of rising generic drug prices, the high cost of health care again caught the attention of lawmakers in Congress. In an attempt to seek out the underlying cause of the exponential increases, a joint committee hearing was held to investigate the source of the price hikes.38-40

A Senate investigation commenced with a request to 14 different generic drug manufacturers for specific information regarding the drugs they sell.40 This information requested included: total gross revenues, dates, quantities, purchasers, prices paid for all drugs, contracts, prices of identical drugs in foreign markets, and the identity of company officials responsible for increasing the drug prices.

Not surprisingly, none of the 14 generic drug manufacturers elected to testify before the hearing or provided the data the committee had requested.38,41 It was pointed out that at least two of the manufacturers that Congress had requested data from were under current investigation by the Department of Justice under allegations of antitrust law violations.42,43

The data the Senate committee was able to acquire from consumer advocacy and group purchasing organizations was compelling. These consumer organizations measured and tracked the price increases of various generic drugs.

The final report was presented in front of the Senate Subcommittee on Health. It showed that many of the drugs they tracked had unexplainable and astronomical rises in price in a time frame that spanned well under a year.44,45

One, for instance, is doxycycline hyclate, a generic prescription antibiotic used to treat many types of infections. This drug had an average market price in 2013 that hovered at about $20 for a bottle of 500, 100 mg tablets.44 This would be about double the price of a large over-the-counter bottle of aspirin.

By 2014, the price for the same quantity of the same drug had risen to $1,849. The magnitude of this represented a price increase of over 8,200%.

No other industry can increase the price of a non-patented product by 8,200%. Take for example, the typical bottle of aspirin that was alluded to previously. If the market for aspirin were given the same barriers to entry and regulatory restrictions that the FDA puts on the common antibiotic doxycycline, would consumers just sit idly by as their cost jumped to a proportional $828 for a bottle of aspirin tablets?

More Price Gouging

Albuterol was also cited by the Senate committee as having a price increase of over 4,000%.38,45

Albuterol is a generic drug prescribed by doctors to treat patients with conditions such as asthma, bronchitis, or similar breathing problems.46 Albuterol was sold at an average market price of $11 for a bottle of 100, 2 mg tablets, in October 2013. After recent unexplained price increases by various pharmaceutical companies, the average price for albuterol sulfate jumped to $434 by April 2014.

Albuterol is frequently one of the top 10 best-selling drugs. In the year 2013, 63.6 million prescriptions were written exclusively for patients who needed the drug.47
At the average market price for albuterol in October 2013, the drug would have cost Americans $699.6 million to acquire over the fiscal year 2013. When the new extortionist price is multiplied by the same number of scripts that were written in 2013, the albuterol that once cost Americans $699.6 million per year now costs $27.6 billion. This represents a net change of 26.9 billion dollars more per year for the same generic drug that our health care system must now bear.

Apply that same math to pravastatin, a popular generic drug used to lower cholesterol, which saw a price increase of 573% from October of 2013 to April of 2014 with the cost to the American health care system being an additional $5.9 billion dollars per year.

During the investigation, the ranking committee member pointed out just what kind of an effect this egregious price gouging is having on the individual American:

“According to the most recent reports, more than one in four Americans do not fill their prescriptions because they cannot afford the cost. Think about that for a second; people walk into their doctor’s office because they are sick. They or their insurance company pays for that visit. Their doctor spends time with them. Their doctor diagnoses the illness. The doctor writes out a prescription, and one out of four people is unable to afford to fill that prescription. What happens to those people? They go home, their illness continues, and maybe they end up in the hospital. Totally absurd situation.”

Prices on medical care as a whole have skyrocketed over the past few decades and the numbers leave no room for ambiguity. According to a Harvard study, 62.1% of all bankruptcies in the United States emanate from individuals who bear insurmountable medical-related debts.

The problem with this legislation is that it made no attempt to alleviate the burden of high generic drug prices on consumers. Instead it would force pharmaceutical companies, which billed Medicaid at prices that rose faster than the inflation rate, to pay a rebate of some kind. Like putting a bandage on a mortal wound if enacted into law, such modest provisions would hardly put a damper on the rising cost of medicine in America. Despite being an ineffective attempt at curbing high drug prices, it would at least be a step in the right direction, and if passed it might slow the rate at which pharmaceutical companies are bankrupting programs like Medicare and Medicaid. Yet this drop-in-the-bucket solution never made it out of committee, and it subsequently died in Congress.

After decades of rising generic drug prices, and with no feasible end in sight, many Americans have been left asking, who is to blame and what lies behind the curtains? This would lead many to think, “Why hasn’t Congress done anything about this?”

The answer is that the United States Congress is so heavily lobbied by the pharmaceutical industry that it has been effectively incapacitated from enacting any legislation that would in any way hinder the profit margins of Big Pharma.

The effects of this price gouging are devastating for Americans who rely on certain drugs every day just to survive.

In response to news reports of these prices spikes, Congress launched investigations and spawned legislation with the intent of combatting spiraling health care costs.

The Senate committee looking into high-priced generic drugs concluded with an announcement that legislation—later named The Medicaid Generic Drug Price Fairness Act of 2014 (S. 2948; H.R. 5748)—would be brought before Congress in an effort to mend the cost crisis.

The pharmaceutical industry learned long ago that spending money lobbying lawmakers to pass favorable legislation is a lot more profitable than being more competitive or innovative.

This pervasive system of institutionalized corruption is a regular practice on Capitol Hill, where lobbying seldom benefits the American consumer.

Pharmaceutical companies spend hundreds of millions each year to shape and influence politics, putting profit margins as a priority above everything else.
In 2003, the Medicare Modernization Act passed the House by a margin of just one vote.\textsuperscript{56} It was pushed through Congress with great vigor from pharmaceutical lobbyists.\textsuperscript{57} The bill expanded federal spending in the healthcare industry while simultaneously eliminating the government’s power to negotiate prices for the prescription drugs it purchases.\textsuperscript{58} A study on the effects of the Medicare Part D provision of the Medicare Modernization Act precisely cited the real-world benefits pharmaceutical companies received from lobbying for the bill’s passage.

“In Because of the passage of Medicare Part D, pharmaceutical companies generated millions of new customers who previously lacked prescription drug coverage. Moreover, the pharmaceutical industry defeated the reform measures they feared most: legalized importation of lower-cost medicines, governmental price controls, and easier market access for less expensive generic drugs.”\textsuperscript{57}

Big Pharma’s ultimate objective in lobbying is the engineering of legislation and regulation that both opens up the floodgates of federal spending on pharmaceuticals and limits competition in the drug market.\textsuperscript{57,59}

In the year \textbf{2014}, drug companies spent approximately $230 million lobbying the government in one way or another.\textsuperscript{60}

Since 1999, no other industry has spent more money lobbying the government for the promotion of special interest than the pharmaceutical industry.\textsuperscript{61} A study on the profitability of lobbying administered by \textbf{Strategas Research Partners} revealed that for every 1 dollar a business spends lobbying the federal government, that business makes 220 more dollars as a result of influencing public policy in their favor.\textsuperscript{55}

The objectives and the means in which Big Pharma achieves its objectives are not tied to any set of political ideals. Big Pharma seeks to buy the influence of every member of Congress in the form of campaign, PAC, and Super PAC contributions, as well as promises of lucrative executive positions and lobbying jobs after their retirement from office.\textsuperscript{62-64}

One might think that there would be some members of Congress whose ideals, virtues, and moral standards would enable them to refuse such blatant bribery. What most of the public does not realize is that Big Pharma, like other special interests, not only offers elected officials incentive for selling out their constituents, but these elected officials are also subjected to implicit

\textbf{WHAT’S BEHIND THE HEALTH CARE CRISIS?}

\begin{center}
\textbf{The Cost of Winning Congressional Elections}
\end{center}

Here is the average cost of winning elections in the House and Senate since 1986 in 2012 dollars.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{cost_of_winning_elections.png}
\end{figure}

According to the Campaign Finance Institute the amount of money spent directly by an incumbent member of Congress to win congressional elections has risen 344\% from an inflation-adjusted $360,000 in 1986 to a whopping $1.6 million in 2012.\textsuperscript{67,68} This is vindicated by a research report from Cornell Law, which now proves that on average, 30\% to 70\% of a sitting member’s time is spent raising campaign funds instead of tending to constituents, official duties, or legislative affairs.\textsuperscript{69,70}

Jon Corzine spent $63,209,506 to win the US Senate seat in New Jersey. Hillary Clinton spent $29,941,194 on her Senate win in New York. The remaining Senate winners spent an average of $4,737,365.

Inflation adjustment based on average 2012 Consumer Price Index. Source: Campaign Finance Institute
Lobbying the FDA

Agencies like the Food and Drug Administration (FDA) are heavily lobbied by pharmaceutical companies, and this is a major source of the high drug cost problem, as it is the FDA that determines which generic and brand-name drugs obtain “approval.” This plays into the hands of the pharmaceutical industry and creates monopolistic practices that devastate the pocketbooks of American consumers.

Beyond just exorbitant drug prices, the FDA has a drawn-out drug approval process that spans many years. In 2012, Congress sought to address the FDA’s unconscionable delays that were keeping generic drugs from being able to compete and reduce the costs of medicine for Americans.

In an attempt to alleviate the delays, the Food and Drug Administration Safety and Innovation Act was passed. The bill extended the provision of “user-fee agreements” from brand-name drugs to generics as well. The concept of “user fees” was implemented to create an incentive for the FDA to approve the sale of generics on at least an acceptable timescale.

Businesses now seeking the FDA’s approval to sell generics have to pay to ensure that the agency does its job reasonably. Although the FDA is fully staffed and is tasked with approving generic medications already, a handsome payment to the FDA in the form of a “user fee” is still required to get one’s drug approved expeditiously. Pharmaceutical companies cherish this “user-fee” system because it locks smaller competitors out of the regulatory labyrinth. Established companies gain the most as they can afford to expend all kinds of “user fees” to ensure their drug(s) get priority approval over the competition.

Despite pharmaceutical companies paying high user fees, they do not always get the timely service they think they paid for. During a Senate committee hearing, one senator revealed the true extent of failure this program has had on the ability of generic drugs to be approved by the FDA:

“Since 2012, the Food and Drug Administration has been implementing the first generic drug user-fee agreement. Since this agreement was intended to accelerate the delivery of high-quality, low-cost generic drugs, we have to ask ourselves, ‘is it working?’ and ‘has it accomplished that goal?’ In 2011, the median time for generic approvals was about 31 months. Two years and hundreds of millions of dollars later in generic user fees, it’s taking longer for generic drugs to be approved by the FDA, 36 months and counting... Thousands of generic drug products await review by the agency. In fact, there are more generic drug applications waiting review at the FDA today then before the generic drug user-fee agreement was put in place.”

Coercion if they refuse to cooperate with pharmaceutical financial interests in certain circumstances.

Coercion against elected officials typically manifests as the prospect of campaign, PAC, and Super PAC contributions given not to the member of Congress who chose not to succumb to the whims of special interest, but to his or her opponent in the next election cycle. This system has worked to simultaneously purge the honest and the honorable from power while normalizing crooked and unethical practices in Washington.

The methods in which these tactics are employed, the intentions behind them, and the end goals mirror outright bribery and intimidation, yet they are instead acknowledged, justified, encouraged, and perpetuated under a very thin veil of free speech.

The pharmaceutical lobby’s eyes are not so narrow as to only focus on Congress as a means of acquiring favorable policy and maintaining their anticompetitive edge.

Big Pharma is quick to exploit the “Revolving Door,” or the movement of personnel between lawmaking positions, regulatory positions, and the private industries affected by these regulations. Of the registered lobbyists Big Pharma utilized to buy power and influence in and amongst government lawmakers and regulators in 2014, 880 out of 1,421 have been identified as revolvers, meaning 880 had previous government jobs in relevant agencies or positions before working for pharmaceutical companies or vice-versa.

As a result of the gargantuan sum of money Big Pharma pours into Washington, registered pharmaceutical lobbyists now outnumber US congressman nearly 3 to 1. This influence has allowed private enterprise to gain tight control over public policy.

WHAT’S BEHIND THE HEALTH CARE CRISIS?
The implications of policies like this are ominous. Such overbearing requirements for generic drug approval make it increasingly difficult for new companies to bring competition into markets. As the drug approval lag widens, and competition is diminished, prices will rise to intolerable levels.

This has created a deadly wait for many Americans who live with life-threatening illnesses and need reliable access to inexpensive medicine because for many, this is a matter of life and death.

**Real-World Solutions to High Drug Prices**

As long as the regulations and restrictions imposed by the FDA and Congress on the generic drug market continue to exist, these trends of shortages and price abuses will continue and worsen.

If the generic drug market were to be liberated from its current regulatory stranglehold, prices of just about every generic drug would fall and countless Americans would be able to afford all the medicine they need.

The regulations that are the most responsible for these abuses are the provisions that force generic drug manufacturers to gain approval from the FDA in order to begin selling a drug. This is the first of many muddled and self-defeating regulations that should be overturned.

While there are some generics that may require regulatory oversight to ensure bio-equivalency (such as drugs that require recombinant DNA technology), most could readily achieve measurably identical safety/efficacy as the name brand. Companies seeking to prove the equivalence or superiority of their product could obtain certification of safety and potency from private organizations akin to Underwriters Laboratories, which among other safety missions, is tasked with ensuring that consumers aren’t electrocuted when plugging electronic devices into outlets.

In any other market, after a patent expires on a product, anyone is allowed to manufacture and sell that product. At this point, the supply increases and the price drops.

Under the guise of protecting consumers, pharmaceutical drug lobbyists attempt to make the case that without stringent regulation, generics won’t be safe, potent, and effective. These intimidating claims don’t hold up to scrutiny.

Assuming a free-market environment opens up in the generic industry, what would be the incentive to sell defective products? The cost of the active (drug) ingredient is usually so low that it would be against the interests of a business to shortchange consumers or make defective products that would quickly be found ineffective in the clinical arena.

Existing laws already subjects those who sell dangerous or fraudulent products to criminal prosecution and civil lawsuits. These legal deterrents keep most consumer products generally safe to use.
Similarly, if a generic drug didn’t contain the potency listed on its label, that’s already a felony called fraud, which can result in severe legal repercussions. And, just like in every other industry, a company which would sell a lousy generic that isn’t effective would lose its reputation and likely be driven out of business.

By way of example, let’s assume a free market opens up in the generic drug industry. This would let Walgreens, for example, make their version of generic Pravachol® (pravastatin), a cholesterol-lowering drug. Since the active ingredient in pravastatin is so inexpensive, a month’s supply could be profitably sold to consumers for under $5. A follow-up blood test would quickly show whether this free-market pravastatin is adequately lowering total cholesterol and LDL.

The FDA’s regulation of the generic drug industry is at best redundant, but the truth is, it is deadly.

The FDA’s oversight of generic drugs was intended to be done for the public good, to save lives. However, current FDA regulation of generic drugs hinders the welfare of the American people and is costing lives because too many Americans cannot afford the spiraling cost of the generic medications they need.

Earlier in the article it was cited that one in four Americans do not fill their prescriptions because they cannot afford the cost. Too many Americans die from preventable, treatable illnesses as a result of the FDA’s regulatory authority that keeps prices too high while making many vital drugs sporadically unavailable to the public.

Summary

It’s easy to blame medical insurance companies for the suffocating costs that consumers now bear for their health care. Overlooked are spiraling medical costs that force insurance companies to raise premiums while cutting back on the portion of your sick care they will pay.

Big Pharma has effectively utilized its corrupting influence in Washington to usurp the wills and interests of the citizenry. Through this, it has effectively seized the power of the United States government through the manipulation of law and the crooked exploitation of regulation to plunder the welfare of the American people.

The endless flow of pharmaceutical money into the US political system enables the perversity of generic drug price gouging.

The FDA was created to foster and protect the health and welfare of the American people.

Not only does the FDA fail to serve this purpose, but it is destructive of it. Congress is tasked with keeping the FDA accountable to the people, while reining in on FDA abuse, overreach, and wrongdoing. Unfortunately, Congress and the FDA are no longer accountable to the citizens, nor even to common sense, but instead to the highest bidder.

The current system denies Americans dependable access to affordable medicine while stalling the acceleration of medical progress. Medications are purposefully made scarce and boast prices that are unattainable for many.
Our health, our wealth, and our very lives are being put at stake. The corrupt practices described in this article will persist and expand, until the anguished cries of every American grow loud enough that the apathetic are besieged into action and corrupting influences muffled into silence.

This is not a partisan issue. It adversely affects us all. The public should be rising up in outrage.

For life, rationality, and prosperity, Chase Falcon

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

Legislation Urgently Needed!

Life Extension® is organizing a grassroots campaign to overwhelm the lobbyists that currently dominate Congress and federal agencies that are adversely impacting our health and longevity. A website has been set up for those who want to enlist as activists to combat the atrocities perpetrated against the citizenry by our politicians and unelected/unaccountable bureaucrats.

To enroll in this campaign to tear down high drug prices, log on to: LifeExtension.com/consumer

References

Most of a coffee bean’s polyphenol content is destroyed during the roasting process. Among the most beneficial of these polyphenols is chlorogenic acid, a potent inhibitor of the glucose-6-phosphatase enzyme that stimulates excess gluconeogenesis.

A Patented Organic Roast
Life Extension’s Rich Rewards® Breakfast Blend and Decaffeinated Roast are made using a patented, 100% natural process called HealthyRoast®. Rich Rewards® consists of 100% USDA certified organic arabica coffee beans.

Savory Taste Without Stomach Upset
The HealthyRoast® process also preserves special, naturally occurring compounds in coffee that soothe your stomach.

Tasty Decaf
With Rich Rewards® Decaffeinated Roast, you can limit your caffeine intake without compromising on flavor. The caffeine is removed through a chemical-free water process. It delivers the full flavor, aroma, and body of the arabica bean. Rich Rewards® Breakfast Blend contains up to 87% more chlorogenic acid than conventional caffeinated coffees. Rich Rewards® Decaffeinated Roast contains up to 187% more chlorogenic acid than conventional decaffeinated coffees.

Comparison of Conventional Coffee to Life Extension’s Rich Rewards® Blend

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* US Patent 6,723,368.
The quickest way to betray age is through tired, unhealthy hair, skin, and nails.

Working from the inside out, orally ingested nutrients are demonstrating clearly visible outward benefits. Clinical studies reveal these nutrients promote the structural proteins of collagen and keratin that keep hair, skin, and nails looking vibrant.

Here are the nutrients contained in a novel rejuvenation formula:

- **Cynatine® HNS Plus**: This ingredient combination provides solubilized keratin, zinc, vitamins B3, B5, and B6, copper, and biotin—the raw materials needed for keratin formation for strong hair, skin, and nails. Clinical studies using Cynatine® showed an impressive 11.5% reduction in the appearance of wrinkles and a marked improvement of almost 50% in hair brightness and luster.12

- **VERISOL® Bioactive Collagen Peptides®**: This patented bioavailable composition of Bioactive Collagen Peptides® supports the skin extracellular matrix by stimulating the formation of new collagen and elastin to promote the suppleness and elasticity of aging skin.1 Clinical studies on women demonstrated an average 20% reduction in eye wrinkle volume after just eight weeks, an 18% increase in elastin,1 and a 7% increase in skin elasticity—affect even more pronounced in women over 50.4

- **Biotin**: Biotin is an essential co-factor in the synthesis of fat and protein molecules that are prominent in skin, hair, and nails.5 Studies demonstrate that biotin supplementation supports strength, hardness, and integrity of the nail.5

- **Silicon**: Silicon is required for the formation of the protein cross-links that hold collagen and keratin molecules in their unique, functional shapes.7

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**Hair, Skin & Nails Rejuvenation Formula with VERISOL®**

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1 bottle  $32
4 bottles $22 each

To order Hair, Skin & Nails Rejuvenation Formula with VERISOL®, call 1-800-544-4440 or visit www.LifeExtension.com

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

is uniquely derived from grass-fed, free-range cows living healthy lives in New Zealand and not treated with growth hormone (rBST). Its naturally high content of branched-chain amino acids (BCAAs), lactoferrin, and immunoglobulins is ideal for those who wish to:

- Help maintain lean muscle mass,
- Support healthy immune function, and
- Protect against free radical attack.

Available in both natural chocolate and natural vanilla flavors.

References


To order New Zealand Whey Protein Concentrate, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Fungal infections can cause a troublesome array of health problems ranging from daily lethargy and sinusitis to life-threatening infections. However, the role of fungal infections in sinusitis is underestimated.

A study from the Mayo Clinic showed positive fungal cultures in those with chronic sinusitis.¹ Subjects in a separate study using a patented natural antimicrobial intranasal solution found substantial relief from sinusitis.²

People who suffer from chronic sinus problems may find a renewed sense of vitality once their sinus problems are cleared through the use of this nontoxic antimicrobial solution.
Sinusitis: More than a Minor Annoyance

Chronic sinusitis is one of the more commonly reported reasons for patient visits to a family physician. Each year, about 31 million Americans report having sinusitis, involving 73 million restricted activity days per year at a cost of $5.8 billion in medical expenses. Common treatments for sinusitis involve antibiotics, steroid nasal sprays, prescription antihistamines, and eventually 200,000 sinus surgeries per year at a cost of $800 million.2,9,10

Masters of Evasion

Fungi are the top and the bottom of the food chain. They make potent medicines (think antibiotics) and perilous poisons. Through their bewildering array of digestive enzymes, they can decompose any life form back to the earth. Without fungi, the earth would be shoulder deep in dead matter that did not decay. Fungi, mushrooms, yeast, and mold are all part of the kingdom Fungi or Mycota. While there are about 300 different horse breeds on earth and 2,600 different species of palm trees, there are up to 5 million species of fungi with almost 300 of those species causing diseases in humans.11,12

Function of the Sinuses

We take in air usually through the nose, somewhere around 11,000 liters per day (equaling 388 cubic feet). This air needs to be filtered and warmed by the four pairs of sinus cavities (frontal, ethmoid, sphenoid, and maxillary). In the presence of sinusitis, there is a need to address the underlying problem by cleansing the sinus cavities with safe antimicrobial agents that work in synergism.

Method to Lower Mold Load in the Sinuses

In response to this pervasive problem, researchers developed a patented nasal solution. Clinical tests showed favorable action in people suffering from chronic sinusitis. This nasal solution was clinically tested under the guidance of an institutional review board (IRB) at the world famous Riordan Clinic in Wichita, Kansas. Forty patients with chronic sinusitis were recruited for this study, which compared saline (salt water) solution, the preferred method of cleansing the sinuses for many ear, nose, and throat (ENT) doctors, to the antimicrobial sinus solution. In only four weeks, the antimicrobial nasal solution improved symptoms by 27%.2

Cause of Many Illnesses

Many smart people in the global health care community argue that fungal infections are drastically underdiagnosed.

Orian Truss, MD, in his seminal work The Missing Diagnosis, argued that fungal infections may be at the root of many refractory ailments like stress, fatigue, depression, pain, and especially autoimmune conditions.

A.V. Costantini, MD, former director of the World Health Organization Mycotoxin Collaborating Center at the University of Freiburg, Germany, has written a series of books on fungal bionics claiming that many degenerative diseases of mankind are caused by fungal mycotoxins in the body (from the fungus organism) or fungal mycotoxins in our food supply through moldy grains and other contamination.3

While certain individuals are at a higher risk for fungal infections,4,5 some researchers discuss the connection between mycotoxins and their role in cancer. Many byproducts of fungi, or mycotoxins, can cause cancer.6 Aflatoxins, a byproduct found in moldy grains and other foods, is one of the most carcinogenic substances ever studied.7 Fungi can produce biofilms, which are best compared to a “bulletproof shield” against drugs because the biofilm makes the fungi resistant to the strongest antifungal drugs in use.8 With the explosion in research on the human microbiota (trillions of cells in the gut that dramatically affect health), scientists are finding that fungi probably play a role in many human health problems including sinusitis.
Natural Components of Antimicrobial Nasal Irrigator

The antimicrobial nasal solution consists of four primary ingredients blended in homeopathic dosages and technique: *Baptisia tinctoria* (wild indigo), grapefruit seed extract, oregano, and nano silver, in a pH balanced isotonic blend.

This enriched nasal solution is intended to be used only once daily.

Video Link for Best Results

Since the proper use of this enriched nasal solution is critical for obtaining best results, there is a medical animation at www.lifeextension.com/sinus to demonstrate this simple technique of cleansing the front and the back of the sinus regions.

This video should be reviewed before one purchases this novel sinus solution.

Simple Solution for Many Complex Health Problems

People with sinusitis, apnea (stop breathing while sleeping), halitosis (bad breath), wheezing, seasonal allergies, who snore, who work around mold (like animal dung) or sawdust (which irritates the sinuses), or who fly on commercial airlines (where you share the air with 200 people, some of whom are not well) should consider using this enriched nasal solution as a means to cleanse the sinuses, lower fungal load, and raise overall wellness level.
Summary

People with sinus infections, as well as those with sleep apnea, who fly often, work around irritants, or suffer seasonal allergies often have a variety of health issues, from lethargy to life-threatening infections. Many sufferers test positive for fungal cultures.

While many over-the-counter solutions have a shelf life of two years maximum due to the growth of fungi in a liquid medium, this enriched sinus solution has proven to provide a five-year shelf life via stabilization studies conducted by an FDA-approved laboratory. All of the ingredients in this sinus solution work synergistically to retard the growth of fungi as proven by its extraordinary shelf life.

Those with sinus issues should consider cleansing the sinus cavities with antimicrobial agents. A pH-balanced isotonic blend solution of *Baptisia tinctoria*, grapefruit seed extract, oregano, and nano silver was shown to improve sinusitis symptoms by 27%.

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

References


Patrick Quillin earned bachelor’s, master’s, and doctoral degrees in nutrition. He is a registered dietitian (RD) and certified nutrition specialist (CNS). His 17 health books, including the international bestseller *Beating Cancer with Nutrition*, have sold over 2 million total copies. He taught college nutrition for eight years, worked with both the La Costa Spa and Scripps Clinic, was vice president of nutrition for Cancer Treatment Centers of America for 10 years, and was a grant reviewer for the National Institutes of Health Office of Alternative Medicine and the US Army Breast Cancer Project. He has been interviewed over 200 times on radio, 40 times on TV, and has been a keynote speaker at many professional conferences. He holds two patents and is currently CEO of the publishing company Nutrition Times Press, Inc.
Life Extension® first introduced **SAMe** in 1997. Since then, researchers around the world have continued to discover impressive benefits of this amino acid. While SAMe is largely known for its effects on optimal mood and brain support, it has also shown benefits for the liver and joints.

A study by Harvard Medical School and Massachusetts General Hospital cited the impressive benefits of SAMe for mood elevation. A report published in Germany showed that SAMe may help maintain healthy neurological function. This impressive report found that SAMe:

- **Increased** glutathione levels by **50%** and glutathione enzyme activity by **115%**,
- **Decreased** a measurement of free radical activity by **46%**, and
- **Inhibited** lipid peroxidation by **55%** in culture.

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

**References**

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**SAMe 400 mg**
Item #01933 • 30 enteric coated tablets

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(SAMe is also available in boxes containing 30 200 mg tablets. Retail price is $25. If you buy four, the price is reduced to $16.50 per box. Item #01935).

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

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

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.*
Millions of Americans suffer stomach discomfort caused by erosion of the protective mucosal lining. CarnoSoothe with PicroProtect™ provides numerous nutrient compounds shown to maintain a healthy gastric lining.

A recommended daily dose of two CarnoSoothe with PicroProtect™ vegetarian capsules supplies:

- **100 mg** of standardized PicroProtect™ Picrorhiza kurroa, a traditional plant extract from the Himalayan Mountains that helps circumvent the underlying causes of gastric lining damage and supports a healthy stomach wall.¹

- **50 mg** of zinc L-carnosine, a chelated compound of zinc and carnosine that works synergistically to support delicate stomach tissue.² In human trials, 70% of patients using chelated zinc-carnosine reported relief of stomach discomfort and 65% showed visible evidence of rejuvenation in gastro-intestinal imaging tests.³

- **500 mg** of standardized deglycyrrhizinated licorice extract, which inhibits pro-inflammatory molecules, stimulates the formation of prostaglandins that support healthy stomach tissue, and contains flavonoid compounds.⁴⁻⁷

- **750 mg** of a proprietary fruit blend, a blend of cranberry, blueberry, and grape seed extracts rich in proanthocyanidins.⁸⁻⁹

**Caution:**
Licorice should not be taken by women who have had breast cancer.

NutriCran® is a registered trademark of Naturex.

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**CarnoSoothe with PicroProtect™**
Item #01258 • 60 vegetarian capsules

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**References**
EASE SINUS SYMPTOMS

with

All-Natural, Drug-Free Sinus Cleanser™

Sinus Cleanser™ is a patented, non-medicated saline solution that contains homeopathic doses of

- Wild Indigo
- Oregano
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Sinus Cleanser™ supports natural defenses and washes away dust, debris, pollen, microbes, and other irritants to keep sinus cavities clear and healthy.

In a clinical study, users reduced painful sinus symptoms by 27%—even weeks after treatment ended!*


Review Video Link Before Purchasing
To enable you to understand how the Sinus Cleanser™ is to be used, please review the medical animation at:
www.LifeExtension.com/sinus

Sinus Cleanser™
Item #01249 • 4 fl. oz.

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To order Sinus Cleanser™,
call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Few nutritional sources have gained as much scientific validation as pomegranate.¹

THE NEXT-GENERATION POMEGRANATE FORMULA

Pomegranate Complete combines standardized extracts from the whole fruit and flower, along with pomegranate seed oil, to support system-wide health. In addition to the highly absorbable power-houses found in pomegranate fruit,²⁻⁴ Pomegranate Complete augments these polyphenols with newly discovered biologically active compounds from other parts of the pomegranate plant.

These little-known nutrients include: punicalic acid that provides cellular support to help with inflammation,⁵ and pomegranatate, to combat age-related metabolic changes.⁶

This superior formula supplies the complete nutritional profile of the pomegranate plant. Just one soft-gel of Pomegranate Complete provides polyphenols equivalent to 12.3 ounces of pomegranate juice concentrate (or 30 pomegranates) plus a proprietary blend of seed oil and flower extract.

Non-GMO

POMELLA® extract is covered under U.S. Patent 7,638,640 and POMELLA® is a registered trademark of Verdure Science, Inc.
MS: The underlying cause of gout is hyperuricemia, the buildup of excess uric acid in the blood. Uric acid is produced during the metabolism of purines, which are compounds found in high amounts in certain foods and beverages such as meats, poultry, seafood, and beer.

There are two ways to get purines, one is from the diet and the other is from making it in the body. Purines are important for the synthesis of nucleic acids, the building blocks of DNA. However, your body doesn’t need dietary purines, it can produce them on its own. So just about all dietary purines are converted to uric acid.1

Hyperuricemia results either from excess production of uric acid, not enough excretion, or a combination of both. Underexcretion is the primary cause of hyperuricemia in about 90% of cases, while overproduction is the cause in less than 10%.2

However, high blood levels of uric acid don’t necessarily mean you’ll develop gout. It only increases the risk based upon varying degrees of hyperuricemia. When blood levels are between 7 and 8.9 mg/dL, the risk of gout is less than 1% per year.3 But when uric acid levels are greater than 9 mg/dL, the risk of developing gout is 6 times higher.4-7

All of this is why the mainstay of gout treatment is preventing hyperuricemia. Unfortunately for a lot of us, this can be tough as gender, menopause, and genetics play a role. Men and post-menopausal women produce the most uric acid. If you fall into one of these two groups, you might consider taking preventative measures.
Research also shows that hyperuricemia is a genetic trait. Genetic studies have demonstrated a high degree of similarity (concordance) of hyperuricemia between pairs of twins, 53% for identical twins and 24% for fraternal twins. But there’s good news for those of us at increased risk. All of the studies indicate that environmental factors substantially influence whether or not a predisposition for hyperuricemia will actually result in gout. Or simply put...lifestyle is a driving force behind the development of hyperuricemia and gout.

Here are a few lifestyle tips for preventing hyperuricemia:

• **Avoid excessive alcohol.** Drinking too much can interfere with the removal of uric acid from the body. Remember, underexcretion is the primary way it builds up.

• **Limit dietary purines.** This includes red meats, pork, lamb, and seafood.

• **Maintain a healthy weight.** Obesity increases the risk of gout. One theory is that excess body weight causes rapid turnover of body tissues, increasing the need for purines and nucleic acids. The end result is more uric acid production.

• **Optimize kidney health.** Since underexcretion causes 90% of hyperuricemia cases, improving and maintaining kidney function is important.

• **Optimize thyroid function.** Hypothyroidism is associated with gout.

• **Optimize blood pressure.** Hypertension is associated with gout.

• **Lower lead in your body.** Chronic exposure has been linked to some cases of gout.

**Minimize use of prescription diuretics.** Medications that increase urine flow are associated with gout. Talk to your doctor if you’re at an increased risk for gout and discuss alternatives for treating high blood pressure.

**Treat sleep apnea.** A recent study in *Arthritis & Rheumatology* has found that sleep apnea is an independent risk factor of gout.

**LE:** How does gout increase my risk of heart disease?

**MS:** Gout is bad for your heart because it’s associated with diabetes and obesity, which are two independent risk factors of heart disease. For instance, the odds of developing gout are almost 4 times higher for diabetics than nondiabetics. However, in the last few years, reports indicate that the underlying cause of gout, hyperuricemia, may in fact be an independent risk factor of cardiovascular disease. And the likely culprit is chronic inflammation.

Uric acid’s crystalline structure appears to activate the immune system and trigger a robust inflammatory reaction. Detailed analysis of uric acid’s role in initiating inflammation reveals a complex and powerful interaction between uric acid crystals, immune cells, multiple chemical signals, and eventual production of a powerful inflammatory protein, interleukin-1-beta.

Once released into circulation, interleukin-1-beta signals the activation of more and more immune cells and inflammatory proteins, resulting in a destructive inflammatory response.

Chronically elevated, inflammation can damage cells and tissues throughout the body, making it the common denominator of age-related disorders, including heart disease.

**LE:** Why is gout so painful?

**MS:** Gout is painful because needle-like crystals of uric acid are piercing joint tissues. And, as if that weren’t enough, the crystals
also initiate a powerful inflammatory response that causes redness, swelling, and heat. This occurs within tight joint spaces with little ability to expand and relieve pressure. It's so painful that a 2010 Gout Attitudes Patient Survey reported 37% of people with the disease would trade a winning lottery ticket for an assurance of never suffering another flare-up of acute gout.12

The survey, developed by the Men’s Health Network and Takeda Pharmaceuticals North America Inc., also found that:

• 23% compare the pain to shattered glass piercing their skin, 28% to breaking a bone, 34% to a severe burn, and 37% to a stubbed toe.
• 69% describe the pain of an attack as “miserable.”
• 73% reported limited physical activity.
• 27% of gout patients say the disease causes them to take time off from work.
• 43% said they had canceled social plans because of a gout attack.
• 36% said they would leave their homes more often if they did not have gout.

This is why people suffering from acute gout are willing to ingest large quantities of prescription and over-the-counter pain medications. But the possibility of severe side effects has some patients searching for safer ways to control the pain. Cherries can help. Several studies provide strong evidence that the anthocyanins from cherries relieve pain and reduce inflammation. An animal study conducted at Johns Hopkins Hospital found that tart cherry extracts provided relief from painful inflammation comparable to the nonsteroidal anti-inflammatory drug indomethacin.13

Korean angelica is another alternative to side-effect prone pain medications. Used in traditional herbal medicine as a pain reliever, Korean angelica fights pain through its effects on the brain. This makes it useful for many types of pain, including the painful inflammation characterizing gout.14

Curcumin and Boswellia are additional alternatives simply because they are so effective at inhibiting powerful inflammatory pathways that are activated during acute gout.

LE: How is gout diagnosed?

MS: Classically, hyperuricemia and podagra (swollen, red big toe) are enough to make the diagnosis of gout. However, clinicians will tell you that gout doesn’t only affect the big toe. Just about any joint can be involved. So that leaves hyperuricemia (uric acid level greater than 8.6 mg/dL in men and 7.1 mg/dL in women) and severe pain in at least one joint as the criteria for most clinicians to call it gout. But keep in mind that gout occurs without hyperuricemia, and many people with raised uric acid levels never develop gout.

In cases with normal uric acid levels, synovial fluid analysis should be considered. Although some doctors might treat for gout without one, the presence of large needle-shaped crystals within the joint fluid confirms the diagnosis and can be used to differentiate gout from pseudogout or septic arthritis.

By the way, outside of ruling out a fracture, you probably can forgo the X-ray if your doctor orders one. It won’t help in diagnosing acute gout, and should only be used to evaluate bone and joint erosions in chronic gout.

LE: If I already have high uric acid levels during an acute attack, how can I bring my levels down quickly without using prescription drugs?

MS: During an acute attack, lowering uric acid isn’t beneficial. Instead, focus on quickly reducing inflammation. Start by icing and resting the affected joint. Talk with your doctor about conventional medications such as nonsteroidal anti-inflammatory drugs (NSAIDs), colchicine, glucocorticoids, and biologic agents that inhibit interleukin-1 beta. They might be appropriate for you, but they also have the potential for severe side effects.

Although not as effective in reducing inflammation from gout individually, natural extracts when taken together can be safe and effective at reducing acute inflammation. However, the quick progression and resolution of acute gout may make it less amenable to nutrient “interventions,” many of which have only been tested for their long-term effects on inflammation.

But there are specific nutrients that target joint inflammation and inflammatory signals, including interleukin-1-beta. Taking them together, at a slightly higher-than-normal dose, for a short duration, may produce the wanted results. Curcumin, omega-3 fatty acids, and resveratrol may be especially suited for this purpose.

LE: I have chronically elevated uric acid. Luckily, I haven’t had gout, but I don’t want to keep pushing the odds. What are my top choices for reducing uric acid naturally?

MS: The immediate “natural” thing to do is change your diet.
Limit red meat, eat more vegetable protein, and drink more water. Reduce alcohol intake and eliminate sugar sweetened drinks from your diet as well. All of this will help to lower dietary purines involved in the excessive uric acid production.

Once dietary changes are in effect, your next choice could be an extract from the fruit of Terminalia bellerica. Used in Ayurveda medicine for many years, researchers have now shown that T. bellerica provides compounds that may inhibit xanthine oxidase, an enzyme involved in the production of uric acid.4

In subjects with elevated uric acid levels, 500 mg twice a day of Terminalia bellerica extract decreased uric acid by a little over 27%.4

Vitamin C is also a xanthine oxidase inhibitor and is a good second choice. In a comprehensive review of 13 clinical studies, using an average dose of 500 mg per day, uric acid was reduced on average by 0.35 mg/dL.15

I already mentioned tart cherries for reducing pain. Well, they also reduce uric acid levels. A small set of case studies in the 1950s documented decreased duration and severity of gout attacks in people on cherry-supplemented diets.16

A more recent investigation demonstrated that following a single dose of 280 grams of cherries, the blood urate levels in 10 healthy women dropped 14% after five hours. Additionally, markers of inflammation (like C-reactive protein, CRP) also decreased slightly.17

And rounding out the natural choices is coffee. A well-conducted large study says four cups a day of coffee will reduce the risk of gout.18 It’s believed caffeine is providing the benefit as a xanthine oxidase inhibitor. But interestingly, decaffeinated coffee also reduced the risk of gout. This implies that other compounds in coffee may also be important.

Because of the intense inflammatory response associated with hyperuricemia and gout, it’s important to recognize if you’re at risk and take appropriate steps to reduce inflammation and prevent the build up of uric acid. Remember, gout is not just causing pain in your joints, it can negatively affect other parts of your body.

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

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<td>21.00</td>
</tr>
<tr>
<td>ARTCHOKE LEAF EXTRACT • 500 mg, 180 veg. caps</td>
<td>30.00</td>
<td>22.50</td>
<td>21.00</td>
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<td>ASCORBYL PALMITATE • 500 mg, 100 veg. caps</td>
<td>22.50</td>
<td>16.88</td>
<td>15.00</td>
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<td>ASHWAGANDHA EXTRACT (Optimized) • 60 veg. caps</td>
<td>10.00</td>
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<tr>
<td>ASIAN ENERGY BOOST • 90 veg. caps</td>
<td>24.00</td>
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<td>ASPIRIN • 81 mg, 300 enteric coated tablets</td>
<td>6.00</td>
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<td>ASTAXANTHIN WITH PHOSPHOLIPIDS • 4 mg, 30 softgels</td>
<td>16.00</td>
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<tr>
<td>BENFOTIANINE W/THIAMINE • 100 mg, 120 veg. caps</td>
<td>19.95</td>
<td>14.96</td>
<td>13.95</td>
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<tr>
<td>BENFOTIANINE (Mega) • 250 mg, 120 veg. caps</td>
<td>30.00</td>
<td>22.50</td>
<td>20.25</td>
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<tr>
<td>BERRY COMPLETE • 30 veg. caps</td>
<td>21.00</td>
<td>15.75</td>
<td>14.00</td>
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<td>BERRY COMPLETE W/ACAI (Enhanced) • 60 veg. caps</td>
<td>29.00</td>
<td>21.75</td>
<td>19.50</td>
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<tr>
<td>BETA-CAROTENE • 25,000 IU, 100 softgels</td>
<td>11.25</td>
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<td>BIFIDO GI BALANCE • 60 veg. caps</td>
<td>20.00</td>
<td>15.00</td>
<td>13.50</td>
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<td>BILBERRY EXTRACT • 100 mg, 100 veg. caps</td>
<td>42.00</td>
<td>31.50</td>
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<tr>
<td>BIOACTIVE MILK PEPTIDES • 30 caps</td>
<td>18.00</td>
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<td>12.00</td>
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<tr>
<td>BIO-COLLAGEN W/PATENTED UC-II® • 40 mg, 60 small caps</td>
<td>36.00</td>
<td>27.00</td>
<td>24.00</td>
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<tr>
<td>BIOSIL™ • 5 mg, 30 veg. caps</td>
<td>18.95</td>
<td>15.16</td>
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<tr>
<td>BIOSIL™ • 1 fl oz</td>
<td>31.99</td>
<td>25.99</td>
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<tr>
<td>BIOTIN • 600 mcg, 100 caps</td>
<td>7.50</td>
<td>5.63</td>
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<tr>
<td>BLACK CUMIN SEED OIL • 60 softgels</td>
<td>16.00</td>
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<td>10.50</td>
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<td>BLACK CUMIN SEED OIL W/BIO-CURCUMIN® • 60 softgels</td>
<td>32.00</td>
<td>24.00</td>
<td>22.50</td>
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<tr>
<td>BLAST™ • 600 grams of powder</td>
<td>26.95</td>
<td>20.21</td>
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<tr>
<td>BLOOD PRESSURE MONITOR (ACCUFIT™) • med/lg cuff</td>
<td>79.99</td>
<td>49.99</td>
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<tr>
<td>BLOOD PRESSURE MONITOR • Digital wrist cuff</td>
<td>69.95</td>
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**SUBTOTAL OF COLUMN 1**

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<th>RETAIL EACH</th>
<th>UNIT EACH</th>
<th>QTY TOTAL</th>
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</thead>
<tbody>
<tr>
<td>BLUEBERRY EXTRACT • 60 veg. caps</td>
<td>22.50</td>
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<td>15.00</td>
</tr>
<tr>
<td>BLUEBERRY EXTRACT W/POMEGRANATE • 60 veg. caps</td>
<td>30.00</td>
<td>22.50</td>
<td>20.25</td>
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<tr>
<td>BONE FORMULA (DR. STRUM’S INTENSIVE) • 300 caps</td>
<td>56.00</td>
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<tr>
<td>BONE RESTORE • 120 caps</td>
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<td>BONE RESTORE W/VITAMIN K2 • 120 caps</td>
<td>24.00</td>
<td>18.00</td>
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<td>BONE STRENGTH FORMULA W/KOACT® • 120 caps</td>
<td>45.00</td>
<td>33.75</td>
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<tr>
<td>BONE-UP® • 240 caps</td>
<td>28.95</td>
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<td>BORON • 3 mg, 100 veg. caps</td>
<td>5.95</td>
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<td>3.94</td>
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<td>BOSWELLA • 100 caps</td>
<td>38.00</td>
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<tr>
<td>BRAIN SHIELD® GASTRODIN • 300 mg, 60 veg. caps</td>
<td>33.00</td>
<td>24.75</td>
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<tr>
<td>BRANCHED CHAIN AMINO ACIDS • 90 caps</td>
<td>19.50</td>
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<td>12.75</td>
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<tr>
<td>BREATHE HEALTH FORMULA • 60 caps</td>
<td>34.00</td>
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<tr>
<td>BRITE EYES III • 2 vials, 5 ml each</td>
<td>34.00</td>
<td>25.50</td>
<td>24.00</td>
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<tr>
<td>BROCCO MAX® • 60 veg. caps</td>
<td>26.95</td>
<td>20.21</td>
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<tr>
<td>BROMELAIN (Speciality-coated) 500 mg, 60 enteric coated tablets</td>
<td>21.00</td>
<td>15.75</td>
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| **SUBTOTAL OF COLUMN 2**

MARCH 2016

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>1 Unit Each $</th>
<th>QTY Total</th>
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<td>01040</td>
<td>ESSENTIAL PLANT LIPIDS REPARATIVE SERUM</td>
<td>46.00 34.50 28.00 26.25</td>
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<tr>
<td>01103</td>
<td>MILD FACIAL CLEANSER - 8 oz</td>
<td>59.00 44.25 38.94</td>
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</tr>
<tr>
<td>01158</td>
<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super ubiquinol)</td>
<td>100 mg, 60 softgels</td>
<td>54.00 34.50 28.00 26.25</td>
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<tr>
<td>01275</td>
<td>CYPATONE® WITH ELLIROSETM</td>
<td>2 oz</td>
<td>65.00 48.75 42.75</td>
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<tr>
<td>01314</td>
<td>NECK REJUVENATING ANTIOXIDANT CREAM</td>
<td>1 oz</td>
<td>58.00 43.50 34.50 31.50</td>
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<tr>
<td>01328</td>
<td>SKIN LIGHTENING SERUM</td>
<td>1 oz</td>
<td>85.00 63.75 56.10</td>
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<tr>
<td>01363</td>
<td>VITAMIN D LOTION</td>
<td>1 oz</td>
<td>65.00 49.00 43.50</td>
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<tr>
<td>01377</td>
<td>UNDER EYE REFINING SERUM</td>
<td>2 oz</td>
<td>28.00 21.00 19.50</td>
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<tr>
<td>01381</td>
<td>UNDER EYE RESCUE CREAM</td>
<td>1 oz</td>
<td>74.50 55.88 48.17</td>
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<tr>
<td>01389</td>
<td>MILD FACIAL CLEANSER - 8 oz</td>
<td>59.00 44.25 38.94</td>
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<tr>
<td>01401</td>
<td>ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 oz</td>
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<td>01444</td>
<td>BROCCOLI SPROUT CREAM</td>
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<td>ULTRA LIP PLUMPER - 1/3 oz</td>
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<td>01464</td>
<td>LIFETIME® DHEA</td>
<td>25 mg, 100 caps</td>
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<td>01478</td>
<td>7-KETO® DHEA</td>
<td>25 mg, 100 caps</td>
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<tr>
<td>01440</td>
<td>DHA (Vegetarian sourced)</td>
<td>30 veg. softgels</td>
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<tr>
<td>01461</td>
<td>REUSING DERMABRASION</td>
<td>2 oz</td>
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<tr>
<td>01467</td>
<td>VITAMIN D LOTION</td>
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<tr>
<td>01471</td>
<td>DHA COMPLETE</td>
<td>60 veg. caps</td>
<td>48.00 36.00 32.40</td>
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<tr>
<td>01480</td>
<td>CARNITINE</td>
<td>1000 mg, 60 veg. caps</td>
<td>89.00 66.75 56.50</td>
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<tr>
<td>01484</td>
<td>VITAMIN B-6</td>
<td>100 mg, 60 softgels</td>
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<td>01494</td>
<td>FINE LINE-LESS</td>
<td>1 oz</td>
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<tr>
<td>01498</td>
<td>D, L-PHENYLALANINE</td>
<td>2 oz</td>
<td>65.00 48.75 42.75</td>
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<tr>
<td>01502</td>
<td>CRAN-MAX® WITH ELLIROSETM</td>
<td>1 oz</td>
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<tr>
<td>01509</td>
<td>CRAN-MAX®</td>
<td>500 mg, 60 veg. caps</td>
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<tr>
<td>01517</td>
<td>CRAN-MAX® • ELLIROSETM Optimized</td>
<td>• 60 veg. caps</td>
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<tr>
<td>01529</td>
<td>CREATINE CAPSULES</td>
<td>120 veg. caps</td>
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<tr>
<td>01574</td>
<td>CREATINE WHEY GLUTAMINE POWDER</td>
<td>454 grams (vanilla)</td>
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<tr>
<td>01586</td>
<td>CYTOKINE SUPPRESS™ W/ESCG</td>
<td>30 veg. caps</td>
<td>30.00 22.50 20.25</td>
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<tr>
<td>01589</td>
<td>DAILY C+ CITRUS FLAVOR</td>
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<td>01677</td>
<td>D, L-PHENYLALANINE</td>
<td>500 mg, 100 veg. caps</td>
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<td>01689</td>
<td>NECK REJUVENATING ANTIOXIDANT CREAM</td>
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<tr>
<td>01690</td>
<td>Renewing EYE CREAM</td>
<td>• 1/2 oz</td>
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<tr>
<td>01692</td>
<td>SKIN REJUVENATION CREAM</td>
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<tr>
<td>01693</td>
<td>SKIN TIGHTENING SERUM</td>
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<tr>
<td>01695</td>
<td>SKIN LIGHTENING SERUM</td>
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<tr>
<td>01702</td>
<td>BETA CAROTENE</td>
<td>100 mg, 60 softgels</td>
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<td>ESSENTIAL PLANT LIPIDS REPARATIVE SERUM</td>
<td>• 1 oz</td>
<td>74.95 56.21 49.46</td>
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<tr>
<td>01711</td>
<td>MILD FACIAL CLEANSER - 8 oz</td>
<td>59.00 44.25 38.94</td>
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<td>01712</td>
<td>REUSING DERMABRASION</td>
<td>• 2 oz</td>
<td>99.00 74.25 65.00</td>
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<td>01716</td>
<td>VITAMIN C SERUM</td>
<td>1 oz</td>
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<td>01725</td>
<td>CARNITINE</td>
<td>1000 mg, 60 veg. caps</td>
<td>89.00 66.75 56.50</td>
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<td>01732</td>
<td>CRAN-MAX®</td>
<td>500 mg, 60 veg. caps</td>
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<td>01733</td>
<td>CRAN-MAX®</td>
<td>1000 mg, 30 softgels</td>
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<td>01737</td>
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<td>01752</td>
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<td>01762</td>
<td>CRAN-MAX®</td>
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</table>

**SUBTOTAL OF COLUMN 3**

**SUBTOTAL OF COLUMN 4**

**MARCH 2016**

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

**TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: www.LifeExtension.com**
### E

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>01528</td>
<td>ECHINACEA EXTRACT • 250 mg, 60 veg. caps</td>
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<tr>
<td>01997</td>
<td>ENDOTHELIAL DEFENSE® w/FULL-SPECTRUM POMEGRA NATE® AND COR DIANTM • 60 softgels</td>
</tr>
<tr>
<td>00997</td>
<td>ENDOTHELIAL DEFENSE® w/GLISODIN® • 60 veg. caps</td>
</tr>
<tr>
<td>00625</td>
<td>EPA/DHA (Mega) • 120 softgels</td>
</tr>
<tr>
<td>01737</td>
<td>ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets</td>
</tr>
<tr>
<td>01042</td>
<td>EUROPEAN LEG SOLUTION DIOSMIN 95 600 mg, 30 veg. tabs</td>
</tr>
<tr>
<td>01706</td>
<td>EXTRAORDINARY ENZYMES • 60 caps</td>
</tr>
<tr>
<td>01514</td>
<td>EYE PRESSURE SUPPORT W/MIRTGENOL® • 30 veg. caps</td>
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### F

<table>
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<th>PRODUCT</th>
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</thead>
<tbody>
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<td>*01054</td>
<td>FACE MASTER® PLATINUM • Facial Toning System</td>
</tr>
<tr>
<td>00965</td>
<td>FAST-ACTING JOINT FORMULA • 30 caps</td>
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<tr>
<td>01717</td>
<td>FAST-C® W/DIHYDROQUERCETIN • 120 veg. tabs</td>
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<tr>
<td>02005</td>
<td>FEM DOPHILUS® • 30 caps</td>
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<tr>
<td>02005</td>
<td>FEM DOPHILUS® • 60 caps</td>
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<tr>
<td>01064</td>
<td>FEMMENESSENCE MACA/PAESE® • 120 veg. caps</td>
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<tr>
<td>01726</td>
<td>FERNBLOCK® W/RED ORANGE COMPLEX (Enhanced) 30 veg. caps</td>
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<tr>
<td>00718</td>
<td>FIBRINOGEN RESIST™ • 30 veg. caps</td>
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<tr>
<td>01749</td>
<td>FLAX SEED (Organic golden) • 1 oz</td>
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<tr>
<td>01821</td>
<td>FLORASSIST® HEART HEALTH PROBIOTIC • 60 veg. caps</td>
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<tr>
<td>02011</td>
<td>FLORASSIST® ORAL HYGIENE • 30 lozenges</td>
</tr>
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<td>01825</td>
<td>FLORASSIST® BALANCE • 30 liquid veg. caps</td>
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<td>02000</td>
<td>FLORASSIST® MOOD • 60 caps</td>
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<tr>
<td>01920</td>
<td>FLORASSIST® THROAT HEALTH • 30 lozenges</td>
</tr>
<tr>
<td>01913</td>
<td>FOLATE (Optimized) • 5,000 mcg, 30 veg. tablets</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 (Bio Active) • 90 veg. caps</td>
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<tr>
<td>01544</td>
<td>FORSKOLIN • 10 mg, 60 veg. caps</td>
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<tr>
<td>01513</td>
<td>FUCOIDAN W/MARITECH® 925 (Optimized) • 60 veg. caps</td>
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### G

<table>
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<tr>
<th>ITEM No.</th>
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<tbody>
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<td>00559</td>
<td>GAMMA E TOCopherOL/TOCoTIERs • 60 softgels</td>
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<tr>
<td>00759</td>
<td>GAMMA E TOCopherOL W/SESAME LIGNANS • 60 softgels</td>
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<tr>
<td>01394</td>
<td>GARLIC (Optimized) • 200 veg. caps</td>
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<tr>
<td>*01122</td>
<td>GINGER FORCE® • 60 liquid caps</td>
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<tr>
<td>01658</td>
<td>GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps</td>
</tr>
<tr>
<td>00756</td>
<td>GLA WITH SESAME LIGNANS (Mega) • 60 softgels</td>
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### SUBTOTAL OF COLUMN 5

<table>
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<tr>
<th>ITEM No.</th>
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<td>00345</td>
<td>(L-) GLUTAMINE CAPSULES • 500 mg, 100 caps</td>
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<tr>
<td>00141</td>
<td>(L-) GLUTAMINE POWDER • 100 grams</td>
</tr>
<tr>
<td>00524</td>
<td>GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps</td>
</tr>
<tr>
<td>00514</td>
<td>GLUTATHIONE, CYSTEINE &amp; C • 100 veg. caps</td>
</tr>
<tr>
<td>00314</td>
<td>L-GLUTATHIONE (Mega) • 250 mg, 60 caps</td>
</tr>
<tr>
<td>01169</td>
<td>GLYCINE • 1,000 mg, 100 veg. caps</td>
</tr>
<tr>
<td>01411</td>
<td>GRAPE SEED EXTRACT W/RESVERATROL &amp; PTEROSTILBENE 100 mg, 60 veg. caps</td>
</tr>
<tr>
<td>01604</td>
<td>GREEN COFFEE EXTRACT COFFEENIC® 200 mg, 90 veg. caps</td>
</tr>
<tr>
<td>01620</td>
<td>GREEN COFFEE EXTRACT COFFEENIC® 400 mg, 90 veg. caps</td>
</tr>
<tr>
<td>00953</td>
<td>GREEN TEA EXTRACT (Mega) • lightly caffeinated, 100 veg. caps</td>
</tr>
<tr>
<td>00954</td>
<td>GREEN TEA EXTRACT (Mega) • decaffeinated, 100 veg. caps</td>
</tr>
</tbody>
</table>

### H

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>01074</td>
<td>5 HTP • 100 mg, 60 caps</td>
</tr>
<tr>
<td>*02002</td>
<td>HAIR, SKIN &amp; NAIL REJUVENATION FORM W/VERUSN® 90 tabs</td>
</tr>
<tr>
<td>01738</td>
<td>HCA (Garcinia) • 90 veg. caps</td>
</tr>
<tr>
<td>29754</td>
<td>HCACTIVE™ GARCINIA CAMBOGIA EXTRACT • 90 caps</td>
</tr>
<tr>
<td>01393</td>
<td>HEPATOPRO • 900 mg, 60 softgels</td>
</tr>
<tr>
<td>01527</td>
<td>HUPERZINE A • 200 mcg, 60 veg. caps</td>
</tr>
<tr>
<td>00661</td>
<td>HYDRODERM® • 1 oz</td>
</tr>
</tbody>
</table>

### I

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
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</thead>
<tbody>
<tr>
<td>*01061</td>
<td>I26 HYPERIMMUNE EGG • 140 grams powder</td>
</tr>
<tr>
<td>01704</td>
<td>IMMUNE MODULATOR W/TINOGEN® • 60 veg. caps</td>
</tr>
<tr>
<td>00955</td>
<td>IMMUNE PROTECT W/PARACTIN® • 30 veg. caps</td>
</tr>
<tr>
<td>02005</td>
<td>IMMUNE SENESCENCE PROTECTION FORMULATM • 60 veg. tabs</td>
</tr>
<tr>
<td>01049</td>
<td>INNERPOWER™ • 530 grams powder</td>
</tr>
<tr>
<td>01674</td>
<td>INOSITOL CAPSULES • 1,000 mg, 360 veg. caps</td>
</tr>
<tr>
<td>01292</td>
<td>INTEGRA-LEAH® AFRICAN MANGO IRVINGIA 150 mg, 60 veg. caps</td>
</tr>
<tr>
<td>01248</td>
<td>IODINE COMPLETE (Advanced) • 12.5 mg, 180 tablets</td>
</tr>
<tr>
<td>01677</td>
<td>IRON PROTEIN PLUS • 300 mg, 100 caps</td>
</tr>
<tr>
<td>01492</td>
<td>IRVINGIA WITH PHASE 3™ CALORIE CONTROL COMPLEX (Optimized African Mango) • 120 veg. caps</td>
</tr>
</tbody>
</table>

### J, K, L

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>00056</td>
<td>JARRO-DOPHILUS EPS® • 60 veg. caps</td>
</tr>
<tr>
<td>01834</td>
<td>K W/ADVANCED K2 COMPLEX (Super) • 90 softgels</td>
</tr>
<tr>
<td>01600</td>
<td>KIRILL HEALTHY JOINT FORMULA • 30 softgels</td>
</tr>
<tr>
<td>01050</td>
<td>KIRILL OIL • 60 softgels</td>
</tr>
<tr>
<td>00316</td>
<td>KYolic® GARLIC FORMULA 102 • 200 veg. caps</td>
</tr>
<tr>
<td>00214</td>
<td>KYolic® GARLIC FORMULA 105 • 250 veg. caps</td>
</tr>
<tr>
<td>00789</td>
<td>KYolic® RESERVE • 600 mg, 120 caps</td>
</tr>
<tr>
<td>01681</td>
<td>LACTOFERRIN • 60 caps</td>
</tr>
<tr>
<td>00020</td>
<td>LECITHIN • 16 oz granules</td>
</tr>
<tr>
<td>02055</td>
<td>LIFE EXTENSION MIX™ • 315 tablets</td>
</tr>
<tr>
<td>02057</td>
<td>LIFE EXTENSION MIX™ W/EXTRA NICIN • 315 tablets</td>
</tr>
<tr>
<td>02054</td>
<td>LIFE EXTENSION MIX™ • 490 caps</td>
</tr>
</tbody>
</table>

### SUBTOTAL OF COLUMN 6

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
<th>QTY Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>02065</td>
<td>LIFE EXTENSION MIX™ POWDER • 14.81 oz</td>
<td>$18.00</td>
<td>24</td>
</tr>
<tr>
<td>02066</td>
<td>LIFE EXTENSION MIX™ • 315 tablets w/o copper</td>
<td>$24.00</td>
<td>36</td>
</tr>
<tr>
<td>02064</td>
<td>LIFE EXTENSION MIX™ • 490 caps w/o copper</td>
<td>$30.00</td>
<td>45</td>
</tr>
<tr>
<td>02063</td>
<td>LIFE EXTENSION MIX™ • 14.81 oz w/o copper</td>
<td>$32.00</td>
<td>46</td>
</tr>
<tr>
<td>01606</td>
<td>LIVER EFFICIENCY FORMULA • 30 veg. caps</td>
<td>$18.00</td>
<td>24</td>
</tr>
<tr>
<td>01639</td>
<td>5-LOX INHIBITOR W/APHESL®* • 100 mg, 60 veg. caps</td>
<td>$22.00</td>
<td>28</td>
</tr>
<tr>
<td>01678</td>
<td>L-LYSINE • 620 mg, 100 veg. caps</td>
<td>$5.00</td>
<td>10</td>
</tr>
<tr>
<td>00455</td>
<td>LYCOPENE (Mega) • 15 mg, 90 softgels</td>
<td>$35.00</td>
<td>40</td>
</tr>
<tr>
<td>01522</td>
<td>MSM</td>
<td>$7.00</td>
<td>10</td>
</tr>
<tr>
<td>01534</td>
<td>MK-7</td>
<td>$10.00</td>
<td>10</td>
</tr>
<tr>
<td>00709</td>
<td>MIGRA-EZEE™ (Butterbur) • 60 softgels</td>
<td>$29.50</td>
<td>35</td>
</tr>
<tr>
<td>01525</td>
<td>MILK THISTLE (European) • 60 veg. caps</td>
<td>$24.00</td>
<td>30</td>
</tr>
<tr>
<td>01822</td>
<td>MILK THISTLE (European) • 60 softgels</td>
<td>$28.00</td>
<td>35</td>
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<tr>
<td>01920</td>
<td>MILK THISTLE (European) • 120 softgels</td>
<td>$40.00</td>
<td>50</td>
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<tr>
<td>01689</td>
<td>MIRAFORE W/STANDARDIZED LIGNANS (Super) • 120 caps</td>
<td>$52.00</td>
<td>65</td>
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<tr>
<td>01869</td>
<td>MITOCONDRIAL BASICS W/BIOPQQ® • 30 caps</td>
<td>$44.00</td>
<td>55</td>
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<tr>
<td>00655</td>
<td>MK-7 • 90 mcg, 60 softgels</td>
<td>$28.00</td>
<td>35</td>
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<tr>
<td>00451</td>
<td>MSM (Methylsulfonylmethane) • 1,000 mg, 100 caps</td>
<td>$14.00</td>
<td>10</td>
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**SUBTOTAL OF COLUMN 8**
<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
<th>QTY Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01327</td>
<td>SAFFRON</td>
<td>200 mg, 30 enteric coated tablets</td>
<td>25.00</td>
</tr>
<tr>
<td>01518</td>
<td>RIBOSAMINE</td>
<td>300 mg, 60 veg. caps</td>
<td>30.00</td>
</tr>
<tr>
<td>01496</td>
<td>RIBOSAMINE</td>
<td>500 mg, 90 veg. caps</td>
<td>33.00</td>
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<tr>
<td>01490</td>
<td>RIBOSAMINE</td>
<td>60 veg. caps</td>
<td>28.00</td>
</tr>
<tr>
<td>01489</td>
<td>RHODIOL Extract</td>
<td>250 mg, 60 veg. caps</td>
<td>46.00</td>
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<tr>
<td>00889</td>
<td>RHODIOL Extract</td>
<td>30 veg. caps</td>
<td>14.00</td>
</tr>
<tr>
<td>01900</td>
<td>RIBOGEN® French Oak Wood Extract</td>
<td>200 mg, 30 veg. caps</td>
<td>36.00</td>
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<tr>
<td>00972</td>
<td>(D) RIBOSE Powder</td>
<td>150 grams</td>
<td>27.50</td>
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<tr>
<td>01473</td>
<td>(D) RIBOSE Tablets</td>
<td>100 veg. tabs</td>
<td>32.00</td>
</tr>
<tr>
<td>01609</td>
<td>RICH REWARDS® Breakfast Ground Coffee</td>
<td>12 oz. bag</td>
<td>13.00</td>
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<tr>
<td>01730</td>
<td>RICH REWARDS® Breakfast Blend Ground Coffee</td>
<td>Natural Mocha</td>
<td>15.00</td>
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<tr>
<td>01729</td>
<td>RICH REWARDS® Breakfast Blend Ground Coffee</td>
<td>Natural Vanilla</td>
<td>15.00</td>
</tr>
<tr>
<td>01612</td>
<td>RICH REWARDS® Breakfast Blend Whole Bean Coffee</td>
<td>12 oz. bag</td>
<td>13.00</td>
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<tr>
<td>01610</td>
<td>RICH REWARDS® Decaffeinated Roast Ground Coffee</td>
<td>12 oz. bag</td>
<td>14.00</td>
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<tr>
<td>01208</td>
<td>R-LIPOIC ACID</td>
<td>(Super)</td>
<td>49.00</td>
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<tr>
<td>00070</td>
<td>RNA Capsules</td>
<td>500 mg, 100 caps</td>
<td>17.95</td>
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<tr>
<td>01423</td>
<td>SAFFRON &amp; SATenuine®</td>
<td>(Optimized)</td>
<td>36.00</td>
</tr>
<tr>
<td>01935</td>
<td>SAMe (S-ADENOSYL-METHIONINE)</td>
<td>200 mg, 30 enteric coated tablets</td>
<td>25.00</td>
</tr>
</tbody>
</table>

**SUBTOTAL OF COLUMN 9**

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
<th>QTY Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01933</td>
<td>SAMe (S-ADENOSYL-METHIONINE)</td>
<td>400 mg, 30 enteric coated tablets</td>
<td>36.00</td>
</tr>
<tr>
<td>01934</td>
<td>SAMe (S-ADENOSYL-METHIONINE)</td>
<td>600 mg, 60 enteric coated tablets</td>
<td>66.00</td>
</tr>
<tr>
<td>01740</td>
<td>SEA-IONINE™</td>
<td>1,000 mcg, 60 veg. caps</td>
<td>8.00</td>
</tr>
<tr>
<td>00046</td>
<td>Selenium</td>
<td>“2 fl. oz dropper”</td>
<td>11.95</td>
</tr>
<tr>
<td>01679</td>
<td>SE-METHYL L-SELENOCYSTEINE</td>
<td>200 mcg, 100 veg. caps</td>
<td>12.00</td>
</tr>
<tr>
<td>00318</td>
<td>SERRAFLAVYME®</td>
<td>100 tablets</td>
<td>18.00</td>
</tr>
<tr>
<td>01884</td>
<td>SILYMARIN</td>
<td>100 mg, 90 veg. caps</td>
<td>14.00</td>
</tr>
<tr>
<td>01249</td>
<td>SINEUS CLEANSER</td>
<td>4 oz. bottle</td>
<td>25.00</td>
</tr>
<tr>
<td>01596</td>
<td>SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT®</td>
<td>30 liquid veg. caps</td>
<td>25.00</td>
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<tr>
<td>00961</td>
<td>SOZYNEM® w/GLISOIN® &amp; WOLFBERY</td>
<td>90 veg. caps</td>
<td>28.00</td>
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<tr>
<td>00657</td>
<td>SOLARSHIELD® SUNGLASSES</td>
<td>Smoke color</td>
<td>12.99</td>
</tr>
<tr>
<td>01097</td>
<td>SOY EXTRACT (Ultra)</td>
<td>150 veg. caps</td>
<td>87.00</td>
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<tr>
<td>00432</td>
<td>STEVIA® (Better)</td>
<td>100 packets, 1 gram each</td>
<td>9.95</td>
</tr>
<tr>
<td>00438</td>
<td>STEVIA® ORGANIC LIQUID SWEETENER (Better)</td>
<td>2 oz</td>
<td>11.00</td>
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<tr>
<td>01476</td>
<td>STRONTIUM</td>
<td>750 mg, 90 veg. caps</td>
<td>20.00</td>
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<tr>
<td>01649</td>
<td>SUPER ABSORBABLE SOY ISOLFLAVONES</td>
<td>60 veg. caps</td>
<td>28.00</td>
</tr>
<tr>
<td>01778</td>
<td>SUPER SELENIUM COMPLEX</td>
<td>200 mcg, 100 veg. caps</td>
<td>14.00</td>
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</tbody>
</table>

**SUBTOTAL OF COLUMN 10**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
**0105** TWO-PER-DAY • 120 tablets  
YOUR PRICE

**0204** TWO-PER-DAY • 120 caps  
YOUR PRICE

**00326** L-TYROSINE • 500 mg, 100 tablets  
YOUR PRICE

<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>
</tr>
</thead>
<tbody>
<tr>
<td>02015</td>
<td>TWO-PER-DAY • 120 tablets</td>
<td>20.00</td>
<td>15.00</td>
<td>13.50</td>
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<tr>
<td>02014</td>
<td>TWO-PER-DAY • 120 caps</td>
<td>22.00</td>
<td>18.50</td>
<td>15.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00326</td>
<td>L-TYROSINE • 500 mg, 100 tablets</td>
<td>12.98</td>
<td>9.74</td>
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<td></td>
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</tbody>
</table>

**U, V**

<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>
<th>QTY Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0192</td>
<td>URIC ACID CONTROL • 60 veg. caps</td>
<td>24.00</td>
<td>18.00</td>
<td>16.50</td>
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<td></td>
</tr>
<tr>
<td>02017</td>
<td>VANADYL SULFATE • 7.5 mg, 100 veg. tablets</td>
<td>15.00</td>
<td>11.25</td>
<td>9.38</td>
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<tr>
<td>00407</td>
<td>VENOTONE • 60 caps</td>
<td>18.95</td>
<td>14.21</td>
<td>12.00</td>
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</tr>
<tr>
<td>01327</td>
<td>VINPOCETINE • 10 mg, 100 veg. tablets</td>
<td>18.00</td>
<td>13.50</td>
<td>10.50</td>
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<tr>
<td>00372</td>
<td>VITAMIN B3 Niacin • 500 mg, 100 caps</td>
<td>7.65</td>
<td>5.74</td>
<td>4.99</td>
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<tr>
<td>00098</td>
<td>VITAMIN B5 • 500 mg, 100 caps (Pantothenic Acid)</td>
<td>10.50</td>
<td>7.88</td>
<td>7.04</td>
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<tr>
<td>01535</td>
<td>VITAMIN B6 • 250 mg, 100 veg. caps</td>
<td>12.50</td>
<td>9.38</td>
<td>8.25</td>
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<tr>
<td>00361</td>
<td>VITAMIN B12 • 500 mcg, 100 lozenges</td>
<td>8.75</td>
<td>6.56</td>
<td>5.44</td>
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<tr>
<td>01634</td>
<td>VITAMIN C w/DIHYDROQUERCETIN • 1,000 mg, 60 veg. tablets</td>
<td>10.00</td>
<td>7.50</td>
<td>6.75</td>
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<tr>
<td>00927</td>
<td>VITAMIN C w/DIHYDROQUERCETIN • 1,000 mg, 250 veg. tablets</td>
<td>25.50</td>
<td>19.13</td>
<td>17.44</td>
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<tr>
<td>00084</td>
<td>VITAMIN C POWDER (BUFFERED) • 454 grams</td>
<td>23.95</td>
<td>17.96</td>
<td>16.50</td>
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<tr>
<td>01736</td>
<td>VITAMIN C-Magnesium Crystals (Effervescent) • 180 grams</td>
<td>20.00</td>
<td>15.00</td>
<td>13.50</td>
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</tr>
<tr>
<td>01732</td>
<td>VITAMIN D3 • 2,000 IU, 1 fl oz, Mint flavor</td>
<td>28.00</td>
<td>21.00</td>
<td>18.75</td>
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<tr>
<td>01753</td>
<td>VITAMIN D3 • 1,000 IU, 90 softgels</td>
<td>7.00</td>
<td>5.25</td>
<td>4.50</td>
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<tr>
<td>01751</td>
<td>VITAMIN D3 • 1,000 IU, 250 softgels</td>
<td>12.50</td>
<td>9.38</td>
<td>8.44</td>
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<tr>
<td>01713</td>
<td>VITAMIN D3 • 5,000 IU, 60 softgels</td>
<td>10.00</td>
<td>7.50</td>
<td>6.50</td>
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<tr>
<td>01718</td>
<td>VITAMIN D3 • 7,000 IU, 60 softgels</td>
<td>14.00</td>
<td>10.50</td>
<td>9.45</td>
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</tr>
<tr>
<td>01758</td>
<td>VITAMIN D3 W/SEA-IODINE™ • 5,000 IU, 60 caps</td>
<td>14.00</td>
<td>10.50</td>
<td>9.38</td>
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<tr>
<td>00864</td>
<td>VITAMIN D3 LIQUID EMULSION • 2,000 IU, 1 oz.</td>
<td>28.00</td>
<td>21.00</td>
<td>18.75</td>
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</tr>
<tr>
<td>01840</td>
<td>VITAMINS D AND K W/SEA-IODINE™ • 60 caps</td>
<td>24.00</td>
<td>18.00</td>
<td>16.50</td>
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</tr>
<tr>
<td>01763</td>
<td>VITAMIN E (Natural) • 400 IU, 100 softgels</td>
<td>30.00</td>
<td>22.50</td>
<td>21.00</td>
<td>19.50</td>
<td></td>
</tr>
<tr>
<td>01225</td>
<td>VITAMIN K2 (Low-dose) • 45 mcg, 90 softgels</td>
<td>18.00</td>
<td>13.50</td>
<td>12.00</td>
<td></td>
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</tr>
</tbody>
</table>

**W**

<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>
</tr>
</thead>
<tbody>
<tr>
<td>01902</td>
<td>WAIST-LINE CONTROL™ • 120 veg. caps</td>
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<td>X-R SHIELD • 90 veg. caps</td>
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<td>33880</td>
<td>OUTSTANDING HEALTH: THE 6 ESSENTIAL KEYS TO MAXIMIZE YOUR ENERGY AND WELL BEING by Michael Gaitzer, MD &amp; Larry Trivieri Jr. • 2015</td>
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**SUBTOTAL OF COLUMN 10**

**SUBTOTAL OF COLUMN 11**

**SUBTOTAL OF COLUMN 12**

* These products are not 25% off retail price.  
** Due to license restrictions, this product is not for sale to customers outside of the USA.  
*** Due to license restrictions, this product is not for sale to customers outside of the USA.  
† 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 Health Advisor toll-free at 1-800-226-2370
**ORDER SUBTOTALS**

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**ORDER TOTALS**

| SUBTOTAL OF COLUMNS 1 - 12 |  |

**POSTAGE & HANDLING** (Any size order, in the U.S. includes Alaska & Hawaii)

- $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.

**SHIPPING**

ALL OTHER INTERNATIONAL AIR WILL BE ADDED.

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

---

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

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**INTRODUCING YOUR HEALTHY REWARDS**

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Call toll-free 1-888-224-8239

www.LifeExtension.com/Rewards

* You earn LE Dollars on all your Life Extension purchases (except shipping fees, CHOICE and *Premier* program fees, *Life Extension* Magazine® subscriptions, or any purchases made with LE Dollars or gift card). Redeem LE Dollars for any purchase such as products, labs, sale items, and shipping fees at the rate of 1 LE Dollar being equal to $1 U.S Dollar at checkout. LE Dollars may not be redeemed for *Premier* program fees, CHOICE program fees, *Life Extension* Magazine® subscriptions, or to purchase Gift Cards. LE Dollars have no cash value and are not redeemable for cash, transferable, or assignable for any reason.

† CHOICE Standard pre-paid shipping offers unlimited shipping to any mailing address within the 50 U.S. states, excluding U.S. territories. CHOICE also gives you discounts on non-standard shipping, shipping outside of the United States, and expedited shipping costs. CHOICE pre-paid unlimited shipping excludes blood test products and gift cards. This offer is not available to international customers serviced by distributors of Life Extension products.

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**BILL TO ADDRESS**

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**SHIP TO ADDRESS**

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Prices subject to change without notice.  
Please notify Life Extension of any address change.
BROCCOMAX®
THE SULFORAPHANE GENERATOR™

SUPERIOR LIVER AND CELL PROTECTION*
PHASE 2 LIVER DETOXIFICATION*
HEALTHY CELL REPLICATION*

• Patented, Ultra Clean, Super Critical Process
• 30 mg of SGS (Sulforaphane Glucosinolate, aka Glucoraphanin) Per Capsule
• Myrosinase Enzyme Activated
• DRcaps® Release in Small Intestine to Ensure the Conversion of SGS to Sulforaphane (and Not Sulforaphane Nitrile)
• Minimum 8 mg Sulforaphane Potential Per Capsule (in vitro test)

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

BroccoMax® Item # 26576
Retail Price $26.95
Your Price $20.21

VISIT US AT WWW.JARROW.COM FOR MORE PRODUCT INFORMATION

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Fortify Your Immune System with AHCC®

A Clinically Proven and Patented Medicinal Mushroom Extract

Every year, 23 million days of work are lost to feeling under the weather. While most people view immune challenges as part and parcel of the cold weather season, they are not, in fact, inevitable. After all, many people manage to stay well all year round, even though they are exposed to the same environments as those who have weaker resistance. The reason is because the environment is not responsible for whether you feel well or not. Your immune system is.

Innate Versus Adaptive Immunity

You have two basic types of immunity: innate and adaptive. Your innate immunity launches an immediate, general attack against a threat. Your adaptive immunity takes longer to kick in, but produces a targeted, specific response to a threat. Very few natural compounds have the ability to augment both innate and adaptive immunity. AHCC® (short for Active Hexose Correlated Compound) is one exception.*

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

How AHCC® Works

AHCC® is a patented, fermented, medicinal mushroom extract whose efficacy is supported by over 20 human clinical research studies. It has been shown to modulate immune response in several ways.

- AHCC® enhances the production of cytokines, the messengers of the immune system, so that your whole immune team can coordinate an organized response to outside threats.*
- AHCC® boosts populations of macrophages, the “street cleaners” of your immune system, which pick up foreign substances and cellular debris.*
- AHCC® increases the activity of natural killer (NK) cells, your innate immune system’s first line of defense against invasion.*
- And AHCC® raises levels of dendritic cells and T cells, key players in your adaptive immune system’s highly specialized response to specific threats.*

Item# 29727
Retail
$74.95
30% OFF
Your Price
$52.47

Kinoko® Gold AHCC

Significantly improves immune response, maintains peak natural killer cell activity supported by over 20 human studies!

Quality of Life is proud to have taken the Natural Products Foundation Truth in Advertising Pledge, a formal commitment to disseminating only truthful, non-misleading, and substantiated information.

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We have always been about Results.

Master Supplements is dedicated to providing you with digestive health products that you can feel working.

Our probiotics, enzymes and fiber supplements all help restore and maintain digestive comfort and regularity. A healthy gut means your microflora are in balance, which helps support digestive and immune health. If you try our products and are not satisfied, we offer a 100% money back guarantee. Visit trustpilot.com to see what other consumers are saying about Master Supplements Inc.

WHAT SETS US APART?

- **VALUE**: Two probiotic capsules per week benefit the microbiome.
- **TECHNOLOGY**: Sixteen U.S. Patents ensure effectiveness.
- **QUALITY**: Online test results for every bottle.
- **RESULTS**: Fast-acting digestive relief.

Call your Life Extension® advisor 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.*
Folate helps maintain homocysteine levels within the normal range, thereby promoting cardiovascular health. Folate also supports neurotransmitter synthesis—which in turn helps maintain cognitive abilities.

However, not everyone has sufficient activity of the enzyme required to convert folate to its biologically active form, 5-methyltetrahydrofolate, or 5-MTHF.

For those whose homocysteine levels remain stubbornly high, the answer lies with the bioactive form of folate called 5-MTHF, which is up to 7 times more bioavailable than ordinary folic acid. This unique compound requires no enzymatic conversion to become metabolically active—providing maximum support for both cardiovascular and cognitive health.

Optimized Folate provides metabolically active 5-MTHF folate in 1,000 mcg or 5,000 mcg strengths.

The demand for 5-MTHF has surged as more consumers have discovered its potent homocysteine-lowering effects.

Non-GMO Quatrefolic® is a registered trademark of Gnosis, S.p.A. Patent number 7,947,662.

References
SUPPORT ARTERIAL HEALTH

With The Most Complete Vitamin K Formula

If vitamin K levels are less than ideal, the matrix Gla-protein that lines the vascular system allows calcium to infiltrate soft tissues, similar to the way calcium is absorbed into bone. Optimal vitamin K levels function like a control switch—and keep calcium out of the arteries.¹

There are three forms of vitamin K that are key factors to promoting arterial health:²

- Vitamin K1
- Vitamin K2 (MK-4) (rapidly absorbed)
- Vitamin K2 (MK-7) (long-acting)

K1 is the kind of vitamin K found in green vegetables, but only a fraction is absorbed in the bloodstream. Supplementing ensures optimal K1 blood levels within normal range.

K2 is found in meat, dairy, and egg yolks. MK-4 is the most rapidly absorbed kind of K2, while MK-7 boasts a long half-life. This makes the two together the perfect complement to any vitamin K regimen.³

Life Extension® Super K with Advanced K2 Complex is the world’s most comprehensive vitamin K formulation. Take with meals that contain some fat for optimal absorption.

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<tr>
<th>Retail Price</th>
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<tr>
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<td>4 bottles</td>
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Each bottle lasts for three months.

Non-GMO

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.

References

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.

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

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
7  EXPOSING THE GENERIC DRUG PRICE SCANDAL
The public is waking up to a price-gouging scandal that Life Extension® sought to prevent decades ago. Learn the magnitude by which our pockets are being plundered and how to slash generic drug prices by 90%.

38  CURCUMIN COUNTERS BRAIN AGING AND CANCER
Curcumin can favorably affect the deadly mechanisms involved in both cancer and Alzheimer’s while also boosting the production of new neurons.

61  L-THEANINE’S BRAIN BENEFITS
L-theanine, an amino acid found in green tea, is known to induce calm, tranquil effects while improving alertness. New studies show it may reduce the risk of stroke and protect against brain damage if a stroke occurs.

28  REDUCE DEPRESSION AND ANXIETY WITHOUT DRUGS
Anti-anxiety drugs carry huge risks. Human trials demonstrate that a special probiotic combo shows a remarkable 50% decrease in depression scores and 55% improvement in anxiety scores.

50  LOWER URIC ACID LEVELS TO PREVENT GOUT
Gout is a form of arthritis characterized by high levels of uric acid. A tannin-rich tree extract safely lowers uric acid (average of 27%), reducing the necessity for drugs.

68  FDA APPROVES FIRST ANTI-AGING STUDY ON METFORMIN
Metformin is now believed to mimic the longevity benefits of calorie restriction. The FDA has approved a human clinical trial that may prove metformin induces healthier aging and longer life spans.