



LIFE
EXTENSION[®]

The Science of a Healthier Life[®]

LifeExtension.com

January 2022

FEATURE ARTICLES

7 Soaring Deaths from Opioid Drugs

24 Risks of Sitting Too Long

35 Improve Your Hearing

40 Protect Against Memory Loss

50 Safe Relief from Acute Pain

60 Probiotic Lowers LDL Cholesterol

70 Reduce Migraine Frequency/Severity

Safe Relief from **ACUTE PAIN**



PLUS: PAGE 79

**Harvard Scientist
Describes
The Mindspan Diet**





Life Extension

SuperSale

The annual **SUPER SALE** enables **premium** nutrient formulas to be obtained at the year's lowest prices.

Long-term supporters know that the **quality** of the products is backed by **Life Extension's** commitment to extended healthy lifespans.

Below are examples of **SUPER SALE** savings:



SUPER SALE
Four-Unit Per-Bottle Price

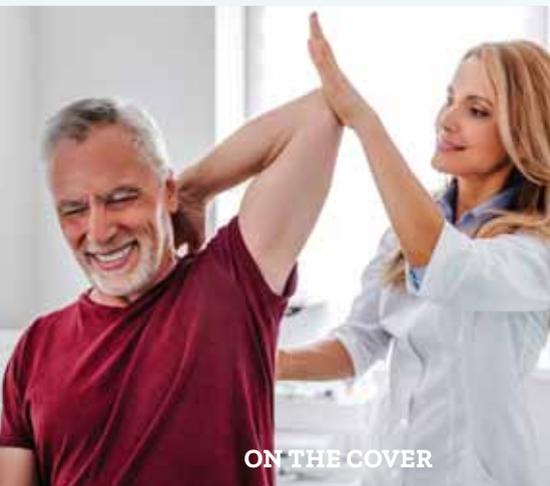
Vitamin D3 125 mcg (5,000 IU), 60 softgels • Item #01713 High-potency vitamin D in a softgel for better absorption.	\$5.85
N-Acetyl-Cysteine 600 mg, 60 capsules • Item #01534 Supports healthy respiratory tract and immune function.	\$8.33
Super K 90 softgels • Item #02334 (3-month supply) Supports bone and heart health with 3 forms of vitamin K including MK4 and MK7 .	\$18.23
BioActive Complete B-Complex 60 vegetarian capsules • Item #01945 Enzymatically active forms of B vitamins .	\$7.20
Zinc Caps 90 vegetarian capsules • Item #01813 Zinc monomethionine and zinc citrate provide 50 mg of absorbable zinc .	\$5.40
AMPK Metabolic Activator 30 vegetarian tablets • Item #02207 Plant compounds to support youthful AMPK activity. (1 tablet daily)	\$21.60
Vitamin C 24-Hour Liposomal 60 vegetarian capsules • Item #02501 Increases vitamin C in plasma 7-times more than regular vitamin C . Sustained support 24 hours a day . (2-month supply)	\$20.70
Senolytic Activator 36 vegetarian capsules • Item #02301 (3-month supply) Targets senescent cells with theaflavins, quercetin and bio-available fisetin .	\$16.20
Super Omega-3 Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin 120 softgels • Item #01988 Highly purified EPA and DHA plus sesame lignans, krill and astaxanthin.	\$28.35
FLORASSIST® GI with Phage Technology 30 liquid capsules • Item #02125 Dual-encapsulation probiotic for optimal delivery to help balance intestinal bacteria.	\$20.25
Curcumin Elite 500 mg, 60 vegetarian capsules • Item #02407 Patented turmeric extract provides 45 times greater bioavailability. (1 capsule daily)	\$19.80

SUPER SALE ENDS JANUARY 31, 2022.

Customers traditionally take advantage of the **SUPER SALE** to stock up on a year's supply of their favorite supplements. To place your order, call 1-800-544-4440 or visit www.LifeExtension.com (**SUPER SALE** pricing available only to customers in the US, Canada, and England.)

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.

REPORTS



ON THE COVER

**50 SAFE RELIEF
FROM ACUTE PAIN**

A **2020** human study shows a **plant extract** combination relieved **musculoskeletal pain** as quickly as **acetaminophen**.

24 RISKS OF SITTING TOO LONG

Americans spend more than **half** their waking time **sitting**, which can lead to **deep vein thrombosis**. Clinical studies have shown **two plant extracts** reduce leg swelling and prevent venous clots.

35 VINPOCETINE IMPROVES HEARING CAPACITY

A **2021** clinical study found that a brain-boosting compound called **vinpocetine** also improved **hearing** capacity.

40 NUTRIENTS THAT PROTECT AGAINST MEMORY LOSS

Two nutrients have been **clinically shown** to *improve* memory function and stabilize or reverse cognitive dysfunction in people.

60 PROBIOTIC THAT LOWERS CHOLESTEROL

A **probiotic** strain helps decrease cholesterol absorption. In a clinical trial, this probiotic *reduced* LDL and total cholesterol blood levels.

70 MAGNESIUM MITIGATES MIGRAINES

Magnesium helps prevent migraines and lessens their duration and severity. Two human studies published in **2021** corroborate these benefits. Previous findings show magnesium is *more effective* when combined with **riboflavin** and **CoQ10**.

DEPARTMENTS

**7 SOARING DEATHS FROM
PAIN-RELIEVING DRUGS**

FDA-approved **analgesics** inflict long-term injury to kidneys and other vital organs. Unprecedented numbers of Americans perish from acute **opioid** overdoses.

17 IN THE NEWS

Whey improves microvascular circulation in heart failure patients; higher magnesium linked to reduced liver cancer risk; time-restricted eating may help prevent chronic metabolic diseases; B vitamins lower cardiovascular-related mortality risk.

79 AUTHOR INTERVIEW:

Director of Gerontology at Harvard and author of ***The Mindspan Diet***, Dr. Preston Estep explains the secrets of populations that live the longest with low levels of dementia.

87 WELLNESS PROFILE

After walking away from the Baskin-Robbins fortune, John Robbins founded an organization to transform food systems to support healthy people and a healthy planet.

91 SUPER FOODS

The herb fennel is rich in polyphenols and other compounds that show anti-inflammatory, anti-mutagenic, anti-thrombotic, hypoglycemic, and stress-relieving properties.





**CONNECT
with**

Life Extension Online!

find us on **facebook** follow us on **twitter**

Facebook.com/LifeExtension Twitter.com/LifeExtension

Customer care is available to take your calls
24 hours a day, 7 days a week: 1-800-544-4440

Visit the Life Extension® Nutrition Center Store

- The Most Complete Line of Life Extension Supplements
- Blood Testing and Analysis
- Personal Consultation with Life Extension Product/Wellness Specialist



NEW LOCATION

**Nutrition Center of Florida, Inc., 900 North Federal Highway,
Fort Lauderdale, FL 33304 • Phone: 954-766-8144**

Hours: Monday-Friday 9 am-8 pm, Saturday 9 am-6 pm, Sunday 11 am-5 pm



#1 Rated
Catalog/Internet Merchant
6 Time Winner!*

* Ratings based on results of the 2021
ConsumerLab.com survey of supplement users.
More information at www.ConsumerLab.com/survey.

Editorial

Editor-in-Chief • Philip Smith
Executive Managing Editor • Renee Vermeulen
Medical Editor • Hernando Latorre, MD, MSC
Senior Editor • Dan Jewel
Senior Staff Writer • Michael Downey
Department Editor • Laurie Mathena
Associate Editor • Rivka Rosenberger, EdD
Creative Director • Robert Vergara
Art Director • Alexandra Maldonado

Chief Medical Officer

Steven Joyal, MD

Chief Scientific Officer

Andrew Swick, MS, PhD

Scientific Advisory Board

Richard Black, DO • John Boik, PhD • Aubrey de Grey, PhD
Deborah F. Harding, MD • Steven B. Harris, MD • Sandra C. Kaufmann, MD
Peter H. Langsjoen, MD, FACC • Dipnarine Maharaj, MD
L. Ray Matthews, MD, FACS • Ralph W. Moss, PhD
Michael D. Ozner, MD, FACC • Jonathan V. Wright, MD • Xiaoxi Wei, PhD

Contributors

Michael Downey • Preston Estep, III, PhD • Chancellor Faloon
Mike Jensen • Laurie Mathena • Marsha McCulloch, MS, RD

Advertising

Vice President of Marketing • Rey Searles • rsearles@lifeextension.com
National Advertising Manager • JT Hroncich • 404-347-4170

Senior Director of Sales and Business Development

Carolyn Bouchard • cbouchard@lifeextension.com • 954-202-7685

Circulation & Distribution

Life Extension • 3600 West Commercial Blvd., Ft. Lauderdale, FL 33309
Editorial offices: 954-766-8433 • fax: 954-491-5306

Customer Service: 800-678-8989 • Email: customerservice@LifeExtension.com

Wellness specialists: 800-226-2370 • Email: wellness@LifeExtension.com

Life Extension® Magazine values your opinion and welcomes 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

LIFE EXTENSION (ISSN 1524-198X) Vol. 28, No. 1 ©2022 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: \$40 per year in the United States. US \$47 in Canada. US \$60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark 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. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA-approved, qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. *Life Extension® Magazine* does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in it, except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.



TAP THE POWER OF N-ACETYL-L-CYSTEINE

TO SUPPORT IMMUNE FUNCTION

N-Acetyl-L-Cysteine (NAC) has been shown to support a healthy immune response and respiratory function.

NAC supports healthy levels of *glutathione* that helps promote a **healthy inflammatory** response and protect cells from oxidative stress.

For full product description and to order **N-ACETYL-L-CYSTEINE**, call **1-800-544-4440** or visit www.LifeExtension.com

CAUTION: Those who supplement with NAC should drink 6 to 8 glasses of water daily in order to prevent cysteine renal stones. Cysteine renal stones are rare but do occur.

SUPER SALE PRICE
Item #01534 • 60 capsules
1 bottle **\$9.45**
4 bottles \$8.33 each



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.

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. Bezzek, 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 U.S. patents for a multivitamin/mineral supplement, an Alzheimer's/dementia compilation, and a diabetic regimen.

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

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

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

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

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.

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 Benemerita 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 Dermatology of Hollywood, FL, and COSMESIS Skin Care.

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

Garry F. Gordon, MD, DO, is a Payson, Arizona-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, FL.

Professor Francesco Marotta, MD, PhD, of Montepulciano Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy and honorary resident professor, Nutrition, Texas Women's University. He is the author of more than 130 papers and 400 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 a pioneer in functional and anti-aging medicine in Italy where he also works as a journalist and a writer.

Lambert Titus K. Parker, MD, an internist and a board-certified anti-aging physician, practices integrative medicine from a human ecology perspective with emphasis on personalized brain health, biomarkers, genomics and total health optimization. He serves as the Medical Director of Integrative Longevity Institute of Virginia, a 501(c)3 Non-Profit Medical Research Institute. He also collaborates on education and research for Hampton Roads Hyperbaric Therapy.

Ross Pelton, RPh, PhD, CCN, is scientific director for Essential Formulas, Inc.

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

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

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

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

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

Roman Rozencaiw, 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 skull base surgery and wellness for the Adventist Health System in Celebration, FL.

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



Sandra C. Kaufmann, MD, is a fellowship-trained and board-certified pediatric anesthesiologist as well as the Chief of Anesthesia at the Joe DiMaggio Children's Hospital in Hollywood, Florida. She is the founder of The Kaufmann Anti-Aging Institute and the author of the book *The Kaufmann Protocol: Why we Age and How to Stop it* (2018). Her expertise is in the practical application of anti-aging research.



Richard Black, DO, is a dedicated nuclear medicine physician practicing as an independent contractor out of Cleveland, Ohio. Dr. Black is board certified in internal medicine and nuclear medicine, and is licensed to practice medicine in multiple states throughout the United States.



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 earned his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University's Department of Statistics.



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.



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 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, is the Medical Director of the Maharaj Institute of Immune Regenerative Medicine, 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.



L. Ray Matthews, MD, FACS, is a professor of surgery and director of Surgical Critical Care at Morehouse School of Medicine in Atlanta, GA, and a trauma and critical care surgeon at Grady Memorial Hospital. He has published widely and is known as one of the top vitamin D experts. Dr. Matthews has spoken before the U.S. Food and Drug Administration several times, presenting a recent update about clinical research on vitamin D.



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 more than 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 X-Therma 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.

Feel like a Kid Again



If you experience general fatigue, it may be due to the decline of NAD⁺, an important coenzyme found in every cell.

NAD⁺ facilitates the production of ATP, which your body uses for fuel.

NAD⁺ Cell Regenerator™ formulas help maintain *youthful* levels of NAD⁺.

NAD⁺ Cell Regenerator™ and Resveratrol

Nicotinamide riboside (300 mg), *trans*-resveratrol and other cell-energizing nutrients in one capsule.

Item #02348 • 30 veg. caps.

*

NAD⁺ Cell Regenerator™

300 mg of nicotinamide riboside per capsule.

Item #02344 • 30 veg. caps.



* For Super Sale pricing available to readers of this magazine, call 1-800-544-4440 or visit LifeExtension.com/NAD



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

For full product description and to order **NAD⁺ Cell Regenerator™** or **NAD⁺ Cell Regenerator™ with Resveratrol**, 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.

Soaring Deaths From Pain-Relieving Drugs



WILLIAM FALOON



The leading cause of acute **liver failure** in the United States is **acetaminophen** toxicity.¹

Each year, this popular drug is responsible for thousands of emergency room visits and hundreds of **deaths** in the United States.

It took decades for groups like **Life Extension** to force the **FDA** to mandate a **warning** on the label of **acetaminophen** drugs about **liver toxicity**.

Regular use of acetaminophen is associated with increased risk of **kidney damage**, **kidney cancer**, and **dementia**, yet nothing on the label warns of these dangers.²⁻⁴

Ibuprofen is another over-the-counter drug that pain sufferers often take daily. Regular use can inflict **stomach** and **kidney** injuries.⁵

In 1995, **OxyContin®** was approved for routine pain relief. Makers of this drug recognized the potential to cause addiction and the resistance they would face from doctors.⁶

The company developed a **fraudulent** marketing campaign designed to promote **OxyContin®** as a time-released drug that was *less prone to abuse*.⁶

Between 1999 and 2019, nearly **500,000** people died from an **overdose** involving natural and synthetic **opioids**.⁷

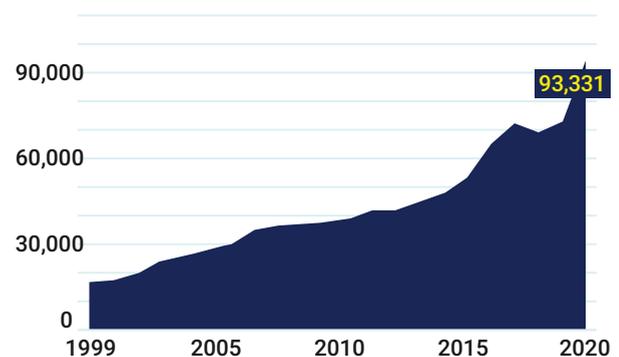
CDC data show that drug-related overdose deaths in **2020** hit a record high of **93,331** Americans.^{8,9}

As you can see by the chart on this page, overdose deaths have surged *higher* since widespread prescribing of **opioid drugs** began around **1999**.

Poisonings inflicted by **non-opioid** pain drugs continue to disable and kill.

This editorial describes an alternative that has been shown to work as well as **acetaminophen** for acute **pain**, without the **side effects**.

Number of drug overdose deaths in the U.S. from 1999 to 2020*



* Historical data from 1999 to 2020.
Source: Centers for Disease Control and Prevention

Relief from acute and chronic pain is a major medical challenge.

Powerful nonsteroidal anti-inflammatory drugs (NSAIDs) were introduced in the **1960s-1970s**. Their effectiveness was impeded by increased risk of **peptic ulcers** that resulted in thousands of deaths a year from acute **gastrointestinal hemorrhage**.

In the late **1990s**, more selective anti-inflammatory drugs like **Vioxx®** were approved that mitigated stomach damage but doubled the risk of **heart attack** and **stroke**.¹⁰

Merck® withdrew **Vioxx®** in **2004** and later paid **\$4.85 billion** to settle litigation for hiding the **cardiovascular risks** of this purportedly safer pain reliever.^{11,12}

Most side effects caused by **Vioxx®** were associated with longer-term duration of usage and escalating dosages.

Non-Prescription Pain Killers

Over-the-counter drugs like **ibuprofen** and **acetaminophen** are widely used for acute and chronic pain relief.

While short-term moderate-dose use is safe, those who frequently take acetaminophen or NSAIDs face potential risks to their liver, kidneys, and other organs.^{13,14}

If **acetaminophen** is combined with heavy alcohol ingestion, there is a *higher* risk of acute **liver failure**.^{15,16}

Acetaminophen produces a toxic byproduct that depletes the liver of **glutathione**, which disables the liver's ability to detoxify alcohol. This can lead to acute **liver failure**.¹⁷



Combining acetaminophen with alcohol to relieve a hangover can damage your liver.^{18,19}

In the 1980s, one of our medical advisors suggested that we make a product that combined **acetaminophen** with **N-Acetyl-L-Cysteine (NAC)** to protect against **glutathione depletion**.

The challenge is the **FDA** requires expensive clinical trials when combining a **drug** with a **nutrient**.

There is no **acetaminophen + N-Acetyl-L-Cysteine** combination available today. Those who rely on acetaminophen may choose to take a **600 mg** capsule of **NAC** with each acetaminophen dose.

Our Position on Routine Pain Relief

Acetaminophen, opioids, and some other analgesic drugs work in the central nervous system to dull the sense of **pain**.²⁰

We at **Life Extension** have advocated for decades that it is more efficient to neutralize underlying causes. This includes **pain** resulting from joint **cartilage degeneration** or inflammation-induced **musculoskeletal** pain.

Reliance on drugs that block pain signals to the brain can enable the degenerative causes to worsen, leading many to increase their daily use of toxic pain relievers.

Many people find long-term relief using nutrients such as **glucosamine**, **gamma linolenic acid (GLA)** and/or **omega-3s**.

For those with acute discomfort, a novel **nutrient blend** has been shown to work as effectively as **acetaminophen** without the toxic side effects.

Excess Dietary Omega-6 Fats Cause Painful Inflammation

The American diet is loaded with **omega-6 fats** that are contributors to chronic **inflammatory** reactions.

Processed foods often contain fats high in omega-6s, like safflower, cottonseed, soybean, and corn oils.

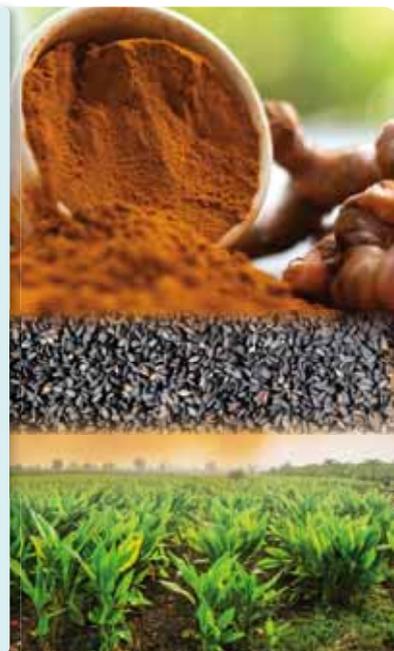
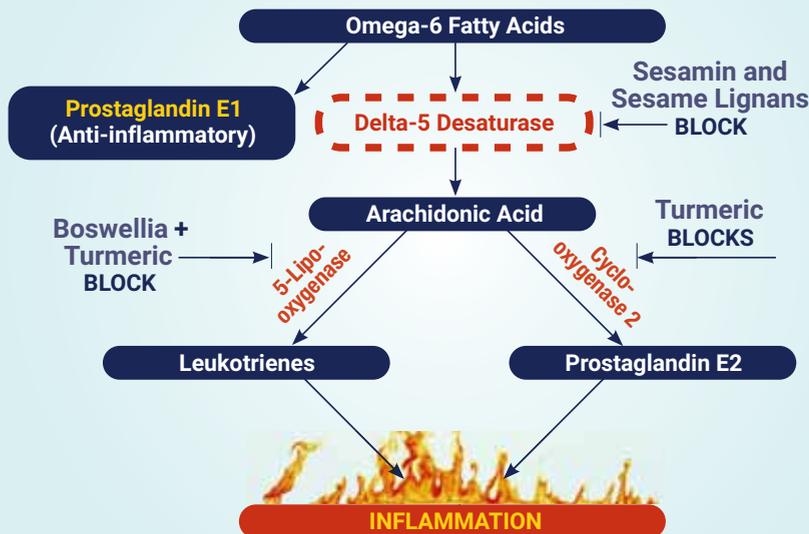
When one ingests an **omega-6** fat, there are two major pathways it follows in the body.

As shown on the chart on the next page, a common pathway is for an *enzyme* called **delta-5-desaturase** to convert **omega-6s** into pain-inducing **prostaglandin E2** and **leukotrienes**.

The desired pathway for **omega-6 fats** is for enough of them to convert to an **anti-inflammatory** compound called **prostaglandin E1**.



How Plant Extracts Reduce Inflammation



A preclinical study showed that the **sesame oil** component known as **sesamin** inhibits the **delta-5-desaturase** enzyme,²¹ thus shunting more **omega-6** fats away from **pro-inflammatory** pathways to **anti-inflammatory** prostaglandin E1.

Boswellia and **turmeric extracts** provide additional protection against omega-6 fats converting into **leukotrienes** and **prostaglandin E2**.²²

Contrast the beneficial mechanisms of **nutrients** to **acetaminophen** that blocks pain signals to the brain, or COX-2 inhibitors like **Celebrex®** that impede only part of the pro-inflammatory omega-6 breakdown pathway.

Clinical Trial Compares Nutrients to Acetaminophen

To assess the efficacy of **nutrients** compared to **acetaminophen**, a clinical trial was conducted.

Half the people received **1,000 mg** daily of **acetaminophen** while the other half received **1,000 mg** daily of **black sesame oil** plus **turmeric** and **Boswellia extracts**.²²

The blend of these extracts relieved pain as *quickly and effectively as acetaminophen*.²²

Pain is more than just a *physical* experience. It also causes **emotional strain**.²³

The **nutrient blend** was **8.57 times better** than **acetaminophen** at relieving the **emotional** distress and unpleasantness of acute pain.²²

This makes sense, as the **nutrients** combat underlying causes of **musculoskeletal pain** whereas **acetaminophen** works by blocking **pain signals** to the brain.

When assessing total **pain relief** endpoints in this study, the results showed the **nutrient blend** worked as well as **acetaminophen**.

Fast- versus Slow-Acting Nutrients

Nutrients like **glucosamine** and **omega-3s** do not provide immediate relief.

In contrast, a blend of **black sesame oil** plus **turmeric** and **Boswellia extracts** was shown to reduce **pain scores** to a similar degree as **acetaminophen**, starting day one.

These data indicate a potential for acute-pain sufferers to find fast-acting relief, and an opportunity for chronic-pain sufferers to use this **nutrient blend** for an extended period, as there are no toxicity concerns.

Young Bodies Heal Fast

Children's injuries usually heal quickly.

Healing rates in older adults are so slow that there are those who suffer **immobility** caused by injuries and persistent inflammation.²⁴

Elderly individuals suffer **musculoskeletal pain** caused by degenerative processes that can be exacerbated by past or current injuries.

Chronic reliance on pain-relieving **drugs** can lead to side effects.

A better solution is to restore older persons to more youthful functionality, to reverse frailty, and to extinguish inflammatory fires that typically accompany aging.

Those suffering from **musculoskeletal pain** may consider a proprietary blend of **black sesame oil-turmeric-Boswellia** and also:

- Reduce ingestion of dietary **omega-6** fats,
- Consume more **omega-3s**, and
- Reduce all forms of **sugar** intake.

In this month's issue...

The article on page 50 of this month's issue describes the research demonstrating **pain relief** in response to a combination of **black sesame oil, turmeric** and **Boswellia**.

Page 35 discusses a **2021** study showing that **vinpocetine** (used to boost cognitive function) can also help reverse certain forms of **hearing loss**.

Migraine sufferers continue to benefit from **magnesium** and a study described on page 70 of this issue further corroborates this.

Anti-Aging Update

In **November 2020**, headline news stories around the world announced findings from a **hyperbaric oxygen** study that lengthened **telomeres** by **20%** in study subjects.²⁵ The media proclaimed **aging** had been reversed for the first time in **humans**.

To achieve these telomere elongation benefits, study subjects underwent **hyperbaric oxygen therapy** plus breathing in **pure oxygen** five days a week for three consecutive months.

Telomeres are tips at the end our chromosomes that shorten with each cell division. When there is no more telomere structure, cells die.

We've been informed that a study will soon be published showing **hyperbaric therapy** combined with healthy behavior patterns **elongated telomeres** an average of **40%** in older people!

We are carefully monitoring this research and interacting with the scientists to validate whether this **telomere elongation** is associated with indicators of systemic **age reversal**.

In the meantime, you can reduce your rate of **telomere shortening** by:²⁵

- Engaging in healthy lifestyles
- Doing high-intensity interval training
- Ensuring adequate antioxidant intake
- Consuming high amounts of omega-3s
- Including walnuts in your diet
- Restricting your calorie intake

Healthy choices you make today help protect against a wide range of degenerative disorders, including reducing inflammatory **pain** and maintaining longer **telomeres**.

Your support of **Life Extension** helps us fund **research** that aims to reestablish youthful structure and function in our aging bodies.

For longer life,



William Faloon, Co-Founder
Life Extension Buyers Club

Published in the Journal *Aging* on November 18, 2020

Hyperbaric oxygen therapy increases telomere length and decreases immunosenescence in isolated blood cells: a prospective trial

"Results: Telomeres length of T helper, T cytotoxic, natural killer and B cells increased significantly by over 20% following hyperbaric oxygen therapy (HBOT)... There was a significant decrease in the number of senescent T helpers by $-37.30\% \pm 33.04$ post-HBOT. T-cytotoxic senescent cell percentages decreased significantly by $-10.96\% \pm 12.59$ post-HBOT.

In conclusion, the study indicates that HBOT may induce significant senolytic effects including significantly increasing telomere length and clearance of senescent cells in the aging populations."

<https://www.aging-us.com/article/202188/text>

Origins of the Opioid Crisis

In 1995, the FDA approved a time-released opioid drug called **OxyContin®** that purportedly was less prone to addiction and abuse compared to other prescription opioids.

Aggressive promotion of OxyContin® along with the FDA's approval led to an epidemic of **opioid addictions** that continue to destroy the lives of millions of Americans.

Many endure the agonies of opioid withdrawal only to succumb to the powerful addicting properties and resume using **prescription opioids** or turn to street opioids like **heroin** and **fentanyl**.

The financial success of OxyContin® led about a dozen other pharma companies (including a subsidiary of **Johnson & Johnson**) to create their own **opioid brands** that were **approved** by the **FDA** and aggressively marketed to medical doctors and dentists.

The media blames opioid makers like **Purdue Pharma** for deliberately downplaying the addiction risk to doctors and illegally encouraging widespread prescribing.

While the actions of Purdue and other opioid makers are deplorable, I continue to argue that it was the FDA's **approval** of the **opioid drugs** that enabled the criminal behaviors of Big Pharma to occur.



Physicians' prescribing practices are largely based on whether the drug is approved by the FDA to treat a specific indication. In the case of extended-release opioid prescription drugs, the FDA approved them for **pain relief** and said they were less prone to addiction and abuse.²⁶

Hurried physicians trusted the FDA's approval process, even though it was later discovered that two FDA-employed doctors who pushed OxyContin® through the approval process went to work for Purdue Pharma soon after. (This is known as the **"revolving door"** that breeds corruption throughout Congress and governmental agencies.)

Had the FDA recognized that *any* **opioid** carries an addiction risk, this drug class would never have been approved for widespread use.

Even after addiction and overdose deaths became apparent, the **FDA** continued to approve other **opioid drugs** that were then inappropriately marketed to physicians for widespread use.



Authors of Hyperbaric Study Describe Other Methods Shown to Preserve Telomere Length

- High consumption of omega-3s
- Diet rich in walnuts
- Calorie restriction
- Healthy lifestyles
- High-intensity interval training
- Antioxidants

<https://www.aging-us.com/article/202188/text>



Novel Hyperbaric Oxygen Protocol Extends Telomere Length and Improves Immune Markers

- Some immune-cell telomeres elongated by over **20%**.
- Some senescent immune cells reduced by **37%**.
- Improved immune markers.

<https://www.aging-us.com/article/202188/text>

**First Hyperbaric Chamber Clinic
of its Type Opens in Central Florida**

**Aviv Clinic
The Villages, FL 32163**

[https://aviv-clinics.com/
hyperbaric-centers/villages-florida/](https://aviv-clinics.com/hyperbaric-centers/villages-florida/)

References

1. Available at: <https://www.mayoclinic.org/diseases-conditions/acute-liver-failure/symptoms-causes/syc-20352863>. Accessed October 13, 2021.
2. Kanchanasurakit S, Arsu A, Siriplabpla W, et al. Acetaminophen use and risk of renal impairment: A systematic review and meta-analysis. *Kidney Res Clin Pract.* 2020 Mar 31;39(1):81-92.
3. Choueiri TK, Je Y, Cho E. Analgesic use and the risk of kidney cancer: a meta-analysis of epidemiologic studies. *Int J Cancer.* 2014 Jan 15;134(2):384-96.
4. Jones GR. The Alzheimer pandemic: is paracetamol to blame? *Inflamm Allergy Drug Targets.* 2014 Feb;13(1):2-14.
5. Available at: <https://www.drugs.com/sfx/ibuprofen-side-effects.html>. Accessed October 14, 2021.
6. Available at: <https://www.nytimes.com/2007/05/10/business/11drug-web.html>. Accessed October 18, 2021.
7. Available at: <https://www.cdc.gov/opioids/data/analysis-resources.html>. Accessed October 18, 2021.
8. Available at: <https://www.commonwealthfund.org/blog/2021/drug-overdose-toll-2020-and-near-term-actions-addressing-it>. Accessed October 18, 2021.
9. Available at: <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>. Accessed October 18, 2021.
10. Available at: <https://www.reuters.com/article/us-stroke-vioxx-idUSTRE49C84M20081013>. Accessed October 14, 2021.
11. Wadman M. Merck settles Vioxx lawsuits for \$4.85 billion. *Nature.* 2007 2007/11/13.
12. Available at: <https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/vioxx-rofecoxib-questions-and-answers>. Accessed October 19, 2021.
13. Moore N, Scheiman JM. Gastrointestinal safety and tolerability of oral non-aspirin over-the-counter analgesics. *Postgrad Med.* 2018 Mar;130(2):188-99.
14. Keen MU, Aeddula NR. Analgesic Nephropathy. *StatPearls.* Treasure Island (FL)2021.
15. Available at: <https://www.raps.org/regulatory-focus/news-articles/2015/11/fda-amends-liver-warning-labeling-guidance-for-some-otc-drugs-containing-acetaminophen>. Accessed October 14, 2021.
16. Zimmerman HJ, Maddrey WC. Acetaminophen (paracetamol) hepatotoxicity with regular intake of alcohol: analysis of instances of therapeutic misadventure. *Hepatology.* 1995 Sep;22(3):767-73.
17. Available at: <https://www.sciencedaily.com/releases/2002/10/021014072451.htm>. Accessed October 14, 2021.
18. Available at: <https://www.medpagetoday.com/opinion/inotherwords/14895>. Accessed October 19, 2021.
19. Available at: <https://health.clevelandclinic.org/is-acetaminophen-safe-to-take-when-youre-drinking/>. Accessed October 19, 2021.
20. Sullivan D, Lyons M, Montgomery R, et al. Exploring Opioid-Sparing Multimodal Analgesia Options in Trauma: A Nursing Perspective. *J Trauma Nurs.* 2016 Nov/Dec;23(6):361-75.
21. Shimizu S, Akimoto K, Shinmen Y, et al. Sesamin is a potent and specific inhibitor of delta 5 desaturase in polyunsaturated fatty acid biosynthesis. *Lipids.* 1991 Jul;26(7):512-6.
22. Rudrappa GH, Chakravarthi PT, Benny IR. Efficacy of high-dissolution turmeric-sesame formulation for pain relief in adult subjects with acute musculoskeletal pain compared to acetaminophen: A randomized controlled study. *Medicine (Baltimore).* 2020 Jul 10;99(28):e20373.
23. Talbot K, Madden VJ, Jones SL, et al. The sensory and affective components of pain: are they differentially modifiable dimensions or inseparable aspects of a unitary experience? A systematic review. *Br J Anaesth.* 2019 Aug;123(2):e263-e72.
24. Morri M, Ambrosi E, Chiari P, et al. One-year mortality after hip fracture surgery and prognostic factors: a prospective cohort study. *Sci Rep.* 2019 Dec 10;9(1):18718.
25. Hachmo Y, Hadanny A, Abu Hamed R, et al. Hyperbaric oxygen therapy increases telomere length and decreases immunosenescence in isolated blood cells: a prospective trial. *Aging (Albany NY).* 2020 Nov 18;12(22):22445-56.
26. Available at: <https://www.nytimes.com/2018/05/29/health/purdue-opioids-oxycontin.html>. Accessed October 19, 2021.



Increase **AMPK** to Better Manage Body Weight

Most people today consume excess calories.

This results in **mTOR** constantly running at high gear, which is a factor in unwanted **fat storage**.

Studies show that increasing AMPK activity turns down excess **mTOR**.¹

Reduce Cell Fat Storage

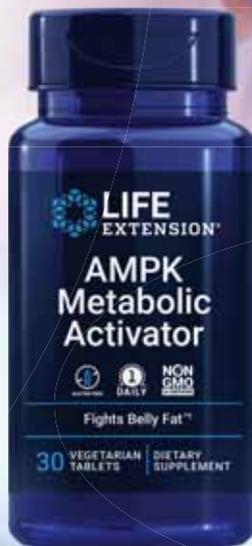
Scientific studies show that increasing AMPK activity can encourage cells to store less fat and burn it as energy.^{2,3}

AMPK Metabolic Activator was formulated based on data showing reduced belly fat in response to just one of its ingredients (*Gynostemma pentaphyllum*).³

This *Gynostemma pentaphyllum* + *hesperidin* formula is designed to support healthy **AMPK** cellular activation.

References

1. *Anticancer Agents Med Chem.* 2013 Sep;13(7):967-70.
2. *Nutr J.* 2016;15:6.
3. *Obesity (Silver Spring).* 2014;22(1):63-71.



SUPER SALE PRICE

Item #02207 • 30 vegetarian tablets

1 bottle **\$25.65** • 4 bottles \$21.60 each



For full product description and to order **AMPK Metabolic 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. Individual results are not guaranteed, and results may vary.

Actiponin® is a trademark of TG Biotech Co., Ltd.

B12

B12

B

SMART

Body & Brain

B12

B12

B12

BIOACTIVE FORMS OF VITAMIN B12

Only two **bioactive** coenzyme forms of vitamin B12 can be used directly by the body and brain.

The new **B12 Elite** provides both:

ADENOSYLCOBALAMIN

- Active in brain cell mitochondria.
- Preclinical evidence suggests that it may support already healthy levels of dopamine.
- Supports cellular energy production.

METHYLCOBALAMIN

- Supports cognition within brain cells.
- Promotes red blood cell production.
- Helps maintain healthy homocysteine levels.

Dissolve in the mouth or chew one vegetarian lozenge daily.



SUPER SALE PRICE

Item #02419 • 60 vegetarian lozenges

1 bottle \$7.43

4 bottles \$6.75 each



For full product description and to order **B12 Elite**, call 1-800-544-4440 or visit www.LifeExtension.com

FAST ACTING RELIEF

WORKS
ON DAY
ONE!



SUPER SALE PRICE

Item #02430 • 60 softgels

1 bottle \$21.60 • 4 bottles \$19.80 each



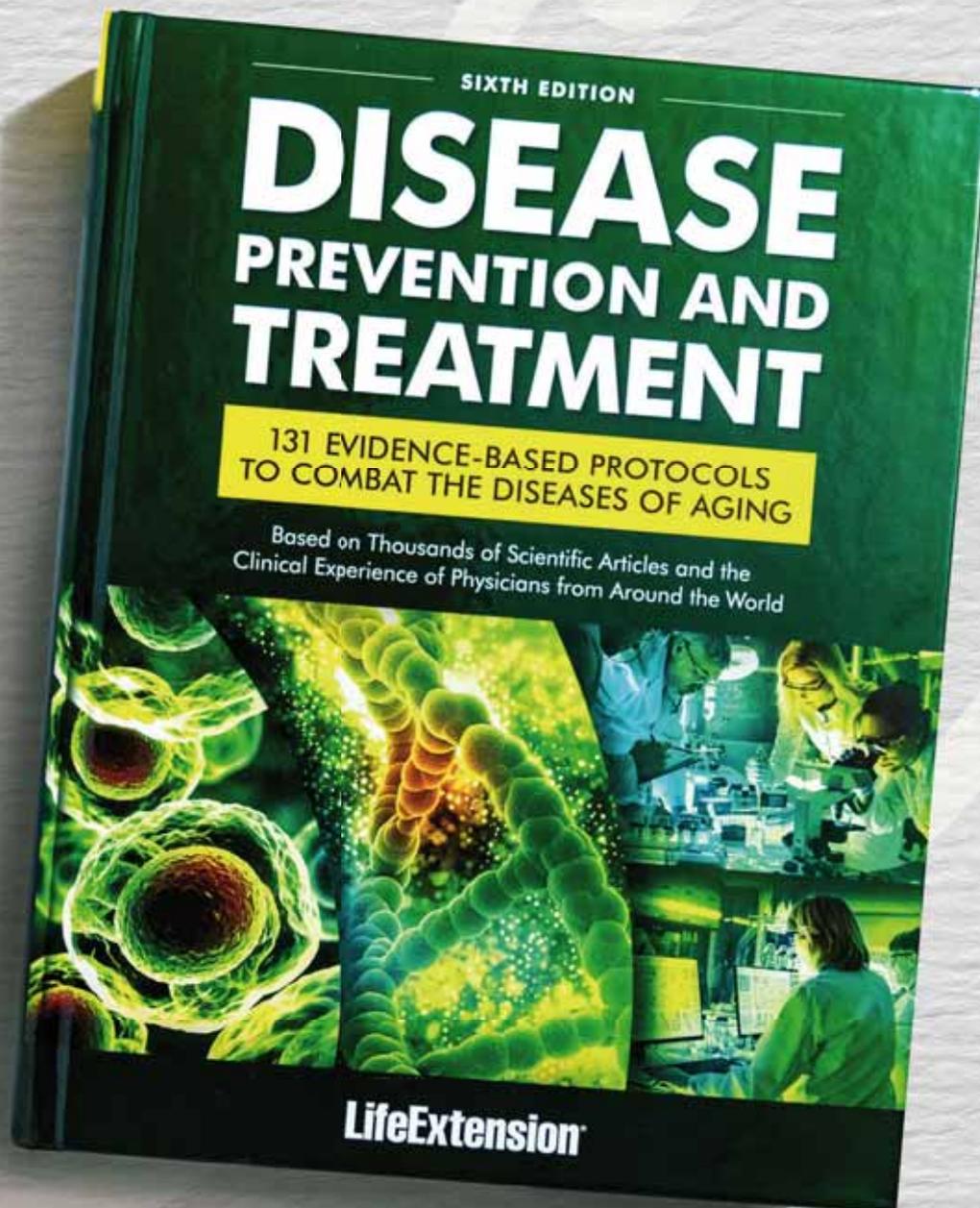
Clinically studied **plant extracts** can safely relieve occasional minor soreness of muscles and joints.*

Fast Acting Relief delivers a blend of three **plant extracts**—**turmeric**, ***Boswellia serrata***, and **black sesame seed**—which work together to promote a healthy inflammatory response and support comfortable joints.

For full product description and to order **Fast Acting Relief**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Rhuleave-K™ is a trademark of Arjuna Natural LLC. * *Medicine (Baltimore)*. 2020;99(28):e20373.

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.



An answer for what ails you,
whatever it is.

Stay healthier, longer.

Discover evidence-based protocols for over 130 conditions, including how to better manage cancer, cardiovascular disease, inflammatory and neurological disorders.

Disease Prevention and Treatment is a 1,500-page textbook that provides a wealth of novel solutions for challenging health issues.

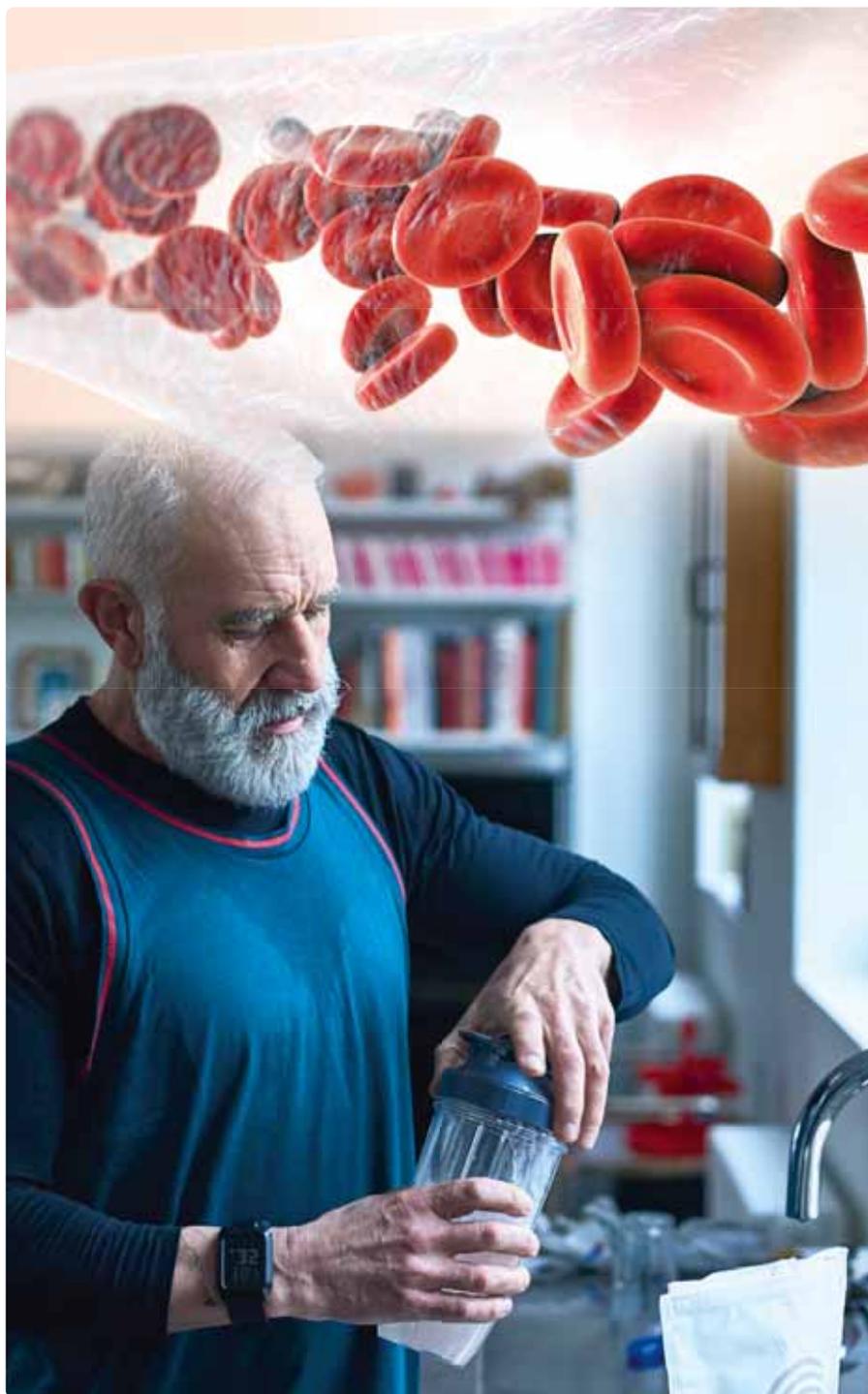
Disease Prevention and Treatment, 6th Edition | Item #DPT06

The ultimate medical reference
Price: \$59.95 | **SALE: \$30.00**

To order, call 1-866-542-9349 or visit
LifeExtension.com/BookSale

Use code **BOOKSALE** | Offer ends **December 27, 2021**

In the News



Whey Protein Improves Microvascular Function in Heart Failure Patients

Heart failure patients supplemented with whey protein showed improvement in systemic microvascular circulation, according to a report in the *Brazilian Journal of Medical and Biological Research*.*

A randomized, placebo-controlled trial included 25 participants, average age 66, who had New York Heart Association class I or II heart failure. Participants received whey protein or a placebo for 12 weeks.

“Our results suggested that dietary supplementation with whey protein improved microvascular endothelial function and possibly smooth muscle structure in patients with heart failure,” the authors concluded.

Editor’s Note: The endothelium is the lining of the body’s arteries, whose function may be impaired in cardiovascular diseases, thereby reducing the arteries’ ability to relax, which adversely affects circulation.

* *Braz J Med Biol Res.* 2021 Apr 19;54(6): e10577.

Greater Magnesium Intake Linked with Lower Liver Cancer Risk

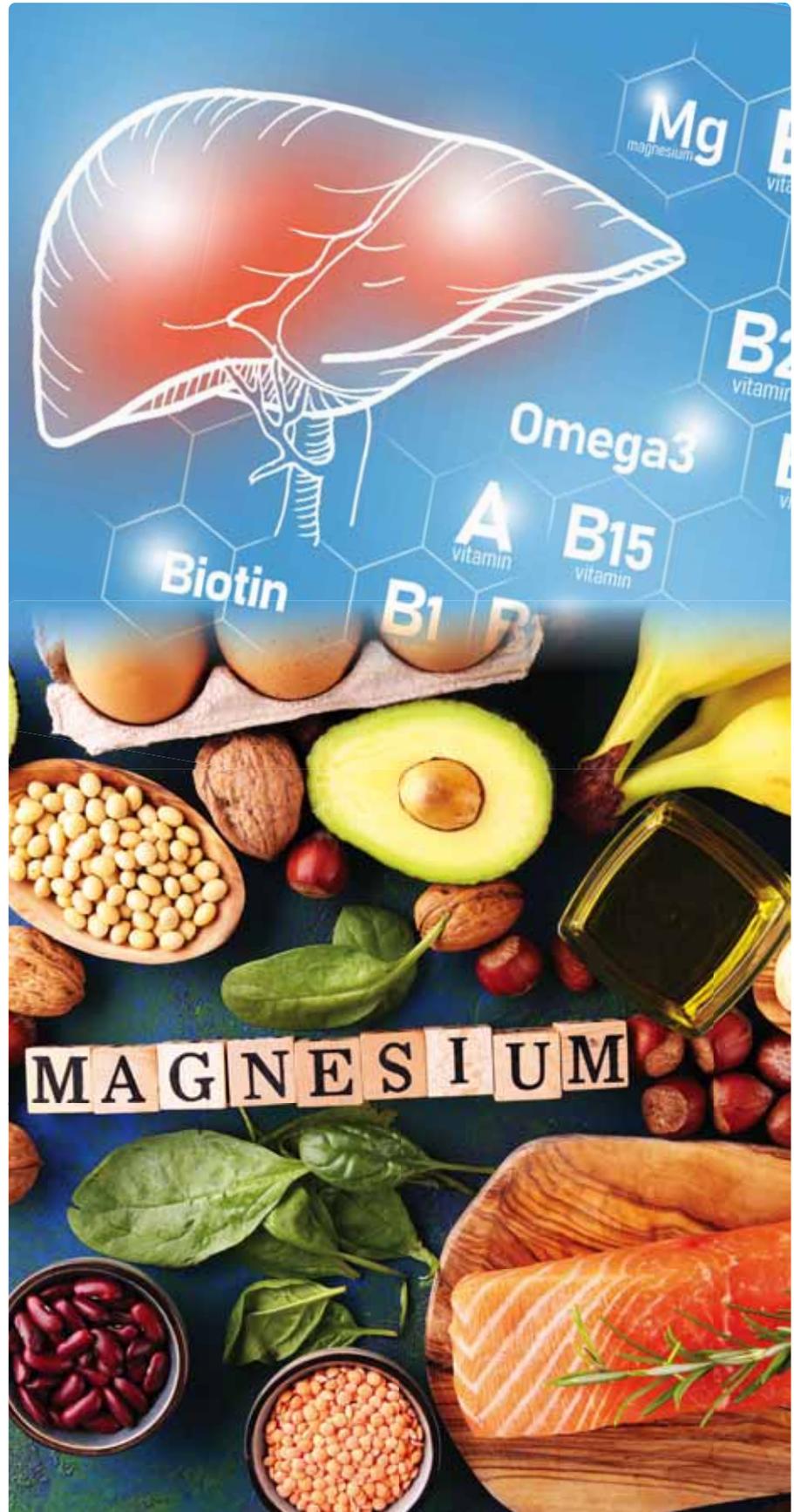
Increased intake of magnesium has a protective effect against the risk of developing liver cancer, an article published in *The American Journal of Clinical Nutrition* reported.*

Researchers at Vanderbilt University Medical Center examined data from 536,359 participants in the National Institutes of Health-American Association of Retired Persons (NIH-AARP) Diet and Health Study cohort. Food-frequency questionnaire responses during 1995 to 1996 were analyzed for total magnesium intake from supplements and food. The subjects were followed through 2011.

Among those whose total magnesium intake was among the top **25%** of participants, there was a **35%** lower adjusted risk of developing liver cancer in comparison with participants whose intake was among the lowest **25%**.

Editor's Note: During the time of the study, 1,067 cases of liver cancer were diagnosed among the participants.

* *Am J Clin Nutr.* 2021 Mar 11;113(3): 630-638.





Time-Restricted Eating May Help Prevent and Manage Chronic Metabolic Disease

A form of intermittent fasting called time-restricted eating may have a role in the prevention of chronic metabolic diseases, according to an article in *Endocrine Reviews*.*

Time-restricted eating is a technique in which all daily calories are consumed within a period of eight to 10 hours or less. Maintaining a long overnight fast is one way to conceptualize time-restricted eating. Long fasting periods have been associated with reduced chronic disease risk.

Research suggests that adopting a short window of feeding daily helps support healthy circadian rhythms. Circadian rhythms dictate the activity of genes, hormones, and metabolism at different times during a 24-hour day. Aligning when we eat with the body's internal clock optimizes health.

Editor's Note: "Intermittent fasting can improve sleep and a person's quality of life as well as reduce the risk of obesity, diabetes and heart disease," said senior author Dr. Satchidananda Panda.

* *Endocr Rev.* 2021 Sep 22;bnab027.

B Vitamins Benefit Stroke Patients

A meta-analysis of randomized, controlled trials revealed lower combined risk of stroke, heart attack and vascular death, as well as a reduction in homocysteine levels, in stroke patients who received supplements containing B vitamins, compared to a placebo.*

Researchers selected eight trials that included a total of 8,513 stroke patients. Trials were limited to those that evaluated homocysteine levels and recurrence of stroke, recurrence of cardiovascular disorders, and vascular death (separately or combined) among participants who received a placebo or vitamin B6, vitamin B12 and folate.

Analysis of the trials' results found a significant reduction in average homocysteine levels among B-vitamin-supplemented participants compared to those who received placebo. When the combined risks of heart attack, stroke and vascular death were examined, there was an **11%** lower risk among participants who received the vitamins compared to the placebo.

Editor's Note: Homocysteine is an amino acid formed in the body which, when elevated, is a risk factor for cardiovascular disease and numerous other conditions.

* *Cureus*. 2021 May 11;13(5):e14958.



BOOST YOUR FREE

TESTOSTERONE

Testosterone builds muscle, maintains sexual health, supports cardiac function, strengthens bones, and nourishes brain cells.^{1,2}

Testosterone Elite helps maintain healthy testosterone levels:†

- A clinical trial showed that **pomegranate** and **cacao** elevated **free testosterone** levels **48%** in just eight weeks.³
- **Luteolin** increases a protein for testosterone synthesis and inhibits aromatase, an enzyme that breaks down testosterone.⁴⁻⁶
- Just one capsule a day.

**PLANT-BASED
NUTRIENTS**

SUPER SALE PRICE

Item #02500 • 30 vegetarian capsules
1 bottle **\$37.80** • 4 bottles \$33.75 each



References

1. *Rev Urol.* 2004;6 Suppl 6(Suppl 6):S9-S15.
2. *Am J Med.* 2007 Oct;120(10):835-40.
3. Laila Nutraceutical Internal Study. Data on file. 2019.
4. *Cell Biol Toxicol.* 2020 Feb;36(1):31-49.
5. *J Pharmacol Exp Ther.* 2014 Nov;351(2):270-7.
6. *J Agric Food Chem.* 2012 Aug 29;60(34):8411-8.

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

† This product is intended to support testosterone levels but does not contain testosterone. Tesnor® is a trademark of Laila Nutra and Gencor.



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.



Healthy.

HOLIDAYS

SuperSale | Is On!

'Tis the season to save and stay well

It only happens once a year...every Life Extension supplement is on sale!

1-888-236-3992 | LifeExtension.com/Time2Save

Please use code **TIME2SAVE**

45 Times Greater Bioavailability Curcumin



Patented **turmeric** and **fenugreek blend** (500 mg) results in **45 times** greater bioavailability of free **curcuminoids**.

SUPER SALE PRICE

Item #02407

500 mg, 60 vegetarian capsules

1 bottle **\$21.60** • 4 bottles \$19.80 each

Same 500 mg potency of patented **turmeric** and **fenugreek blend** with added benefits of **ginger** and other **turmeric** actives.

SUPER SALE PRICE

Item #02324

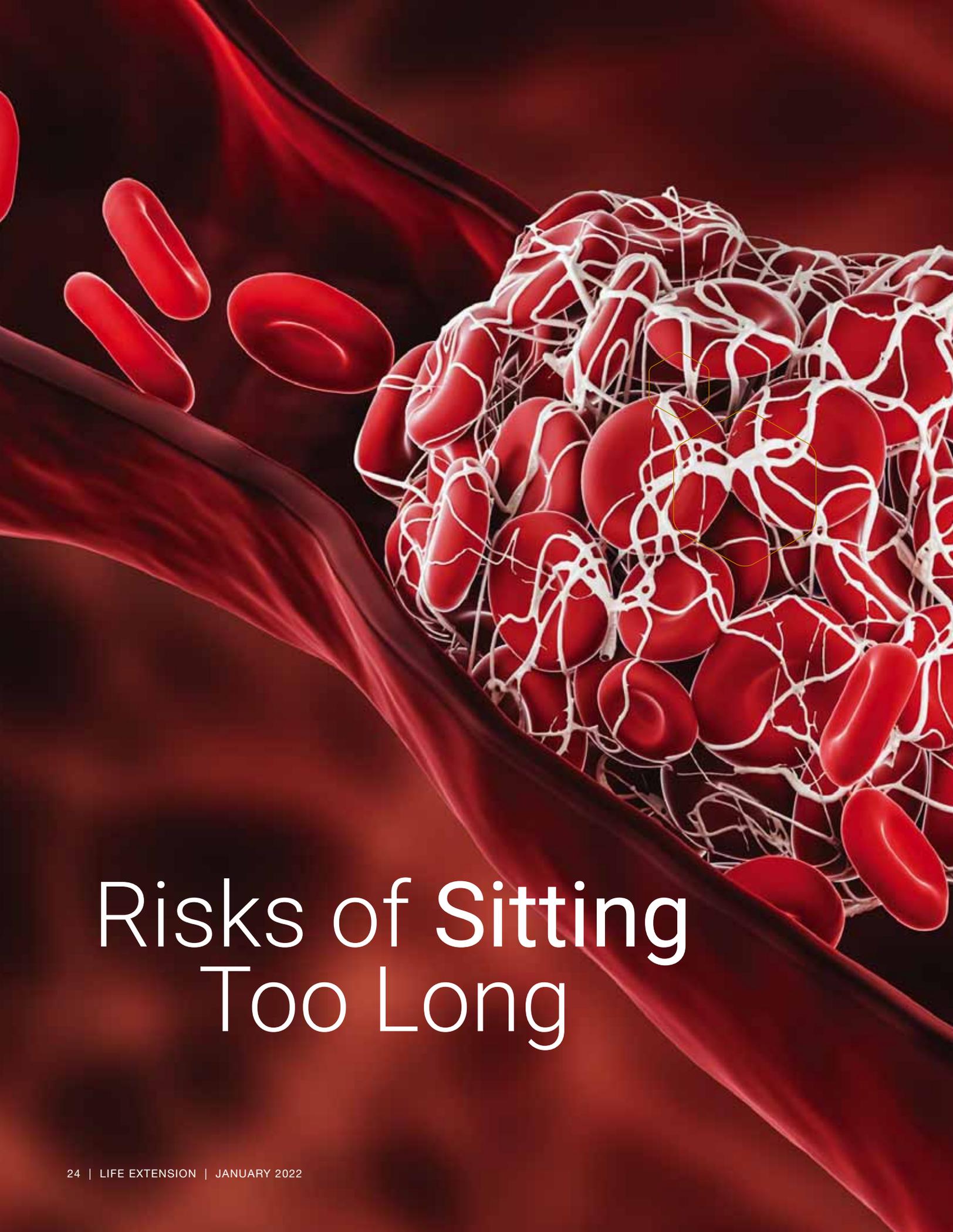
500 mg curcumin + gingerol, 30 softgels

1 bottle **\$18** • 4 bottles \$16.20 each



For full product description and to order Curcumin Elite™ or Advanced Curcumin Elite™, 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.



Risks of Sitting Too Long



BY MARSHA MCCULLOCH, MS, RD



According to a study that evaluated sedentary behaviors, Americans spend **more than half** their waking hours sitting, whether at work, commuting, or at home.¹

Any extended period of sitting increases the risk of **deep vein thrombosis**.²

These dangerous clots commonly develop in the legs,^{3,4} but can break loose and travel to the lungs. They cause as many as **300,000 deaths** in the U.S. annually.⁵

Scientists have identified two ingredients—the enzyme **nattokinase** and an extract of **French maritime pine bark**—that help prevent clotting and break down clots that start to form.⁶⁻⁹

A combination of these compounds has been proven in **clinical studies** to help prevent **venous clots** even in high-risk individuals.¹⁰

Sitting Too Long Can Be Deadly

Long, uninterrupted periods of sitting are a health hazard, even for those who exercise daily.¹¹

When we sit, our calf muscles aren't contracting to help propel spent blood in the veins back up to the heart.¹²

Prolonged sitting can **reduce blood flow** by up to two-thirds in the legs.¹³ When blood collects in the blood vessels of the legs, a **thrombus** (clot) is more likely to form.¹⁴

A clot that develops in the deep veins of the body is called **deep vein thrombosis** (DVT).³

If the clot breaks free and lodges in the arteries of the lungs, it can cause a **pulmonary embolism**, sometimes signaled by shortness of breath or chest pain. This urgent medical condition is **fatal** in up to **10%** of cases.^{4,15}

About **half** of individuals with deep vein thrombosis don't have warning symptoms,¹⁶ like leg swelling or pain. That doesn't mean they're not in danger.¹⁷

The Risk Factors

Deep vein thrombosis can be triggered by long hours traveling in cramped conditions, such as those found on **airplanes**.¹³ This increased risk is highest within the **two weeks** after a long flight.¹⁸

Deep vein thrombosis may also develop after hours spent sitting at the **computer**.¹⁹



Other risk factors include recent orthopedic surgery, limited mobility, acute infections, taking estrogen or contraceptive pills, diabetes, hypertension, elevated cholesterol and homocysteine, dehydration, smoking, obesity, and pregnancy.²⁰

Though anyone can be affected, the risk of deep vein thrombosis increases after age **40**.³

As we get older, our *clot-formation* systems start to outpace our *clot-breakdown* systems, making us more prone to clots.²¹

Researchers have found a potential solution to this problem: a combination of **nattokinase** and **French maritime pine bark extract**.

Anti-Clotting Activity of Nattokinase

Nattokinase is an *enzyme* extracted from fermented soybeans (**natto**).⁷

Scientists found that the **anti-clotting** power of nattokinase is **stronger than any other enzyme** in 173 different natural foods tested.²²

Nattokinase combats unwanted clotting in several different ways, including by:^{6-8,23,24}

- Decreasing the activation of **pro-clotting factors**,
- Breaking apart **fibrin**, the main protein in clots,
- Reducing the conversion of **fibrinogen** (a fibrin precursor) to fibrin, and
- Inhibiting **platelets** from clumping to form a clot.

These actions add up to powerful defense against deep vein thrombosis.

Putting Nattokinase to the Test

In a placebo-controlled study, 12 healthy men were given a single dose of **2,000 fibrinolytic units of nattokinase**.²³

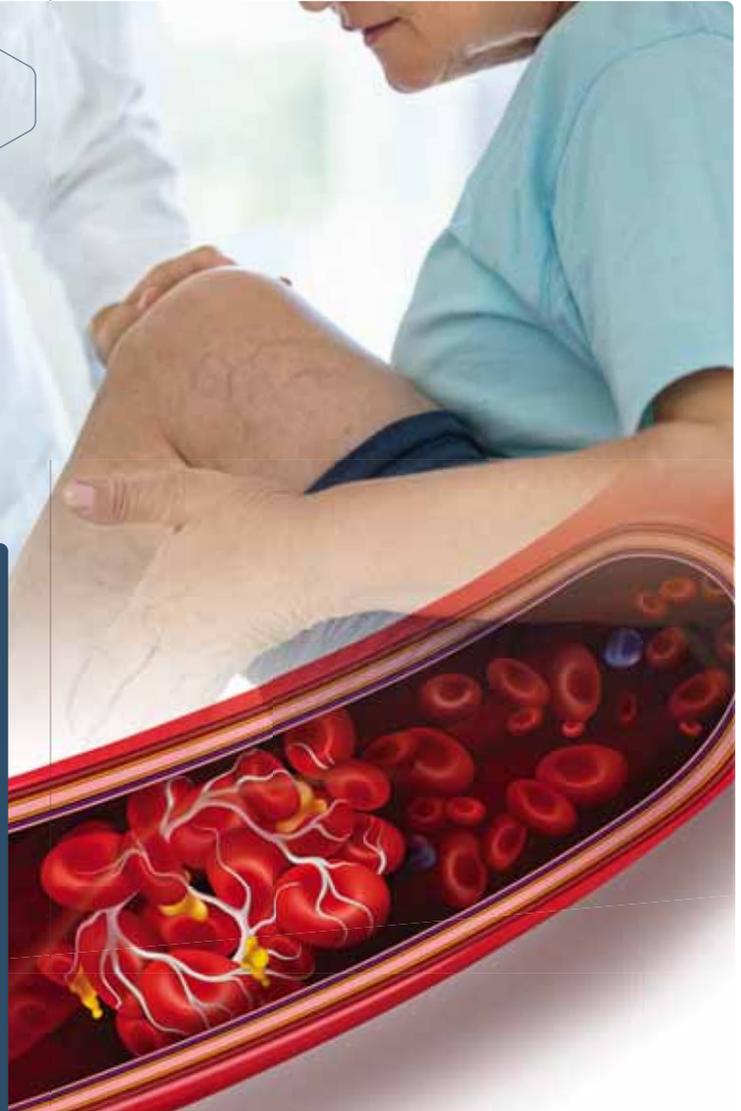
Markers of the anti-clotting and clot-disrupting properties of nattokinase were detected in the subjects' blood samples **within two hours** of just one single dose.

Other placebo-controlled human studies have shown that nattokinase can help decrease **high blood pressure**.^{25,26} In addition to increasing the risk of heart attacks and strokes, high blood pressure may raise the risk of clots.^{27,28}

WHAT
YOU
NEED
TO
KNOW

Defend Against Deep Vein Thrombosis

- Prolonged periods of sitting increase the risk of **deep vein thrombosis** or clots, particularly in the legs.
- These clots can break free and move to the lungs, where they can be **fatal**.
- A combination of the enzyme **nattokinase** and **French maritime pine bark extract** provides a safe, natural approach to combating leg swelling and clotting.
- This plant-based duo works in several different ways to inhibit **clot formation**, disrupt existing clots, decrease **edema**, and support circulation.
- In a controlled trial of people prone to deep vein thrombosis, a blend of nattokinase and French maritime pine bark extract **completely prevented** thrombotic events on a long flight, while **5.4%** of the placebo group developed deep vein clots.



Complete Relief

In a recent study, researchers tested nattokinase in 153 adults who sought medical treatment for **deep vein thrombosis** or related vascular disorders.⁶

All subjects took a daily dose of **2,000 fibrinolytic units** of nattokinase, either after a month-long course of an anticoagulant drug or after vascular surgery.

Nattokinase reduced symptoms *beyond* the previous drug or surgical treatment. It led to **complete remission** of subjects' remaining vascular symptoms.

The nattokinase produced these benefits **without side effects**.⁶ By contrast, medications for thrombosis carry a risk of adverse events like internal bleeding.^{29,30}

How French Maritime Pine Bark Helps

Extracts of **French maritime pine bark** are rich in plant compounds called **procyanidins**.³¹

These components provide **antioxidant, anti-inflammatory, and platelet-regulating** benefits, which help protect blood vessels.^{10,31-33}

Another way the extract may help support veins is by promoting **nitric oxide** production.³¹

This gaseous molecule is found in the **endothelium** (lining) of blood vessels. It promotes healthy blood flow.³⁴

In a preclinical screening of 13 polyphenol-rich plant extracts, *only* French maritime pine bark *improved* nitric oxide availability in both healthy and dysfunctional endothelial cells of veins.³⁵

Stop Swelling

Edema (swelling) in the lower legs is a common problem for individuals with **deep vein thrombosis**.

Normally, the one-way valves in leg veins prevent blood from flowing backwards and pooling in the lower legs. These valves also help move venous blood back to the heart. In people with deep vein thrombosis, the valves become damaged.³⁶

Doctors commonly recommend **compression stockings** to help reduce edema, but many people find them uncomfortable.³⁷

In a 12-month study, 156 patients with a history of a single, major thrombotic event were assigned either to take **French maritime pine bark extract** daily, wear compression socks, or do both.³⁸

The extract was significantly more *effective* than compression socks, from six months onward, for decreasing **leg edema**.

Two new incidents of **deep vein thrombosis** developed in the compression-sock group within three to six months. **No** new thrombosis happened in the groups taking the **pine bark extract**.³⁸

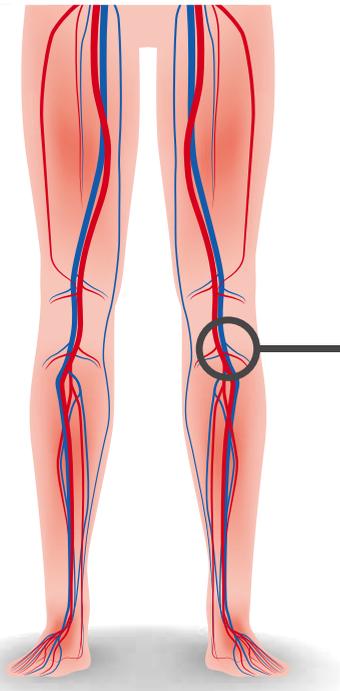
Prevent DVT Recurrence

Approximately **one-third** of people who experience deep vein thrombosis have another episode within 10 years.³⁹

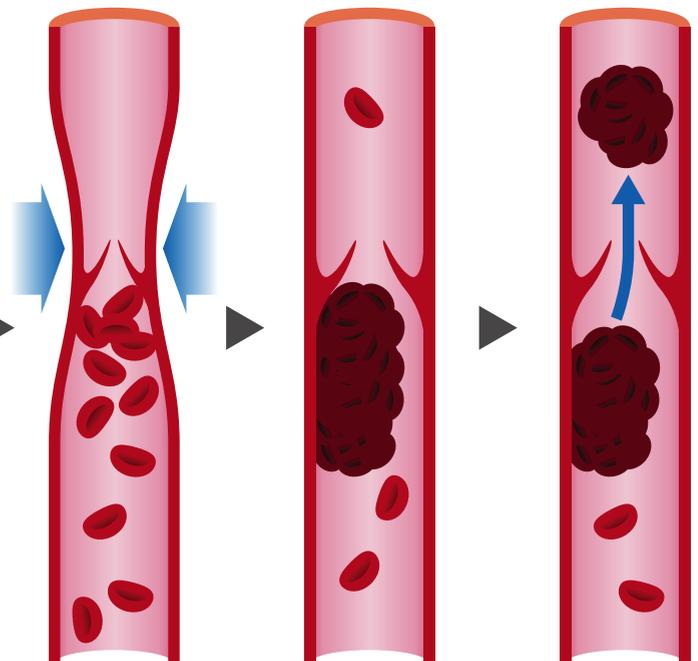
The highest risk of recurrence is within the first year. But a heightened risk remains for the **rest of a person's life**.³⁹

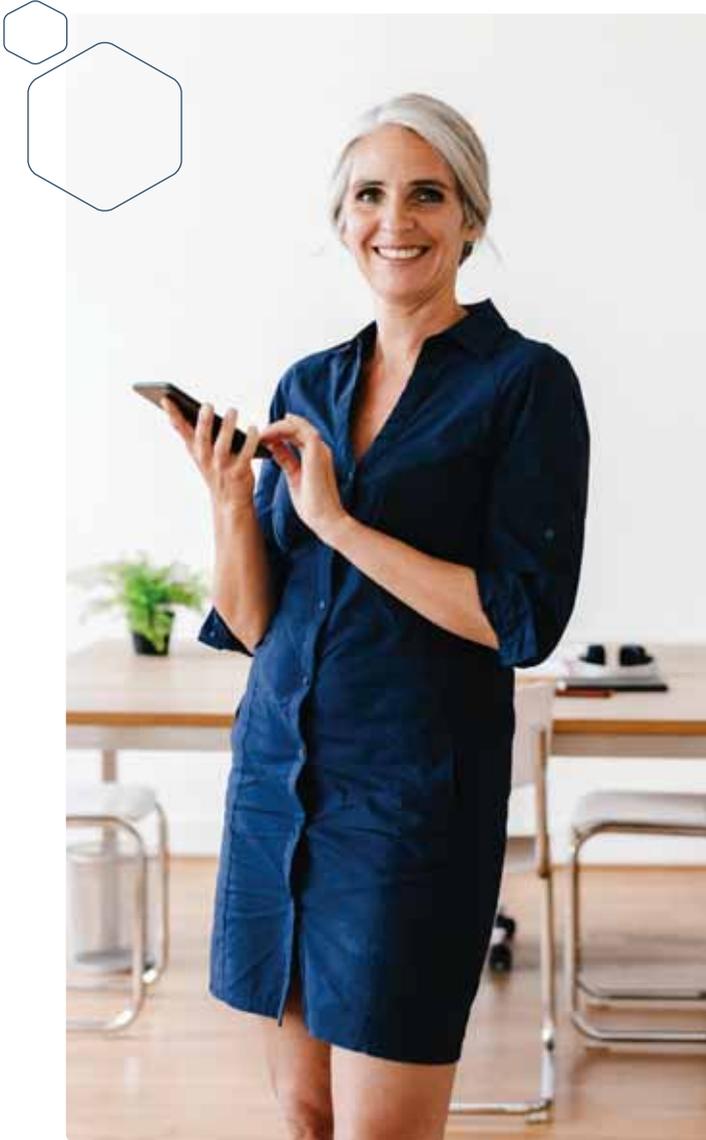
Lingering symptoms after recovery from deep vein thrombosis, called **post-thrombotic syndrome**, also occur in **43%** of cases within two years. These symptoms can include **chronic leg pain**, swelling, discoloration, and new varicose veins.^{3,40}

In an extensive study, scientists tested 815 people every six months for **six years** after their initial deep vein thrombosis.⁴¹



VEIN THROMBOSIS





All participants followed a standard lifestyle regimen of compression socks, weight control, and regular exercise.

Some participants also took **pine bark extract**, aspirin, or prescription drugs to prevent blood clots.

Only **3.6%** of those who took the extract developed recurrent deep vein thrombosis and post-thrombotic syndrome, while in the group that followed only the standard management, **14.9%** did.

Pine bark extract was significantly more effective than medications. Recurrent deep vein thrombosis and post-thrombotic syndrome occurred in **12.9%** of those using aspirin and in **6.7%** and **10.7%** of those treated with prescription anticoagulants (but only in **3.6%** of those taking pine bark extract).

More Powerful Together

Combining nattokinase and French maritime pine bark extract provides defense against deep vein thrombosis.¹⁰

In a randomized, controlled study of 204 people taking long international flights, researchers gave half the group a blend of **nattokinase** and **French maritime pine bark extract** two hours before their flight, and again six hours later. The other half were given placebos.¹⁰

All subjects were at **high risk** for deep vein thrombosis, based on their past medical history, including previous episodes of the condition. Preflight, the two groups had equal levels of leg edema.

Exercise and hydration suggestions were given to both groups. The exercise plan consisted of mild, mainly isometric exercise including standing and moving legs for 5 to 10 minutes every hour. The hydration suggestion was to drink **3.4 to 5 oz.** of water every hour.

While **5.4%** of the placebo group developed flight-related deep vein thrombosis, the treatment group had **no** cases.

In addition, the placebo group had a **12% increase** in ankle edema while the treatment group had a **15% decrease**.

This study demonstrates the ability of the combination of nattokinase and French maritime pine bark extract to prevent edema and thrombosis.

Summary

The **deep veins** of our legs are prone to develop clots when we sit for long periods of time, such as on airplanes or at work.

Besides causing uncomfortable leg swelling, **deep vein thrombosis** carries the risk of the clot breaking free, traveling to the lungs, and causing a potentially fatal embolism.

Nattokinase and **French maritime pine bark extract** work together to promote healthy blood flow and inhibit venous blood clots.

Clinical trials have proven the protective circulatory benefits of these plant compounds in high-risk groups, including people on long flights and those with a history of deep vein thrombosis. •

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

References

1. Matthews CE, Chen KY, Freedson PS, et al. Amount of time spent in sedentary behaviors in the United States, 2003-2004. *Am J Epidemiol*. 2008 Apr 1;167(7):875-81.
2. Benjamin Wedro M, FACEP, FAAEM. Deep Vein Thrombosis (DVT, Blood Clot in the Legs). *MedicineNet*. 2021.
3. Waheed SM, Kudaravalli P, Hotwagner DT. Deep Vein Thrombosis. *StatPearls*. Treasure Island (FL)2021.
4. Stubbs MJ, Mouyis M, Thomas M. Deep vein thrombosis. *BMJ*. 2018 Feb 22;360:k351.
5. Budnik I, Brill A. Immune Factors in Deep Vein Thrombosis Initiation. *Trends Immunol*. 2018 Aug;39(8):610-23.
6. Gallelli G, Di Mizio G, Palleria C, et al. Data Recorded in Real Life Support the Safety of Nattokinase in Patients with Vascular Diseases. *Nutrients*. 2021 Jun 13;13(6).
7. Chen H, McGowan EM, Ren N, et al. Nattokinase: A Promising Alternative in Prevention and Treatment of Cardiovascular Diseases. *Biomark Insights*. 2018;13:117271918785130.
8. Hsia CH, Shen MC, Lin JS, et al. Nattokinase decreases plasma levels of fibrinogen, factor VII, and factor VIII in human subjects. *Nutr Res*. 2009 Mar;29(3):190-6.
9. Rohdewald P. Pleiotropic Effects of French Maritime Pine Bark Extract to Promote Healthy Aging. *Rejuvenation Res*. 2019 Jun;22(3):210-7.
10. Cesarone MR, Belcaro G, Nicolaidis AN, et al. Prevention of venous thrombosis in long-haul flights with Flite Tabs: the LONFLIT-FLITE randomized, controlled trial. *Angiology*. 2003 Sep-Oct;54(5):531-9.
11. Bailey DP, Hewson DJ, Champion RB, et al. Sitting Time and Risk of Cardiovascular Disease and Diabetes: A Systematic Review and Meta-Analysis. *Am J Prev Med*. 2019 Sep;57(3):408-16.
12. Tansey EA, Montgomery LEA, Quinn JG, et al. Understanding basic vein physiology and venous blood pressure through simple physical assessments. *Adv Physiol Educ*. 2019 Sep 1;43(3):423-9.
13. Kucharzewski M, Duda K, Doman A, et al. The Awareness of Airline Passengers About the Risk of Deep Venous Thrombosis during an Aeroplane Flight. *Phlebological Review*. 2021;29(1):26-31.
14. Stone J, Hangge P, Albadawi H, et al. Deep vein thrombosis: pathogenesis, diagnosis, and medical management. *Cardiovasc Diagn Ther*. 2017 Dec;7(Suppl 3):S276-S84.
15. Essien EO, Rali P, Mathai SC. Pulmonary Embolism. *Med Clin North Am*. 2019 May;103(3):549-64.
16. Available at: <https://www.cdc.gov/ncbddd/dvt/facts.html>. Accessed October 22, 2021.
17. Li F, Wang X, Huang W, et al. Risk factors associated with the occurrence of silent pulmonary embolism in patients with deep venous thrombosis of the lower limb. *Phlebology*. 2014 Aug;29(7):442-6.
18. Kuipers S, Cannegieter SC, Middeldorp S, et al. The absolute risk of venous thrombosis after air travel: a cohort study of 8,755 employees of international organisations. *PLoS Med*. 2007 Sep;4(9):e290.
19. Beasley R, Raymond N, Hill S, et al. eThrombosis: the 21st century variant of venous thromboembolism associated with immobility. *Eur Respir J*. 2003 Feb;21(2):374-6.
20. Lichota A, Szewczyk EM, Gwozdziński K. Factors Affecting the Formation and Treatment of Thrombosis by Natural and Synthetic Compounds. *Int J Mol Sci*. 2020 Oct 27;21(21).
21. Favalaro EJ, Franchini M, Lippi G. Aging hemostasis: changes to laboratory markers of hemostasis as we age - a narrative review. *Semin Thromb Hemost*. 2014 Sep;40(6):621-33.
22. Sumi H, Hamada H, Nakanishi K, et al. Enhancement of the fibrinolytic activity in plasma by oral administration of nattokinase. *Acta Haematol*. 1990;84(3):139-43.
23. Kurosawa Y, Nirengi S, Homma T, et al. A single-dose of oral nattokinase potentiates thrombolysis and anti-coagulation profiles. *Sci Rep*. 2015 Jun 25;5:11601.
24. Jang JY, Kim TS, Cai J, et al. Nattokinase improves blood flow by inhibiting platelet aggregation and thrombus formation. *Lab Anim Res*. 2013 Dec;29(4):221-5.
25. Jensen GS, Lenninger M, Ero MP, et al. Consumption of nattokinase is associated with reduced blood pressure and von Willebrand factor, a cardiovascular risk marker: results from a randomized, double-blind, placebo-controlled, multicenter North American clinical trial. *Integr Blood Press Control*. 2016;9:95-104.
26. Kim JY, Gum SN, Paik JK, et al. Effects of nattokinase on blood pressure: a randomized, controlled trial. *Hypertens Res*. 2008 Aug;31(8):1583-8.
27. Huang L, Li J, Jiang Y. Association between hypertension and deep vein thrombosis after orthopedic surgery: a meta-analysis. *Eur J Med Res*. 2016 Mar 22;21:13.
28. Singh S, Shankar R, Singh GP. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi. *Int J Hypertens*. 2017;2017:5491838.
29. Braun G. [Management of bleeding in patients on antithrombotic therapy]. *Med Klin Intensivmed Notfmed*. 2021 Sep;116(6):491-8.
30. Rivera-Caravaca JM, Camelo-Castillo A, Ramirez-Macias I, et al. Antithrombotic Therapy in Patients with Peripheral Artery Disease: A Focused Review on Oral Anticoagulation. *Int J Mol Sci*. 2021 Jul 1;22(13).
31. Lichota A, Gwozdziński L, Gwozdziński K. Therapeutic potential of natural compounds in inflammation and chronic venous insufficiency. *Eur J Med Chem*. 2019 Aug 15;176:68-91.
32. Golanski J, Muchova J, Golanski R, et al. Does pycnogenol intensify the efficacy of acetylsalicylic acid in the inhibition of platelet function? In vitro experience. *Postepy Hig Med Dosw (Online)*. 2006;60:316-21.
33. Grimm T, Schafer A, Hogger P. Antioxidant activity and inhibition of matrix metalloproteinases by metabolites of maritime pine bark extract (pycnogenol). *Free Radic Biol Med*. 2004 Mar 15;36(6):811-22.
34. Hartono F, Yusuf I, Suhadi B, et al. Trauma magnitude of the meta-epiphyseal cancellous affects the incidence of deep vein thrombosis. A prospective cohort study on the dynamic of Collagen I, Collagen IV, Tissue factor, P-Selectin and Nitric Oxide in the thrombus formation following hip and knee surgeries. *Ann Med Surg (Lond)*. 2021 Mar;63:102190.
35. Jones HS, Papageorgiou M, Gordon A, et al. Physiologically relevant screening of polyphenol-rich commercial preparations for bioactivity in vascular endothelial cells and application to healthy volunteers: A viable workflow and a cautionary tale. *Biochem Pharmacol*. 2020 Mar;173:113754.
36. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK425364/>. Accessed October 22, 2021.
37. Gong JM, Du JS, Han DM, et al. Reasons for patient non-compliance with compression stockings as a treatment for varicose veins in the lower limbs: A qualitative study. *PLoS One*. 2020;15(4):e0231218.
38. Errichi BM, Belcaro G, Hosoi M, et al. Prevention of post thrombotic syndrome with Pycnogenol(R) in a twelve month study. *Panminerva Med*. 2011 Sep;53(3 Suppl 1):21-7.
39. Beckman MG, Hooper WC, Critchley SE, et al. Venous thromboembolism: a public health concern. *Am J Prev Med*. 2010 Apr;38(4 Suppl):S495-501.
40. Vazquez SR, Kahn SR. Postthrombotic syndrome. *Cardiology Patient Page. Circulation*. 2010 Mar 2;121(8):e217-9.
41. Belcaro G, Dugall M, Hu S, et al. Prevention of recurrent venous thrombosis and post-thrombotic syndrome. *Minerva Cardioangiol*. 2018 Jun;66(3):238-45.

SIMPLIFY YOUR SUPPLEMENT INTAKE

Once Daily Health Booster and Mitochondrial Energy Optimizer with PQQ combine multiple ingredients into a single formula.



Mitochondrial Energy Optimizer with PQQ

Promotes healthy mitochondria, the cellular structures that produce energy needed by the entire body.

Carnosine	1,000 mg
Taurine	800 mg
Benfotiamine	150 mg
R-lipoic acid	150 mg
Pyridoxal 5'-Phosphate	100 mg
PQQ—Pyrroloquinoline quinone	10 mg

SUPER SALE PRICE

Mitochondrial Energy Optimizer with PQQ

Item #01868 | 120 vegetarian capsules
1 bottle **\$45.90** | 4 bottles \$40.50 each



Once-Daily Health Booster

Vitamin K (four forms), vision guarding carotenoids, plus cell-protecting tocotrienols, lycopene and chlorophyllin.

Vitamin K1	2,000 mcg	Chlorophyllin	100 mg
Vitamin K2 (MK-4)	1,500 mcg	Saffron	20 mg
Vitamin K2 (MK-7)	181 mcg	Lycopene	10 mg
Vitamin K2 (MK-9)	43 mcg	MacuGuard®	173 mg
Vitamin K2 (MK-6)	11 mcg	(Zeaxanthin + Lutein + Meso-zeaxanthin)	
Mixed tocotrienols	55 mg		

SUPER SALE PRICE

Once-Daily Health Booster*

Item #02291 | 60 softgels
1 bottle **\$40.50** | 4 bottles \$36 each (2-month supply)

***Caution:** If you are taking Warfarin (Coumadin®) or related medications, consult with your healthcare provider before taking this product.



For full product description and to order **Mitochondrial Energy Optimizer with PQQ** and/or **Once-Daily Health Booster**, call 1-800-544-4440 or visit www.LifeExtension.com

Bio-Enhanced® is a registered trademark of Geronova Research, Inc. Lyc-O-Mato® is a registered trademark of Lycored, Corp. LuteinPlus® and Mz® are registered trademarks of NutriProducts Ltd., UK, licensed under U.S. Patent 8,623,428. Trans menaquinone-7 as K2VITAL®, K2VITAL® is a registered trademark of Kappa BioScience.

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.

BROAD-SPECTRUM IMMUNE SUPPORT

Lactoferrin is a component of **wehey protein** best known for its **immune benefits**.

An array of published studies describes how **lactoferrin** up-regulates innate and adaptive **immune** responses to a variety of antigens.



SUPER SALE PRICE

Item #01681 • 300 mg, 60 vegetarian capsules

1 bottle **\$40.50** • 2 bottles **\$36** each

(Two-Month Supply)

Contains milk.

Bioferrin® is a registered trademark of Glanbia.



For full product description and to order
Lactoferrin 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.

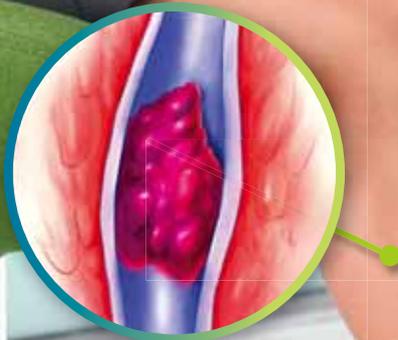
OPTIMIZE YOUR **VENOUS** **BLOOD** **FLOW!**

For those who find themselves sitting for long periods of time at the office, in daily commutes, or when traveling by plane, the proprietary blend of nutrients in **VenoFlow™** promotes healthy venous blood flow.

Just one capsule of **VenoFlow™** provides **nattokinase** (providing 2,000 fibrinolytic units) and **procyanidins** derived from French maritime pine bark (Pycnogenol®).

CAUTION: Consult your healthcare provider before use if taking medication (especially those affecting blood coagulation or blood pressure), being treated for a medical condition (especially bleeding disorders), under the age of 18, pregnant, or lactating.

Pycnogenol® is a registered trademark of Horphag Research Ltd.



SUPER SALE PRICE

Item #02102 • 30 vegetarian capsules

1 bottle \$35.10 • 4 bottles \$32.40 each

For full product description and to order **VENOFLOW™**, 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.



Low-Cost Biologically Active

B COMPLEX

Enzymatically Active Vitamins

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 shown to protect lipids and proteins against **glycation** and the most biologically active form of **folate** called *5-methyltetrahydrofolate (5-MTHF)*, which is up to **7 times more** bioavailable than folic acid.*

SUPER SALE PRICE

Item #01945 • 60 vegetarian capsules

1 bottle **\$8.10** • 4 bottles \$7.20 each

For full product description and to order **BioActive Complete B-Complex**, call 1-800-544-4440 or visit www.LifeExtension.com

* *Br J Pharmacol.* 2004 Mar;141(5):825-30.



Caution: Temporary flushing, itching, rash, or gastric disturbances may occur.

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.

VINPOCETINE

Improves Hearing Capacity

BY CHANCELLOR FALOON



Vinpocetine is a derivative of a compound found in the **periwinkle** plant.¹

It has demonstrated benefits for a range of conditions, including cerebral vascular disorders, seizures, and hearing loss.^{1,2}

In a clinical study published in **2021**, vinpocetine was tested on patients with **sensorineural hearing loss**, which is caused by damaged hair cells in the inner ear.² Twelve months of vinpocetine intake (**30 mg/day**) significantly *reduced* the rate of deterioration and **improved hearing capacity**.

The effects of vinpocetine on increasing brain blood flow, reducing injury to blood vessels, and enhancing cerebral metabolism were uncovered decades ago.¹

In preclinical models, **vinpocetine** has shown protective effects against **ischemia-reperfusion injury**, the damage that occurs to tissues and organs when, following blockage of an artery, the oxygen-rich blood flow is restored.¹

Research to improve stroke outcomes, in two randomized, controlled trials, showed that intravenous (IV) **vinpocetine** combined with conventional therapy significantly improved outcomes following an **acute ischemic stroke** compared to conventional therapy alone.^{3,4}

Patients were given IV vinpocetine daily for **one to two weeks** after diagnosis of a stroke. In both studies, vinpocetine treatment led to a greater **improvement** on a range of outcomes such as mental state, inflammatory response, and neurological function.

Vinpocetine also displayed remarkable benefits for those with **seizure disorder**.

In a clinical trial, patients were treated with conventional anti-epileptic drugs and were randomized to receive either daily vinpocetine or a placebo.⁵ After eight weeks, **69%** of the vinpocetine-treated patients had a **50%** reduction in seizures, compared to only **13%** of the placebo group.

New studies are now paving the way for further investigations into vinpocetine:

- In a cell culture study, vinpocetine **reduced inflammation** caused by the bacteria responsible for **otitis media** (middle ear infection).⁶
- In an animal model of **Alzheimer's disease**, vinpocetine protected against deterioration in certain brain regions and reduced levels of **beta-amyloid** and **phosphorylated tau** proteins, both associated with Alzheimer's disease severity.⁷

Vinpocetine provides wide-reaching benefits for brain and nervous system health. Research continues to uncover additional uses. •

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

References

1. Zhang YS, Li JD, Yan C. An update on vinpocetine: New discoveries and clinical implications. *Eur J Pharmacol*. 2018 Jan 15;819:30-4.
2. Gutierrez-Farfan I, Reyes-Legorreta C, Solis-Olguin M, et al. Evaluation of vinpocetine as a therapy in patients with sensorineural hearing loss: A phase II, open-label, single-center study. *J Pharmacol Sci*. 2021 Apr;145(4):313-8.
3. Zhang W, Huang Y, Li Y, et al. Efficacy and Safety of Vinpocetine as Part of Treatment for Acute Cerebral Infarction: A Randomized, Open-Label, Controlled, Multicenter CAVIN (Chinese Assessment for Vinpocetine in Neurology) Trial. *Clin Drug Investig*. 2016 Sep;36(9):697-704.
4. Zhang F, Yan C, Wei C, et al. Vinpocetine Inhibits NF-kappaB-Dependent Inflammation in Acute Ischemic Stroke Patients. *Transl Stroke Res*. 2018 Apr;9(2):174-84.
5. Garza-Morales S, Briceno-Gonzalez E, Ceja-Moreno H, et al. Extended-release vinpocetine: a possible adjuvant treatment for focal onset epileptic seizures. *Bol Med Hosp Infant Mex*. 2019;76(5):215-24.
6. Komatsu K, Nam DH, Lee JY, et al. Vinpocetine Suppresses Streptococcus pneumoniae-Induced Inflammation via Inhibition of ERK1 by CYLD. *J Immunol*. 2020 Feb 15;204(4):933-42.
7. Ali AA, Ahmed HI, Khaleel SA, et al. Vinpocetine mitigates aluminum-induced cognitive impairment in socially isolated rats. *Physiol Behav*. 2019 Sep 1;208:112571.



PERIWINKLE PLANT



FORESIGHT FOR YOUR EYESIGHT

MacuGuard® Ocular Support provides:

- > **Lutein, trans-zeaxanthin, and meso-zeaxanthin** help maintain structural integrity of the **macula** and **retina**.¹⁻⁵
- > **Cyanidin-3-glucoside** assists with night vision.⁶⁻⁸
- > **Saffron** has been shown to help support **vision** as demonstrated by doctors' eye exams.¹
- > **Alpha-carotene** further helps support **macular density**.¹



For full product description and to order either of these **MacuGuard®** formulas, call 1-800-544-4440 or visit www.LifeExtension.com

References

1. *JAMA Ophthalmol.* 2015;133(12):1415-24.
2. *Nutrients.* 2013 April;5(4):1169-85.
3. *Nutrition.* 2011 Sep;27(9):960-6.
4. *Free Radic Biol Med.* 2012;53(6):1298-307.
5. *J Ophthalmol.* 2015;2015:523027.
6. *Evid Based Complement Alternat Med.* 2012;2012:429124.
7. *Invest Ophthalmol Vis Sci.* 2010;51(12):6118-24.
8. *J Agric Food Chem.* 2003 Jun 4;51(12):3560-3.

MacuGuard® Ocular Support with Saffron + Astaxanthin
SUPER SALE PRICE

Item #01993 • 60 softgels

1 bottle **\$29.70** • 4 bottles \$27 each

MacuGuard® Ocular Support with Saffron
SUPER SALE PRICE

Item #01992 • 60 softgels

1 bottle **\$16.88** • 4 bottles \$15.75 each

(Each bottle lasts for two months.)

MacuGuard® Ocular Support is available with or without astaxanthin.

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



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.

Maintain Youthful HOMOCYSTEINE LEVELS

FOR BRAIN, HEART, AND HEARING HEALTH

Homocysteine Resist supports healthy levels of homocysteine, an unfavorable amino acid that can increase with normal aging.



SUPER SALE PRICE

Item #02121 • 60 vegetarian capsules

1 bottle \$17.55 • 4 bottles \$15.75 each

Just one daily capsule of **HOMOCYSTEINE RESIST** provides:

5-MTHF (activated folate)	8,500 mcg ^o
Methylcobalamin (activated vitamin B12)	1,000 mcg
Pyridoxal 5'-phosphate (activated vitamin B6)	100 mg
Riboflavin (vitamin B2)	25 mg

^oDEF (Dietary Folate Equivalents)

CAUTION: Do not use this product if treated with methotrexate, fluorouracil, phenytoin, phenobarbital, primidone, or levodopa prior to consultation with your healthcare provider.



For full product description and to order **Homocysteine Resist**, 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.



Maintain Better Memory Function

VINPOCETINE

A compound originally found in the leaf of the periwinkle plant, vinpocetine has been shown to support brain health and memory function as people age.

Among its many benefits, vinpocetine has been shown to:

- Provide support for age-related cognitive decline
- Support healthy blood flow inside the brain



SUPER SALE PRICE

Item #01327 • 100 vegetarian tablets

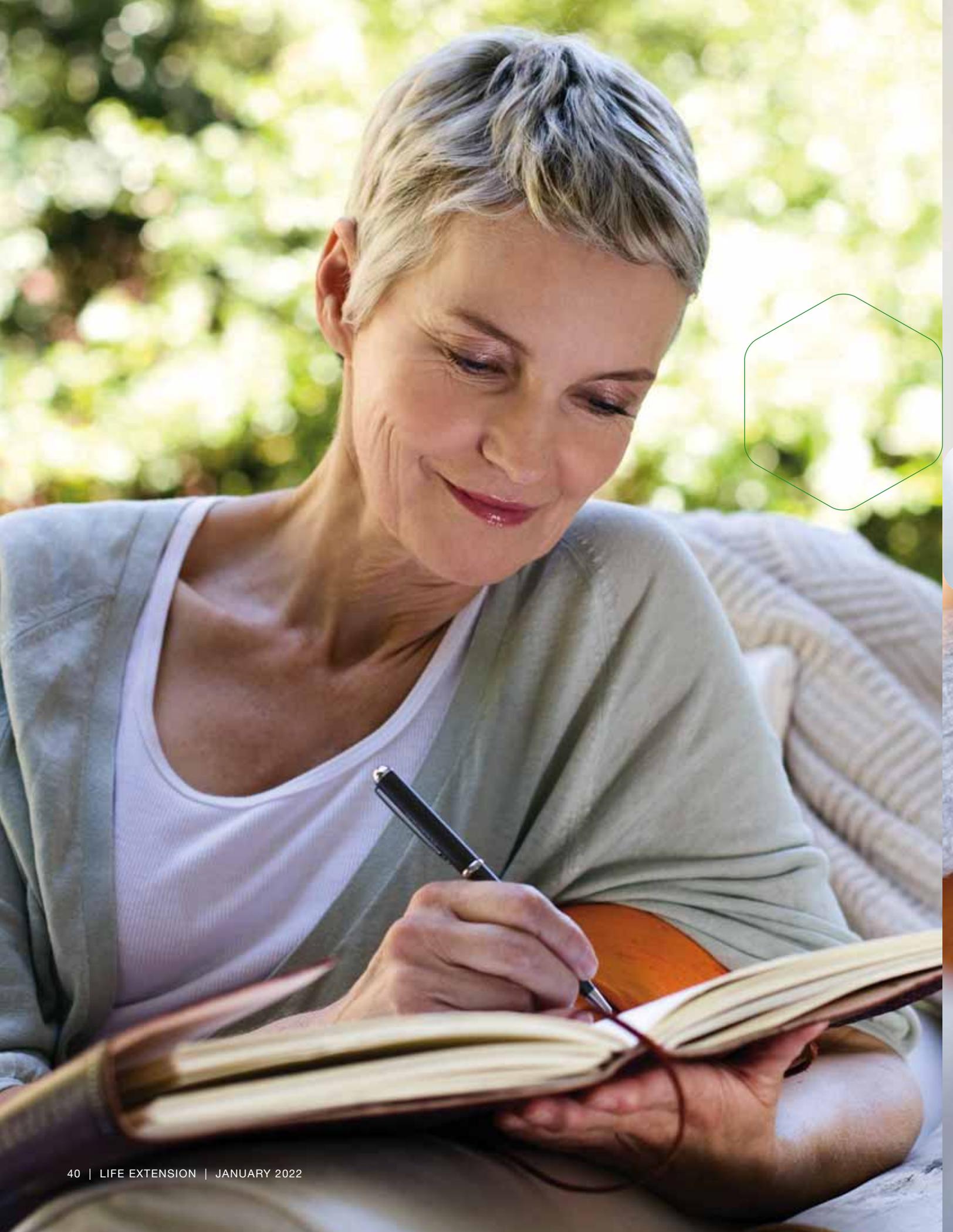
1 bottle **\$12.15**

4 bottles \$9.45 each

For full product description and to order **Vinpocetine**, 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.





Nutrients to *Reduce* Memory Loss



BY MIKE JENSEN

Nearly **50%** of adults aged 65 and older suffer from early-stage **memory deficits**, mild cognitive impairment, or worse.¹

Over **30%** of those suffering from *early cognitive decline* will progress to full-blown **dementia** within just **five years**.²

But there's good news: Two nutrients have been shown in **clinical studies** to help protect cognitive function, stop memory loss and even possibly **reverse** early symptoms of cognitive decline.³⁻⁶

In one study following patients over four years, a trend was observed in which **low-dose lithium** lowered the risk of mild cognitive impairment progressing to dementia by nearly **half**, compared to those who took a placebo.³

In another, **54%** of patients with early-stage Alzheimer's who took a **proline-rich peptide complex** had **improvements** in their cognitive scores over the course of a year, while those taking a **placebo** deteriorated.⁵

A Progressive Condition

The risk for **cognitive decline** increases with age. It is also **progressive**, meaning it grows over time with symptoms that include confusion and memory loss.

Only about **3%** of people aged 65 to 74 have a diagnosis of full-blown **dementia**. But that number jumps to nearly **30%** in those **85** and older.⁷

No approved drugs have been shown to significantly improve **brain function** once a diagnosis of dementia is made.

But scientists have found that some **nutrients** may slow the progression of the disease, and possibly **halt or reverse its progression**.^{3-6,8,9}

Two of these nutrients, **lithium** and a **proline-rich polypeptide complex**, work by targeting the changes that occur in the brain with aging.

Brain Changes and Dementia

The brain undergoes **structural changes** as normal aging progresses.

These changes cause death and dysfunction of brain cells, **shrinking** the volume of the brain. This damage is associated with the **memory** deficits seen with mild cognitive impairment and dementia.

One of the most notable structural changes in the aging brain is the buildup of **toxic protein clumps**.

In youth, cells have means of **clearing** abnormal or damaged proteins. With older age, these cleaning mechanisms become less efficient, and the protein deposits build up.

Over time, these toxic proteins damage the brain and kill brain cells. They have generally been thought to interfere with brain function and healthy cognition.

A key player in brain aging is an *enzyme* known as **glycogen synthase kinase 3 (GSK-3)**.

Ordinarily, this enzyme plays a role in the management of glucose metabolism. But in older age it can become **overactive**.¹⁰

Excess GSK-3 activity is a significant contributor to the formation of **toxic protein clumps**.^{11,12}

Much research has been dedicated to finding ways to **prevent** the buildup of toxic proteins and to normalize GSK-3 activity. Two nutrients have been identified that do just that.

Lithium Protects the Brain

Very high doses of lithium have long been used to treat the psychiatric condition bipolar disorder.

But research shows that **lithium** in **low doses** is important for overall health and cognition.⁶

One of the ways lithium can work to preserve mental function and prevent cognitive decline is by improving the brain's ability to **clear amyloid** proteins. In a mouse model of Alzheimer's, lithium treatment increased brain clearance of amyloid by **31%** while reversing long-term memory deficits.¹³

Other studies show that **low-dose** lithium reduces toxic protein clumps in the brain as well.¹⁴



Additional animal and cell studies have shown that lithium also protects the brain by helping to improve cellular “housekeeping,” mitochondrial function, production of brain growth factors, and more.¹⁵

Human Trials of Lithium

Lithium may help slow the worsening of cognitive decline.

In one clinical study, a micro-dose of just **300 mcg** of **lithium** daily was found to significantly decrease cognitive decline in Alzheimer’s patients, compared to a **placebo**.⁶

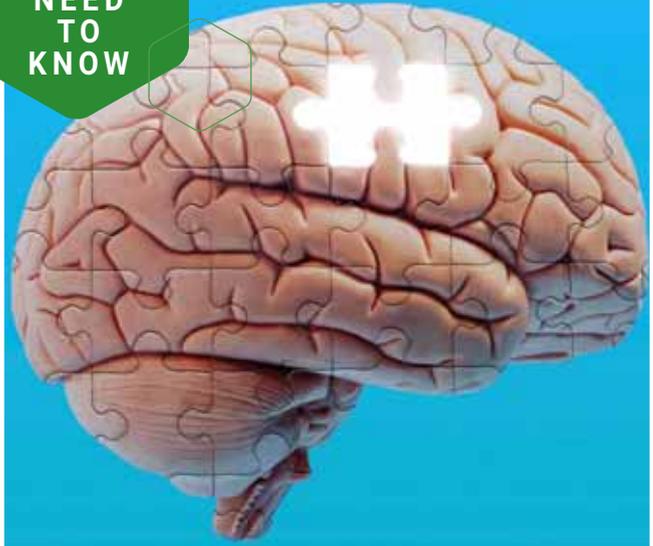
Another study evaluated **low-dose lithium** in older adults with **mild cognitive impairment** and memory loss.³ These patients are at high risk of progressing to worse cognitive function and, eventually, dementia.

Subjects were randomized to receive either **lithium** or a **placebo** for **two years**. The **placebo** group showed significant functional *and* cognitive decline on dementia scales over the study period.

The **lithium** group, on the other hand, remained **stable**, with better performance on **memory** and **attention** tasks.

Researchers continued to follow these patients for a total of **four years** and compared them to those who took a **placebo**. They observed a trend in which low-dose **lithium** lowered the risk of mild cognitive impairment progressing to **dementia** by nearly **half**.

WHAT
YOU
NEED
TO
KNOW



Help Prevent Brain Aging

- Memory loss and **cognitive decline** are extremely common in older age. They often progress to full-blown dementia.
- Small doses of the mineral **lithium** inhibit the enzyme **GSK-3**, associated with risk for cognitive dysfunction and the progression of structural damage to the brain.
- A **proline-rich polypeptide complex** derived from milk has been shown in preclinical studies to reduce **amyloid** and **tau** protein deposition in the brain, as well as the resulting loss of brain cells.
- Clinical studies show that untreated individuals with **mild cognitive impairment** or **Alzheimer’s disease** tend to worsen significantly over time. But those given lithium or a proline-rich polypeptide complex remain stable or even experience *improvement in cognitive function*.





Looking for further evidence of brain protection with lithium,¹⁶ researchers reviewed randomized controlled trials, prospective observational studies, and meta-analyses published in the medical literature.

They found **level 1 evidence**—the *highest* level of scientific evidence—that **lithium** use is associated with greater beneficial brain **gray-matter** volume.

In cognitive decline, the volume of gray matter (where brain cells reside) typically *shrinks* over time due to cell death. Lithium appears to preserve brain volume in multiple brain regions, including the **hippocampus**, which is critical for the formation of new memories.

Proline-Rich Polypeptides Fight Brain Aging

Colostrum is the early milk that mothers produce after a baby is born. **Peptides** (protein fragments) isolated from mother’s milk contain large amounts of the amino acid **proline**.

This **proline-rich polypeptide complex** has been found to help aging brains resist those harmful structural changes.

Intake of this polypeptide complex alters expression of **genes** associated with the production of **amyloid** and the abnormal modification of **tau** proteins that lead to neurofibrillary tangles.¹⁷

In laboratory studies, this polypeptide complex mimics the effects of **nerve growth factors** by causing changes in some cells, including helping immature cells mature into **functional** cells. This increases the **growth of nerve fibers**.^{18,19}

In a mouse model of accelerated aging, use of the proline-rich polypeptide complex improved **learning** and **memory** and extended average **lifespan** by **26%**.²⁰

Human Studies of Proline-Rich Polypeptides

In a randomized controlled trial, subjects with early-stage **Alzheimer’s disease** received either the **proline-rich polypeptide complex** or a **placebo**.⁵ Cognitive impairment was evaluated by scores on the Mini-Mental State Examination.²¹

After **one year**, those in the **placebo** group had a significant *reduction* in Mini-Mental State Examination scores.

But an astonishing **54%** of those taking the polypeptides had **improvements** in their cognitive scores. The remainder were **stable**, without *any* worsening of cognitive function.

Those who had milder symptoms at the start of the study showed the greatest improvement on average, suggesting that starting to take the complex *early* is most beneficial.

The same group of researchers performed another study that followed subjects for a longer period, some for as long as 28 months.⁴ At every time interval tested, cognitive function scores continued to *improve* for those in the **proline-rich polypeptide** group.

Patients with an Alzheimer's diagnosis typically deteriorate over any period of observation. To see an *improvement* in cognitive function is a remarkable achievement.

The **proline-rich polypeptide complex** and **lithium** work in very different ways to preserve cognitive function. Taking these nutrients in combination may maximize their ability to help protect the brain.

Summary

Memory loss and cognitive decline are common with advancing age. Many people with mild cognitive dysfunction eventually progress to Alzheimer's disease or other forms of dementia.

Currently available medications do little to slow the progression of cognitive dysfunction. However, low doses of the trace mineral **lithium** and a milk-derived **proline-rich polypeptide complex** show great promise in clinical trials.

Both have shown that they help block the progression of the **amyloid** and **tau** protein structural damage that occurs in aging brains.

In human studies, the nutrients stabilize or even **reverse** signs of cognitive dysfunction, while those taking a placebo tend to deteriorate over time.

Many readers of this magazine take low-dose **(1,000 mcg) lithium** daily for potential longevity benefits, as well as neurological protection.

Those who want to take a combination of **300 mcg of lithium** plus **proline-rich polypeptide** can safely continue supplementing with **1,000 mcg of lithium**. •

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

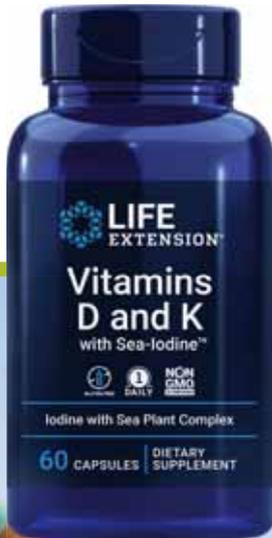


References

1. Aigbogun MS, Stellhorn R, Krasa H, et al. Severity of memory impairment in the elderly: Association with health care resource use and functional limitations in the United States. *Alzheimers Dement (Amst)*. 2017;8:51-9.
2. Ward A, Tardiff S, Dye C, et al. Rate of conversion from prodromal Alzheimer's disease to Alzheimer's dementia: a systematic review of the literature. *Dement Geriatr Cogn Dis Extra*. 2013;3(1):320-32.
3. Forlenza OV, Radanovic M, Talib LL, et al. Clinical and biological effects of long-term lithium treatment in older adults with amnesic mild cognitive impairment: randomised clinical trial. *Br J Psychiatry*. 2019 Nov;215(5):668-74.
4. Leszek J, Inglot AD, Janusz M, et al. Colostrin proline-rich polypeptide complex from ovine colostrum--a long-term study of its efficacy in Alzheimer's disease. *Med Sci Monit*. 2002 Oct;8(10):PI93-6.
5. Leszek J, Inglot AD, Janusz M, et al. Colostrin: a proline-rich polypeptide (PRP) complex isolated from ovine colostrum for treatment of Alzheimer's disease. A double-blind, placebo-controlled study. *Arch Immunol Ther Exp (Warsz)*. 1999;47(6):377-85.
6. Nunes MA, Viel TA, Buck HS. Microdose lithium treatment stabilized cognitive impairment in patients with Alzheimer's disease. *Curr Alzheimer Res*. 2013 Jan;10(1):104-7.
7. Langa KM, Larson EB, Crimmins EM, et al. A Comparison of the Prevalence of Dementia in the United States in 2000 and 2012. *JAMA Intern Med*. 2017 Jan 1;177(1):51-8.
8. Casey DA, Antimisiaris D, O'Brien J. Drugs for Alzheimer's disease: are they effective? *P T*. 2010 Apr;35(4):208-11.
9. Yiannopoulou KG, Papageorgiou SG. Current and future treatments for Alzheimer's disease. *Ther Adv Neurol Disord*. 2013 Jan;6(1):19-33.
10. Lauretti E, Dincer O, Pratico D. Glycogen synthase kinase-3 signaling in Alzheimer's disease. *Biochim Biophys Acta Mol Cell Res*. 2020 May;1867(5):118664.
11. Hanger DP, Hughes K, Woodgett JR, et al. Glycogen synthase kinase-3 induces Alzheimer's disease-like phosphorylation of tau: generation of paired helical filament epitopes and neuronal localisation of the kinase. *Neurosci Lett*. 1992 Nov 23;147(1):58-62.
12. Noble W, Planel E, Zehr C, et al. Inhibition of glycogen synthase kinase-3 by lithium correlates with reduced tauopathy and degeneration in vivo. *Proc Natl Acad Sci U S A*. 2005 May 10;102(19):6990-5.
13. Pan Y, Short JL, Newman SA, et al. Cognitive benefits of lithium chloride in APP/PS1 mice are associated with enhanced brain clearance of beta-amyloid. *Brain Behav Immun*. 2018 May;70:36-47.
14. Liu M, Qian T, Zhou W, et al. Beneficial effects of low-dose lithium on cognitive ability and pathological alteration of Alzheimer's disease transgenic mice model. *Neuroreport*. 2020 Sep 9;31(13):943-51.
15. Forlenza OV, de Paula VJ, Machado-Vieira R, et al. Does lithium prevent Alzheimer's disease? *Drugs Aging*. 2012 May 1;29(5):335-42.
16. Hajek T, Weiner MW. Neuroprotective Effects of Lithium in Human Brain? Food for Thought. *Curr Alzheimer Res*. 2016;13(8):862-72.
17. Szaniszló P, German P, Hajas G, et al. New insights into clinical trial for Colostrin in Alzheimer's disease. *J Nutr Health Aging*. 2009 Mar;13(3):235-41.
18. Boldogh I, Kruzell ML. Colostrin: an oxidative stress modulator for prevention and treatment of age-related disorders. *J Alzheimers Dis*. 2008 Apr;13(3):303-21.
19. Janusz M, Zablocka A. Colostrin: a proline-rich polypeptide complex of potential therapeutic interest. *Cell Mol Biol (Noisy-le-grand)*. 2013 Nov 3;59(1):4-11.
20. Boldogh I, Aguilera L, German P, et al. Colostrin increases the lifespan and neurological performance in senescence accelerated mice. *Neurodegenerative Dis*. 2007;4:264.
21. Pangman VC, Sloan J, Guse L. An examination of psychometric properties of the mini-mental state examination and the standardized mini-mental state examination: implications for clinical practice. *Appl Nurs Res*. 2000 Nov;13(4):209-13.



EASY WAY TO GET YOUR D AND K (plus Iodine)



Just one capsule daily provides:

Vitamin D3	125 mcg (5,000 IU)
Vitamin K1	1,000 mcg
Vitamin K2 (MK4)	1,000 mcg
Vitamin K2 (MK7)	100 mcg
Iodine	1,000 mcg

Vitamins **D** and **K** as well as **Iodine** perform multiple functions for heart, bone and thyroid health.

Life Extension® brings these three nutrients together in one convenient capsule.

SUPER SALE PRICE

Item #02040 • 60 capsules

1 bottle **\$16.20**

4 bottles \$14.85 each



For full product description and to order **Vitamins D and K with Sea-Iodine™**, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: Individuals consuming more than 50 mcg 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 250 mcg per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels. If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner. If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking this product.

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

THREE WAYS
TO BUILD
STRONGER
BONES

CUSTOMIZE YOUR BONE-HEALTH PROGRAM

Bone Restore helps maintain healthy bone density with three different forms of **calcium** plus vitamin D3 and magnesium, boron, zinc, manganese, and silicon.

Bone Restore with Vitamin K2, same formula as Bone Restore plus **200 mcg** of vitamin K2.

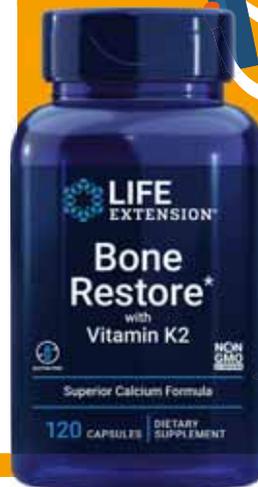
Bone Restore Elite, same formula as Bone Restore plus **45,000 mcg** of vitamin K2.



Bone Restore
SUPER SALE PRICE

Item #01726 • 120 capsules

1 bottle **\$14.85** • 4 bottles \$12.83 each



Bone Restore with Vitamin K2*
SUPER SALE PRICE

Item #01727 • 120 capsules

1 bottle **\$16.20** • 4 bottles \$14.85 each



Bone Restore Elite with Super Potent K2*
SUPER SALE PRICE

Item #02416 • 120 capsules

1 bottle **\$31.05** • 4 bottles \$28.35 each

For full product description and to order all **BONE RESTORE** products,
call **1-800-544-4440** or visit www.LifeExtension.com

* **CAUTION:** If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking this product.

Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. Patent No. 5,962,049.



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.

Your Best Memories Are in Front of You

Dancing. Laughing. Smiling. These are your special moments ... and they should be memories you will cherish for many years to come.

Memory Protect is our most advanced memory and brain health supplement ever. It combines colostrinin, a milk peptide, with the trace mineral lithium for unrivaled memory and cognitive health support for your brain.

So live life your way. We'll help you safeguard those precious moments with Memory Protect!



SUPER SALE PRICE

Item #02101 • 36 vegetarian capsules

1 box **\$16.20** • 4 boxes \$14.40 each

36-DAY SUPPLY.

Contains milk.

For full product description and to order **Memory Protect**,
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.

FAST RELIEF for **Acute** **Pain**





BY MARSHA MCCULLOCH, MS, RD

Scientists have identified three plant extracts that work together to relieve musculoskeletal pain:

- **Turmeric extract,**
- ***Boswellia serrata* extract, and**
- **Black sesame seed oil.**

In a **2020** human study, a combination of these extracts relieved acute musculoskeletal pain **as quickly and effectively as acetaminophen.**¹

This study showed this **herbal blend** to be **8.57 times better** than **acetaminophen** at relieving the emotional strain and unpleasantness of pain.

Acute Musculoskeletal Pain

Acute musculoskeletal pain refers to stiffness or aching in the muscles, bones, joints, ligaments, or tendons that develops suddenly and is caused by something specific.²

Causes may include falls, repetitive strain, incorrect posture, sudden exertion (like lifting something heavy), or simple wear and tear over time.³

People have turned to herbal remedies for pain relief since ancient times.

Modern science has now verified three plant extracts that effectively relieve musculoskeletal inflammation and pain:

- **Black sesame seeds** are rich in bioactive compounds, including **sesamin**, which has anti-inflammatory actions.^{1,4}
- **Turmeric** is a spice rich in **curcumin**, a compound known for its anti-inflammatory and free-radical-scavenging properties.^{5,6}
- ***Boswellia serrata*** is a tree resin long used as a traditional Ayurvedic pain remedy.⁷ Also known as **Indian frankincense**, it contains the anti-inflammatory compound **AKBA** (3-O-acetyl-11-keto-beta-boswellic acid).¹

Pain-Relieving Plants

Researchers have conducted **human studies** to individually evaluate turmeric, *Boswellia*, and black sesame seed for their pain-relief benefits.^{1,5,8}

In a meta-analysis of eight randomized controlled trials involving 606 patients, scientists found that **curcuminoids** from turmeric significantly reduced **pain severity** from a variety of causes, including arthritis and exercise-induced muscle soreness.⁶

A meta-analysis of seven trials involving 545 osteoarthritis patients showed that ***Boswellia serrata*** extract relieved **pain** and **stiffness** and improved **joint function** better than a placebo.⁸

In a controlled two-month trial of 50 patients (ages 50-70) with mild to moderate **knee osteoarthritis**, *black sesame seeds* significantly improved the **signs** and **symptoms** of knee pain. Scores on a standard test of **mobility** also significantly improved.⁹

Encouraged by these and other studies, scientists began testing a **combination** of the three plant extracts for acute pain.

In preclinical research, the three ingredients relieved acute pain and inflammation better **together** than the individual components did at a similar dosage.¹



Boswellia serrata



Turmeric



Black Sesame Seeds

Testing the Combination

People need pain relief **fast**. Scientists conducted the first randomized controlled human trial of a combination of **turmeric**, ***Boswellia serrata***, and **black sesame seed oil** extracts.¹

This study lasted **seven days**, and it was designed to determine if the herbal combination was as effective as the commonly used pain medication **acetaminophen**.

Researchers recruited 88 healthy men and women (ages 18-65) who had developed **acute musculo-skeletal pain** within the past 24 hours and hadn't taken any treatment.¹

People with arthritis or other **chronic** pain were excluded. In some cases, the pain was caused by musculoskeletal injuries, though in most of the cases it was simply described variously as muscle aches, neck pain, limb pain, low back pain, or joint pain.

Safe and Effective Pain Relief

- Over-the-counter pain medicines like **acetaminophen** and **ibuprofen** can harm vital organs.
- Scientists have identified **plant extracts** that can quickly and effectively relieve acute pain *without* unwanted side effects.
- **Turmeric**, ***Boswellia serrata***, and **black sesame seed oil** contain anti-inflammatory, pain-relieving compounds that are especially potent when combined.
- In healthy adults with **acute musculo-skeletal pain**, a proprietary blend of these three plants was as **fast and effective as acetaminophen** at relieving pain.
- The herbal blend was **8.57 times better** than acetaminophen at relieving the **emotional** suffering of acute pain.

WHAT
YOU
NEED
TO
KNOW



At the start of the study, subjects rated their pain intensity on a scale from **0** (no pain) to **10** (the worst pain imaginable).

All participants started with a “**distressing**” level of pain that was **5 or above**. That reflects a level they couldn't stop thinking about and that interfered with their daily activities.

The treatment group received **1,000 mg** of the proprietary **herbal blend** daily for **one week**. The control group received **1,000 mg** of **acetaminophen** daily.

The **plant extract combination** worked **as fast** and **as effectively** as **acetaminophen** in relieving acute pain, starting on day one!



Fast-Acting Relief

In the study, the herbal blend and the acetaminophen groups followed a similar time course for reducing pain.¹

Using validated questionnaires, subjects rated their level of pain intensity and pain relief every 30 minutes for up to six hours after taking their first dose of the assigned treatment.

The group taking the proprietary plant extracts began to feel pain relief as soon as **one hour** after the initial treatment. This was similar to the onset of pain relief in the acetaminophen group.

Subjects started to report **pain relief** within about **2.5 hours** in both groups. **Meaningful pain relief** (a **30%** pain score reduction per hour from baseline) was achieved within about **4.5 hours** in both groups, on average.

The pain reduction continued similarly in both groups over the course of the study, as assessed on the **third** and **seventh** day.

Reduced Pain Intensity

In this study, the proprietary **herbal combination** and **acetaminophen** groups also experienced a similar reduction in **pain intensity**.

Both acetaminophen and the plant extract combination achieved this result. Compared to baseline, **66%** of subjects in the herbal group achieved **at least 50% pain relief** within six hours on the first day of treatment, which was similar to the **acetaminophen** group.¹

Based on the degree of pain relief in the study, about **73%** of subjects in the proprietary **herbal combination** group were considered **positive responders** to the treatment, which was similar to that of the **acetaminophen** group.

What stands out about this human trial is that acetaminophen is a toxic drug that can acutely kill when combined with alcoholic beverages. Its destructive effects are too long to list but include kidney and liver failure in long-term users.¹⁰⁻¹³

Yet there are few warning labels on acetaminophen drugs and those who suffer acute or chronic pain often take large doses of acetaminophen not realizing it generates tissue-damaging free radicals.

Superior To Medication

Pain is more than just a *physical* experience. It also causes **emotional strain**.¹⁴

In this study, the short-form **McGill Pain Questionnaire** was used to evaluate the physical *and* emotional experience of pain on days **one**, **three**, and **seven** of the study.¹

The questionnaire asks subjects to evaluate their pain experience on a scale of **0** (none) to **3** (severe) in terms of 15 descriptive words in two categories:¹⁵

- **Sensory (physical):** throbbing, shooting, stabbing, sharp, cramping, gnawing, hot-burning, aching, heavy, tender, and splitting.
- **Affective (emotional):** tiring-exhausting, sickening, fearful, and punishing-cruel.

Both groups in the study experienced equivalent **physical** pain relief, according to the McGill score.

But the **plant extract** combination was **8.57 times better** than **acetaminophen** at relieving the **emotional distress** and unpleasantness of acute pain.¹

How It Works

Researchers chose the **turmeric**, **Boswellia**, and **sesame seed extracts** based on their previous history of effective pain relief, as well as their mechanisms of action.

Curcumin in turmeric and **AKBA** in *Boswellia* both inhibit **5-lipoxygenase (5-LOX)**.

5-LOX is the key *enzyme* that converts the omega-6 fatty acid **arachidonic acid** into proinflammatory **leukotrienes**.¹

Curcumin also indirectly inhibits **cyclooxygenase-2 (COX-2)**, an enzyme that promotes the production of inflammatory **prostaglandins**.

Black sesame seed oil works to inhibit **delta-5-desaturase**, an enzyme that produces arachidonic acid from omega-6 fats.¹ That decreases the amount of arachidonic acid *available* to make inflammatory cytokines in the first place.

The herbal combination was better at reducing pain and inflammation compared with each individual component when tested in animals. The combination inhibits multiple pro-inflammatory pathways in the body that produce **prostaglandins** and **leukotrienes**. These are the two main inflammatory facilitators that can trigger pain symptoms.

The **sesamin** in sesame oil may also promote the body's **absorption** of the other pain-relieving components in the blend.¹

Free From Side Effects

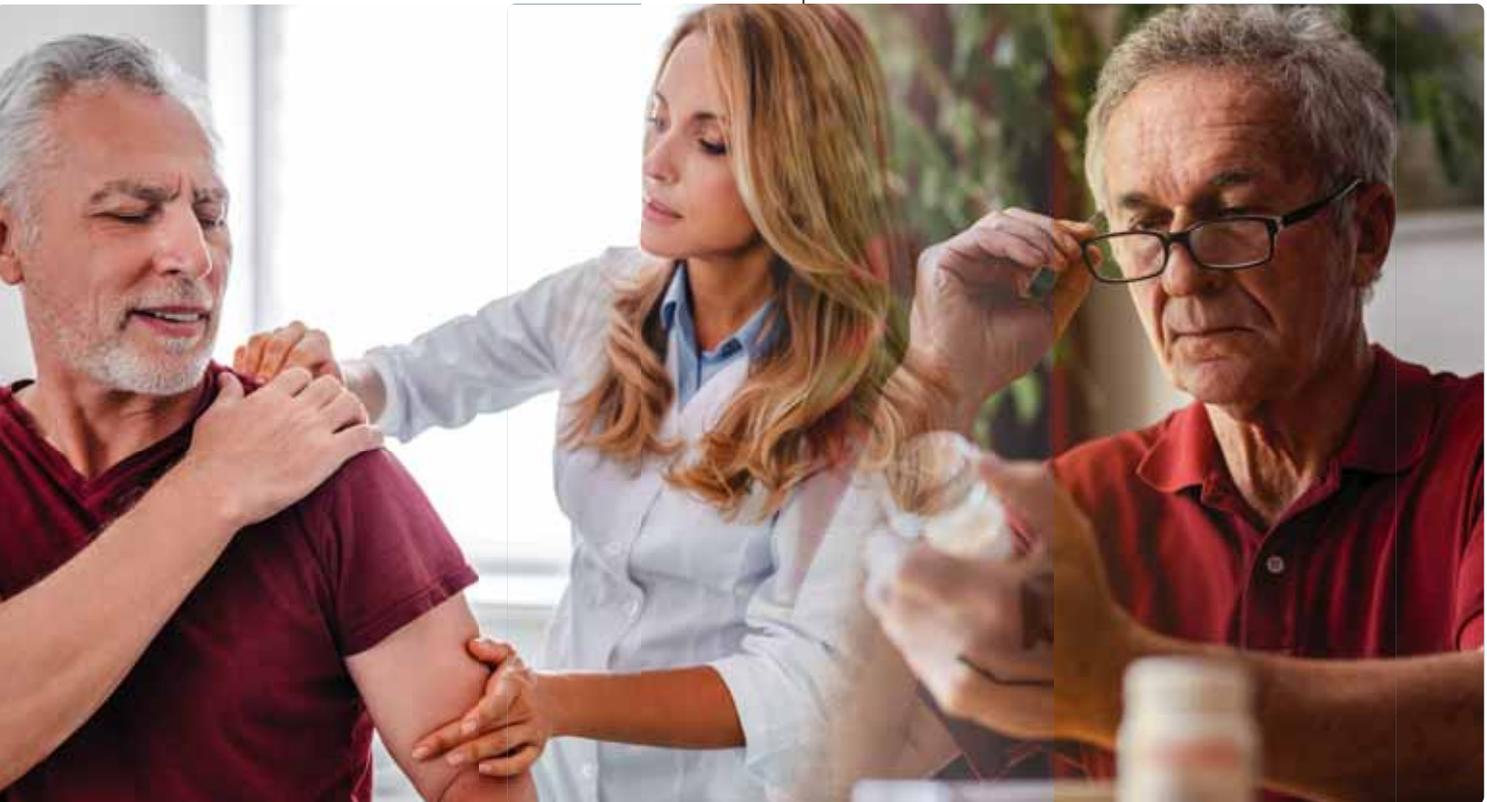
The use of **acetaminophen** and **non-steroidal anti-inflammatory drugs (NSAIDs)** like aspirin and ibuprofen has been associated with adverse effects.

For example, NSAIDs use can affect the gastric mucosa, the cardiovascular, hepatic, hematologic (blood), and renal systems.¹⁶

The best-known danger of acetaminophen is the potential for **acute liver damage**.¹⁷ It is also extremely easy to **overuse** because it comes in many over-the-counter and prescription medications, including some used for coughs and colds.¹⁸ Long-term use increases risk of kidney cancer and organ damage.¹⁹⁻²¹

In the study that used the proprietary plant extract blend, **"There was no adverse event reported by any subject in the study."**¹

The combination of **turmeric**, **Boswellia**, and **black sesame seed oil** extracts provides a plant-based option for rapid pain relief.



Summary

People reach for acetaminophen or NSAIDs like ibuprofen to treat acute aches and pains.

These painkillers carry the risk of harmful side effects.

A controlled clinical study has shown that a combination of **turmeric**, ***Boswellia serrata***, and **black sesame seed oil** extracts is **as fast and effective** as a standard dose of **acetaminophen** for reducing acute pain in healthy adults.

This proprietary herbal blend was **superior** to **acetaminophen** for relieving the emotional strain and unpleasantness aspects of pain. ●

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



References

1. Rudrappa GH, Chakravarthi PT, Benny IR. Efficacy of high-dissolution turmeric-sesame formulation for pain relief in adult subjects with acute musculoskeletal pain compared to acetaminophen: A randomized controlled study. *Medicine (Baltimore)*. 2020 Jul 10;99(28):e20373.
2. Available at: <https://my.clevelandclinic.org/health/diseases/14526-musculoskeletal-pain>. Accessed October 11, 2021.
3. El-Tallawy SN, Nalamasu R, Salem GI, et al. Management of Musculoskeletal Pain: An Update with Emphasis on Chronic Musculoskeletal Pain. *Pain Ther*. 2021 Jun;10(1):181-209.
4. Zhou L, Lin X, Abbasi AM, et al. Phytochemical Contents and Antioxidant and Antiproliferative Activities of Selected Black and White Sesame Seeds. *Biomed Res Int*. 2016;2016:8495630.
5. Paultre K, Cade W, Hernandez D, et al. Therapeutic effects of turmeric or curcumin extract on pain and function for individuals with knee osteoarthritis: a systematic review. *BMJ Open Sport Exerc Med*. 2021;7(1):e000935.
6. Sahebkar A, Henrotin Y. Analgesic Efficacy and Safety of Curcuminoids in Clinical Practice: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Pain Med*. 2016 Jun;17(6):1192-202.
7. Khan MA, Ali R, Parveen R, et al. Pharmacological evidences for cytotoxic and antitumor properties of Boswellic acids from *Boswellia serrata*. *J Ethnopharmacol*. 2016 Sep 15;191:315-23.
8. Yu G, Xiang W, Zhang T, et al. Effectiveness of *Boswellia* and *Boswellia* extract for osteoarthritis patients: a systematic review and meta-analysis. *BMC Complement Med Ther*. 2020 Jul 17;20(1):225.
9. Eftekhar Sadat B, Khadem Haghighian M, Alipoor B, et al. Effects of sesame seed supplementation on clinical signs and symptoms in patients with knee osteoarthritis. *Int J Rheum Dis*. 2013 Oct;16(5):578-82.
10. Moore N, Scheiman JM. Gastrointestinal safety and tolerability of oral non-aspirin over-the-counter analgesics. *Postgrad Med*. 2018 Mar;130(2):188-99.
11. Keen MU, Aeddula NR. Analgesic Nephropathy. *StatPearls*. Treasure Island (FL)2021.
12. Available at: <https://www.raps.org/regulatory-focus/news-articles/2015/11/fda-amends-liver-warning-labeling-guidance-for-some-otc-drugs-containing-acetaminophen>. Accessed October 14, 2021.
13. Zimmerman HJ, Maddrey WC. Acetaminophen (paracetamol) hepatotoxicity with regular intake of alcohol: analysis of instances of therapeutic misadventure. *Hepatology*. 1995 Sep;22(3):767-73.
14. Talbot K, Madden VJ, Jones SL, et al. The sensory and affective components of pain: are they differentially modifiable dimensions or inseparable aspects of a unitary experience? A systematic review. *Br J Anaesth*. 2019 Aug;123(2):e263-e72.
15. Melzack R. The short-form McGill Pain Questionnaire. *Pain*. 1987 Aug;30(2):191-7.
16. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK547742/>. Accessed October 13, 2021.
17. Freo U, Ruocco C, Valerio A, et al. Paracetamol: A Review of Guideline Recommendations. *J Clin Med*. 2021 Jul 31;10(15).
18. Agrawal S, Khazaeni B. Acetaminophen Toxicity. *StatPearls*. Treasure Island (FL)2021.
19. Kanchanasurakit S, Arsu A, Siriplabpla W, et al. Acetaminophen use and risk of renal impairment: A systematic review and meta-analysis. *Kidney Res Clin Pract*. 2020 Mar 31;39(1):81-92.
20. Choueiri TK, Je Y, Cho E. Analgesic use and the risk of kidney cancer: a meta-analysis of epidemiologic studies. *Int J Cancer*. 2014 Jan 15;134(2):384-96.
21. Jones GR. The Alzheimer pandemic: is paracetamol to blame? *Inflamm Allergy Drug Targets*. 2014 Feb;13(1):2-14.

PROSTATE HEALTH

The best way to keep
You in the picture.

Ultra Prostate Formula was created to help maintain prostate health. It contains a dozen ingredients to:

- Support healthy urination
- Promote healthy prostate function
- Support healthy prostate cell division

Ultra Prostate Formula is the most comprehensive *standardized-ingredient* prostate-health supplement.



SUPER SALE PRICE

Item #02029 • 60 softgels

1 bottle \$25.65 • 4 bottles \$23.63 each

AprèsFlex® is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas-Laila Nutra LLC. HMRlignan™ is a trademark used under sublicense from Linnea S.A. Lyc-O-Mato® is a registered trademark of Lycored Corp. Albion® is a registered trademark of Albion Laboratories, Inc. Graminex® is a registered trademark of Graminex LLC.



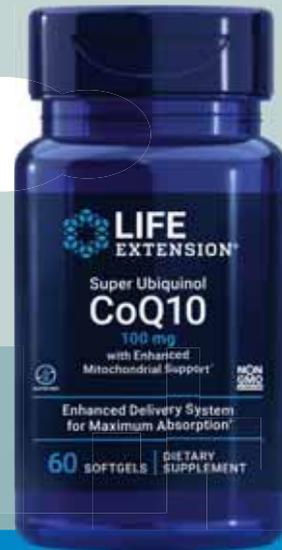
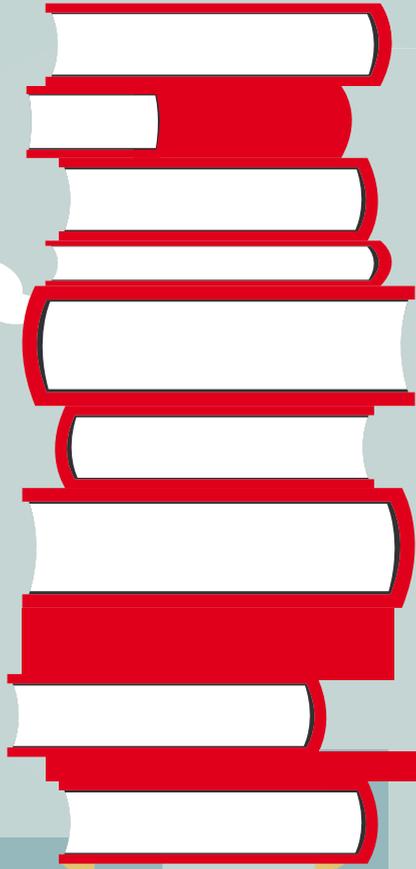
For full product description and to order
Ultra Prostate Formula, call **1-800-544-4440**
or visit www.LifeExtension.com

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.

CoQ10

Fuel for Heart | Mind | Muscle

Educated consumers often choose the **ubiquinol** form of **CoQ10** because of studies showing it *absorbs* up to **8-times** better!



SUPER SALE PRICE

Item #01426 • 100 mg, 60 softgels

1 bottle \$41.85 • 4 bottles \$35.10 each



For full product description and to order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™**, call **1-800-544-4440** or visit **www.LifeExtension.com**

PrimaVie® is a registered trademark of Natreon, Inc. Q+®, Kaneka Ubiquinol™, and the quality seal™ are registered or pending trademarks of Kaneka Corp.

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.

FAST ACTING RELIEF

**WORKS
ON DAY
ONE!**



SUPER SALE PRICE

Item #02430 • 60 softgels

1 bottle \$21.60 • 4 bottles \$19.80 each



Clinically studied **plant extracts** can safely relieve occasional minor soreness of muscles and joints.*

Fast Acting Relief delivers a blend of three **plant extracts**—**turmeric**, ***Boswellia serrata***, and **black sesame seed**—which work together to promote a healthy inflammatory response and support comfortable joints.

FOR FULL PRODUCT DESCRIPTION AND TO ORDER **FAST ACTING RELIEF**, CALL **1-800-544-4440** OR VISIT **WWW.LIFEEXTENSION.COM**

Rhuleave-K™ is a trademark of Arjuna Natural LLC.

* Medicine (Baltimore). 2020;99(28):e20373.

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





A Probiotic That *Lowers* Cholesterol

BY MICHAEL DOWNEY

Over **35 million** Americans take **statin drugs** to reduce their **cholesterol**.¹

Yet some people are *still* unable get their cholesterol under control,² and heart disease remains the **leading killer** of Americans.³

Science has found a novel way to help reduce cholesterol.

Probiotics are beneficial bacteria that can help keep the microorganisms in your gut balanced.

Clinical research has revealed that a specific **probiotic strain** lowers **LDL (“bad”) cholesterol** and **total cholesterol**.^{2,4}

In just nine weeks, daily intake of this **probiotic**:²

- Lowered **LDL** cholesterol by nearly **12%**,
- Lowered **total** cholesterol by more than **9%**, and
- Lowered the ratio of **LDL (“bad”) to HDL (“good”) cholesterol** by more than **13%**.

Using a **probiotic** to reduce cholesterol can be beneficial to those who are challenged to tolerate high-dose statins, as well as those who are unable to manage their cholesterol through diet and lifestyle.

Life Extension encourages most individuals to maintain **LDL cholesterol** levels less than **80 mg/dL** and to take other actions, like lowering **homocysteine** and **glucose**, to help reduce risk of heart attack and stroke.

Individuals with preexisting conditions or at high risk for cardiovascular disease should aim for even lower levels of less than **70 mg/dL**.

The Importance of Gut Bacteria

It may sound surprising that bacteria in the gut can lower **cholesterol**.

But in recent years, research has shown that the **gut microbiome** plays a key role in maintaining optimal health throughout the body.

An **imbalance** in the types of bacteria and other microorganisms that make up our gut flora are strongly associated with the development of a host of diseases.^{5,6}

Research has shown that different **probiotics** can safely promote digestive, immune, and oral health. This field has now emerged as an important strategy for reducing the risk of **cardiovascular disease**.^{7,8}

Scientists have shown that the probiotic strain ***Lactobacillus reuteri* NCIMB 30242** has the ability to safely **reduce cholesterol** levels. It does so by:^{9,10}

- Increasing cholesterol *removal* from the body, into the stool, and
- Increasing the *metabolism* (breakdown) of cholesterol in the liver.



Lowering Cholesterol in Human Studies

Researchers enlisted adults with **high cholesterol**. Some consumed regular **yogurt**, while others consumed yogurt with the probiotic strain ***L. reuteri* NCIMB 30242**.

After **six weeks**, the volunteers taking *L. reuteri* **NCIMB 30242** had:⁴

- A nearly **5%** reduction in **total** cholesterol,
- A nearly **9%** reduction in **LDL** cholesterol, and
- Significant reductions in concentration of **apolipoprotein B (apoB)**, a marker of LDL particle numbers and a known **risk factor** for cardiovascular disease.¹¹⁻¹³

In another randomized, controlled trial of adults with high cholesterol, **nine weeks** of taking ***L. reuteri* NCIMB 30242 capsules** resulted in:^{7,2}

- A nearly **12%** reduction in **LDL** cholesterol,
- A greater than **9.1%** reduction in **total** cholesterol,
- A greater than **8.4%** reduction in **apoB-100**, and
- A **13.4%** reduction in the **LDL-to-HDL** cholesterol ratio.

Benefits Beyond Cholesterol

The nine-week study also showed that *L. reuteri* NCIMB 30242 intake reduced levels of **C-reactive protein** and **fibrinogen**.²

C-reactive protein is a marker of inflammation that is often used to evaluate the risk of developing **coronary artery disease**, the most common cause of heart attacks.¹⁴

Fibrinogen is a protein produced by the liver that promotes **clotting**. High levels are associated with an increased risk of harmful clots, heart disease, and strokes.¹⁵⁻¹⁸

The **high-cholesterol** volunteers who took *L. reuteri* NCIMB 30242 were found to have:²

- **62%** reductions (or reductions of **1.05 mg/L**) in C-reactive protein (CRP), and
- **14%** reductions in fibrinogen.


 WHAT YOU NEED TO KNOW

Protect the Heart with a Probiotic

In patients who began the study with average or high-risk CRP:²

- **27.1%** of those taking *L. reuteri* NCIMB 30242 reduced their risk by **one or more** categories (from high to average risk, for example, or from high to low risk), compared to just **1.7%** of control subjects, and
- **22%** of the *L. reuteri* NCIMB 30242 group decreased their **CRP** risk by **one** category, compared to just **2%** of controls.

Beyond these heart-health benefits, *L. reuteri* NCIMB 30242 has been shown to:

- Increase circulating **bile acid** levels, which may help prevent various chronic diseases,^{2,19}
- Boost **vitamin D** levels by more than **25%**, potentially *further* reducing the risk of cardiovascular and other diseases,²⁰ and
- Significantly improve **diarrhea** symptoms and scores in **gastrointestinal health** surveys.²¹

- **Cardiovascular disease** is the leading cause of death for adults in America, partially driven by high levels of **LDL (“bad”) cholesterol** and **total cholesterol**.
- **Statins** lower LDL cholesterol, but they produce some side effects that that may cause some people to stop taking the drugs.
- Human studies show that the probiotic strain *L. reuteri* NCIMB 30242 has the ability to lower **total** cholesterol by more than **9%**, reduce **LDL** cholesterol by nearly **12%**, and significantly improve other cardiovascular risk factors.
- Shown to be safe and effective, *L. reuteri* NCIMB 30242 helps lower high or even normal cholesterol levels.
- Blood tests should be used to measure cardiovascular risk factors like **LDL** to ensure optimal levels (under 80 mg/dL) are being achieved.



How *L. Reuteri* NCIMB 30242 Works

One of the main functions of the gallbladder is to release a fluid called **bile**. Bile breaks down fats and oils in the intestinal tract, making cholesterol available for digestion.

This is important, because cholesterol is needed by the body to form cell membranes, create hormones, and perform other functions.

But cholesterol levels can become too high due to excess dietary intake, excess cholesterol release from the liver, or genetic predisposition. *Higher* blood levels of cholesterol raise the risk of **cardiovascular disease**.^{13,22}

The probiotic strain *L. reuteri* NCIMB 30242 can produce an enzyme called **bile salt hydrolase**. This enzyme breaks certain chemical bonds of cholesterol and bile acids. This makes cholesterol less water-soluble and **less absorbable**.²³

As a result, instead of entering the bloodstream (and then the walls of arteries), excess cholesterol becomes trapped in the gut. It is eventually excreted from the body in feces, **reducing cholesterol levels** in the blood.²³

L. reuteri NCIMB 30242 may provide a second mechanism for cholesterol reduction.

When the *enzyme* released by this probiotic strain helps break down cholesterol, the resulting bile acids

act as potent signaling molecules. These molecules regulate **cholesterol metabolism**, accelerating the breakdown and excretion of cholesterol.²⁴⁻²⁷

The end result is that *L. reuteri* NCIMB 30242 reduces total and LDL cholesterol levels.

Proven Safety

Many bacteria of the *Lactobacillus* family are classed as GRAS, or “generally recognized as safe,” by the U.S. Food and Drug Administration.

Lactobacillus reuteri NCIMB 30242, in particular, has undergone extensive laboratory characterization and safety testing.

L. reuteri NCIMB 30242 has demonstrated **no adverse effects** associated with its consumption.^{28,29}

It is a safe and effective way to reduce cholesterol and lower risk of heart disease.

Summary

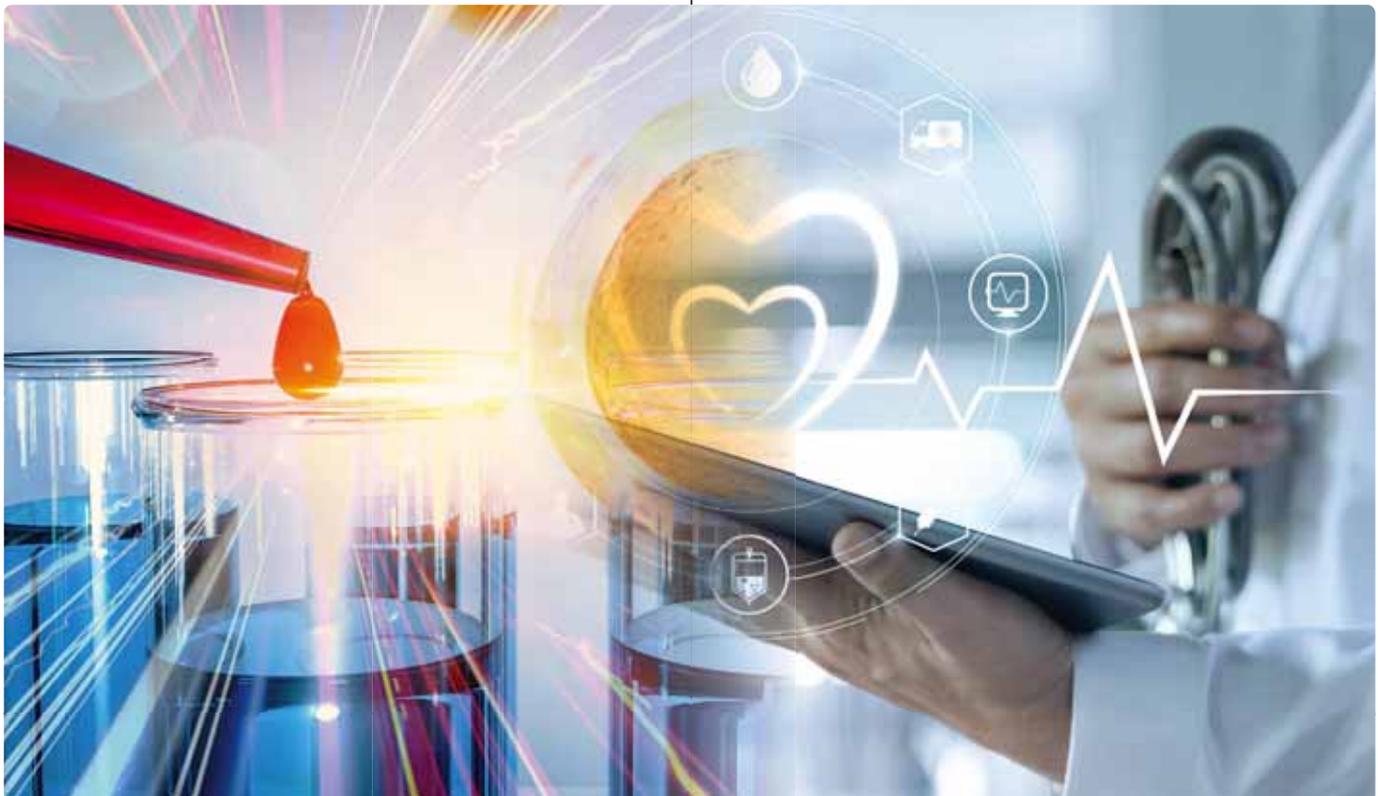
With advancing age, virtually every American is at risk for **atherosclerotic** disorders.

Clinical evidence shows that the probiotic strain ***L. reuteri* NCIMB 30242** has the ability to lower **total cholesterol** by more than **9%** and high-risk **LDL** cholesterol by almost **12%**, while improving other cardiovascular risk factors like elevated **C-reactive protein**. •

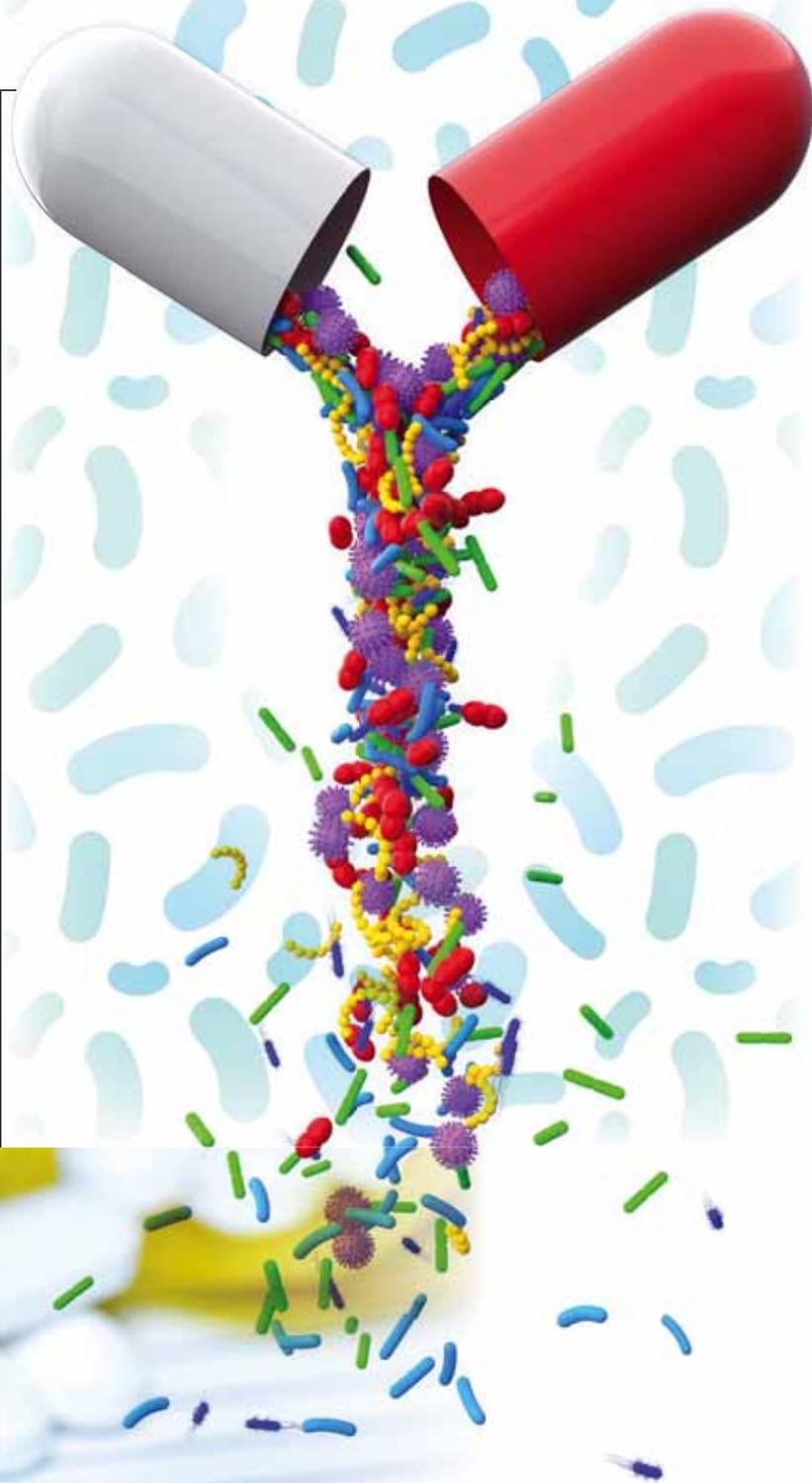
If you have any questions on the scientific content of this article, please call a **Life Extension Wellness Specialist** at 1-866-864-3027.

References

1. Medicine JH. Statins starve cancer cells to death. *ScienceDaily*. 2020.
2. Jones ML, Martoni CJ, Prakash S. Cholesterol lowering and inhibition of sterol absorption by *Lactobacillus reuteri* NCIMB 30242: a randomized controlled trial. *Eur J Clin Nutr*. 2012 Nov;66(11):1234-41.
3. Available at: <https://www.cdc.gov/heartdisease/facts.htm>. Accessed October 26, 2021.
4. Jones ML, Martoni CJ, Parent M, et al. Cholesterol-lowering efficacy of a microencapsulated bile salt hydrolase-active *Lactobacillus reuteri* NCIMB 30242 yoghurt formulation in hypercholesterolaemic adults. *Br J Nutr*. 2012 May;107(10):1505-13.
5. Kovatcheva-Datchary P, Arora T. Nutrition, the gut microbiome and the metabolic syndrome. *Best Pract Res Clin Gastroenterol*. 2013 Feb;27(1):59-72.
6. DiRienzo DB. Effect of probiotics on biomarkers of cardiovascular disease: implications for heart-healthy diets. *Nutr Rev*. 2014 Jan;72(1):18-29.
7. Vindigni SM, Broussard EK, Surawicz CM. Alteration of the intestinal microbiome: fecal microbiota transplant and probiotics for *Clostridium difficile* and beyond. *Expert Rev Gastroenterol Hepatol*. 2013 Sep;7(7):615-28.
8. Ebel B, Lemetais G, Beney L, et al. Impact of probiotics on risk factors for cardiovascular diseases. A review. *Crit Rev Food Sci Nutr*. 2014;54(2):175-89.
9. Tuohy KM, Fava F, Viola R. 'The way to a man's heart is through his gut microbiota'--dietary pro- and prebiotics for the management of cardiovascular risk. *Proc Nutr Soc*. 2014 May;73(2):172-85.
10. Jones ML, Tomaro-Duchesneau C, Martoni CJ, et al. Cholesterol lowering with bile salt hydrolase-active probiotic bacteria, mechanism of action, clinical evidence, and future direction for heart health applications. *Expert Opin Biol Ther*. 2013 May;13(5):631-42.
11. Davidson MH, Ballantyne CM, Jacobson TA, et al. Clinical utility of inflammatory markers and advanced lipoprotein testing: advice from an expert panel of lipid specialists. *J Clin Lipidol*. 2011 Sep-Oct;5(5):338-67.
12. AMPLION. biomarker: Apo B. *biomarkerbase by amplion*. 2018.
13. Imes CC, Austin MA. Low-density lipoprotein cholesterol, apolipoprotein B, and risk of coronary heart disease: from familial hyperlipidemia to genomics. *Biol Res Nurs*. 2013 Jul;15(3):292-308.
14. Jialal I, Devaraj S. Inflammation and atherosclerosis: the value of the high-sensitivity C-reactive protein assay as a risk marker. *Am J Clin Pathol*. 2001 Dec;116 Suppl:S108-15.
15. Fibrinogen Studies C, Danesh J, Lewington S, et al. Plasma fibrinogen level and the risk of major cardiovascular diseases and nonvascular mortality: an individual participant meta-analysis. *JAMA*. 2005 Oct 12;294(14):1799-809.
16. Scarabin PY, Aillaud MF, Amouyel P, et al. Associations of fibrinogen, factor VII and PAI-1 with baseline findings among 10,500 male participants in a prospective study of myocardial infarction--the PRIME Study. *Prospective Epidemiological Study of Myocardial Infarction. Thromb Haemost*. 1998 Nov;80(5):749-56.
17. Wilhelmsen L, Svardsudd K, Korsan-Bengtsson K, et al. Fibrinogen as a risk factor for stroke and myocardial infarction. *N Engl J Med*. 1984 Aug 23;311(8):501-5.
18. Available at: <https://www.iosrjournals.org/iosr-jpbs/papers/Vol10-issue3/Version-2/O010329198.pdf>. Accessed October 25, 2021.



19. Martoni CJ, Labbe A, Ganopolsky JG, et al. Changes in bile acids, FGF-19 and sterol absorption in response to bile salt hydrolase active *L. reuteri* NCIMB 30242. *Gut Microbes*. 2015;6(1):57-65.
20. Jones ML, Martoni CJ, Prakash S. Oral supplementation with probiotic *L. reuteri* NCIMB 30242 increases mean circulating 25-hydroxyvitamin D: a post hoc analysis of a randomized controlled trial. *J Clin Endocrinol Metab*. 2013 Jul;98(7):2944-51.
21. Jones ML, Martoni CJ, Ganopolsky JG, et al. Improvement of gastrointestinal health status in subjects consuming *Lactobacillus reuteri* NCIMB 30242 capsules: a post-hoc analysis of a randomized controlled trial. *Expert Opin Biol Ther*. 2013 Dec;13(12):1643-51.
22. Yu XH, Qian K, Jiang N, et al. ABCG5/ABCG8 in cholesterol excretion and atherosclerosis. *Clin Chim Acta*. 2014 Jan 20;428:82-8.
23. Ramasamy K, Abdullah N, Wong MC, et al. Bile salt deconjugation and cholesterol removal from media by *Lactobacillus* strains used as probiotics in chickens. *J Sci Food Agric*. 2010 Jan 15;90(1):65-9.
24. Sayin SI, Wahlstrom A, Felin J, et al. Gut microbiota regulates bile acid metabolism by reducing the levels of tauro-beta-muricholic acid, a naturally occurring FXR antagonist. *Cell Metab*. 2013 Feb 5;17(2):225-35.
25. Zhou H, Hylemon PB. Bile acids are nutrient signaling hormones. *Steroids*. 2014 Aug;86:62-8.
26. Qi Y, Jiang C, Cheng J, et al. Bile acid signaling in lipid metabolism: metabolomic and lipidomic analysis of lipid and bile acid markers linked to anti-obesity and anti-diabetes in mice. *Biochim Biophys Acta*. 2015 Jan;1851(1):19-29.
27. Li T, Chiang JY. Regulation of bile acid and cholesterol metabolism by PPARs. *PPAR Res*. 2009 2009/07/14;2009:501739.
28. Jones ML, Martoni CJ, Tamber S, et al. Evaluation of safety and tolerance of microencapsulated *Lactobacillus reuteri* NCIMB 30242 in a yogurt formulation: a randomized, placebo-controlled, double-blind study. *Food Chem Toxicol*. 2012 Jun;50(6):2216-23.
29. Jones ML, Martoni CJ, Di Pietro E, et al. Evaluation of clinical safety and tolerance of a *Lactobacillus reuteri* NCIMB 30242 supplement capsule: a randomized control trial. *Regul Toxicol Pharmacol*. 2012 Jul;63(2):313-20.



Total Cholesterol:	Goal < 200
HDL "good" Cholesterol:	Goal > 40
LDL "bad" Cholesterol:	Goal < 100, ~
Triglycerides:	Goal < 150

Better Together



The duo
that improves
the picture



Curcumin helps to promote a healthy inflammatory response.

Pro-Resolving Mediators help remove cellular debris and build new, healthy tissue.

This complementary combo promotes a healthy inflammatory response.

Curcumin Elite™

SUPER SALE PRICE

Item #02407 • 60 500 mg vegetarian capsules

1 bottle **\$21.60** | 4 bottles \$19.80 each



Pro-Resolving Mediators

SUPER SALE PRICE

Item #02223 • 30 softgels

1 bottle **\$18.90** | 4 bottles \$17.10 each

Want to Save More? Buy together for lowest possible price!

For full product description and to order **Curcumin Elite™** and **Pro-Resolving Mediators**, 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.

Maintain Endothelial Plaque Stability with **ARTERIAL PROTECT**



ARTERIAL PROTECT can help stabilize endothelial plaque and promote healthy blood flow throughout the body.*

Just one capsule a day provides the patented French Maritime **pine bark extract** used in clinical studies along with **Gotu Kola**.

SUPER SALE PRICE

Item #02004 • 30 vegetarian capsules

1 bottle **\$29.70**

4 bottles \$26.10 each

* *Int Angiol.* 2014 Feb;33(1):20-6.

Pycnogenol® and Centellicum® are registered trademarks of Horphag Research and the use of this product is protected by international patents.



For full product description and to order **Arterial Protect**, 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.

PROBIOTIC FOR HEART HEALTH



SUPER SALE PRICE

Item #01821 • 60 vegetarian capsules
1 bottle \$21.60 • 4 bottles \$18.90 each



In clinical trials, the probiotic *Lactobacillus reuteri* NCIMB 30242 found in FlorAssist® Heart Health has been shown to support cholesterol levels already within normal range.^{1,2}

Additionally, *Lactobacillus reuteri* NCIMB 30242 supports healthy levels already within the normal range of:

- C-reactive protein
- Apolipoprotein B
- Fibrinogen.³

For full product description and to order FlorAssist® Heart Health, call 1-800-544-4440 or visit www.LifeExtension.com

References

1. *Eur J Clin Nutr.* 2012 Nov;66(11):1234-41.
2. *Br J Nutr.* 2012 May;107(10):1505-13.
3. *Eur J Clin Nutr.* 2012 Nov;66(11):1234-41.

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.



MAGNESIUM

Mitigates Migraines



BY CHANCELLOR FALOON

Migraines are among the leading causes of disability worldwide.¹

Roughly **\$78 billion** is spent annually in medical costs for treatment.²

People who suffer from migraine commonly have low **magnesium** levels, especially during an attack.³⁻⁵

According to the **National Health and Nutrition Examination Survey**, about **48%** of Americans are not reaching their magnesium minimum daily requirements.⁶

Magnesium helps to reduce arrhythmia, heart disease, and stroke risks, and helps maintain better bone density.^{7,8} Over **300 enzymes** in the body rely on magnesium to function.⁹

New clinical trials have uncovered encouraging evidence for magnesium's role in reducing **migraine** headaches.

Magnesium vs Conventional Medication

Two clinical trials published in **2021** compared the effect of **magnesium** to that of different types of conventional migraine medications.

In the first study, people with frequent migraines were randomized to receive either **valproate sodium**, a drug used to prevent migraines or **500 mg** of oral **magnesium** every 12 hours for eight weeks.¹⁰

The number of migraine attacks, days, and the mean duration significantly decreased in both groups, leading the authors to conclude that magnesium “*appears to be effective in migraine prophylaxis similar to valproate sodium without significant adverse effect.*”

A second trial compared **intravenous magnesium** to two conventional *intravenous* migraine medications, **prochlorperazine** and **metoclopramide**.¹¹

This study evaluated 157 patients, most of them female, who had to visit an emergency department due to the severity of their migraines.

Results showed that **migraine pain** decreased in *all* groups after 60 minutes, with none of the treatments showing clear superiority over the others.

Women are disproportionately affected by migraines¹², and a new analysis of data suggests that increasing magnesium intake is particularly effective for treating migraines in women.¹³

A Successful Combined Approach

Preventing and treating migraines sometimes requires a multifaceted approach.

Several nutrients that work via different mechanisms have shown clinical benefits.

Riboflavin (vitamin B2) and **coenzyme Q10** have shown good results in people who suffer frequent migraines.

Riboflavin’s migraine benefits have been known for decades, and a comprehensive review of the medical literature concluded that **riboflavin** reduces **migraine frequency**.¹⁴

CoQ10 lowers levels of **calcitonin gene-related peptide**, which is a neuropeptide that causes the progression of migraines.^{15,16}

In a clinical trial of patients suffering three or more migraines a month, patients were randomized to receive either a placebo or an oral combination of **600 mg** magnesium, **400 mg** riboflavin, and **150 mg** CoQ10 daily along with a multivitamin with minerals for three months.¹⁷

Compared to those taking the **placebo**, patients receiving the **nutrient combination** reduced the number of days with migraines by almost two and had significantly **reduced intensity of migraine pain**.

Taken together, the data suggest that for many people, increasing **magnesium** intake could help prevent migraine attacks, and lessen their duration and severity.



WHAT
YOU
NEED
TO
KNOW

Summary

Migraines are debilitating headaches that can last up to **three days**.

Clinical trials have shown that **magnesium** can prevent and relieve migraines and is even more beneficial when combined with **riboflavin** and **CoQ10**.

Magnesium is one of the most important minerals in the human body, but almost half of all Americans are not getting enough.

Increasing magnesium intake may help many people prevent migraines and lessen their severity and duration. •

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

Migraine Relief at Last

- **Migraines** are severe, throbbing headaches that can last from a few hours to as long as three days.
- Oral **magnesium** has been shown to decrease the number of migraine attacks as well as their duration and severity.
- In two clinical trials, oral and intravenous magnesium were found to be as effective as different conventional migraine treatments.
- A combination of **magnesium, riboflavin** (vitamin B2) and **CoQ10** led to significantly decreased migraine pain intensity.

References

1. Available at: <https://migraineresearchfoundation.org/about-migraine/migraine-facts/>. Accessed October 15, 2021.
2. Gooch CL, Pracht E, Borenstein AR. The burden of neurological disease in the United States: A summary report and call to action. *Ann Neurol*. 2017 Apr;81(4):479-84.
3. Qujeq D, Zandemami M, Ahanger AA, et al. Evaluation of intracellular magnesium and calcium concentration in patients with migraine. *Neurosciences (Riyadh)*. 2012 Jan;17(1):85-6.
4. Talebi M, Savadi-Oskouei D, Farhoudi M, et al. Relation between serum magnesium level and migraine attacks. *Neurosciences (Riyadh)*. 2011 Oct;16(4):320-3.
5. Sun-Edelstein C, Mauskop A. Role of magnesium in the pathogenesis and treatment of migraine. *Expert Rev Neurother*. 2009 Mar;9(3):369-79.
6. Available at: https://www.ars.usda.gov/ARUserFiles/80400530/pdf/usual/Usual_Intake_gender_WWEIA_2013_2016.pdf. Accessed October 15, 2021.
7. DiNicolantonio JJ, Liu J, O'Keefe JH. Magnesium for the prevention and treatment of cardiovascular disease. *Open Heart*. 2018;5(2):e000775.
8. de Baaij JH, Hoenderop JG, Bindels RJ. Magnesium in man: implications for health and disease. *Physiol Rev*. 2015 Jan;95(1):1-46.
9. Available at: <https://ods.od.nih.gov/factsheets/Magnesium-Health-Professional/>. Accessed March 30, 2021.
10. Karimi N, Razian A, Heidari M. The efficacy of magnesium oxide and sodium valproate in prevention of migraine headache: a randomized, controlled, double-blind, crossover study. *Acta Neurol Belg*. 2021 Feb;121(1):167-73.
11. Kandil M, Jaber S, Desai D, et al. MAGGraine: Magnesium compared to conventional therapy for treatment of migraines. *Am J Emerg Med*. 2021 Jan;39:28-33.
12. Burch RC, Buse DC, Lipton RB. Migraine: Epidemiology, Burden, and Comorbidity. *Neurol Clin*. 2019 Nov;37(4):631-49.
13. Meng SH, Wang MX, Kang LX, et al. Dietary Intake of Calcium and Magnesium in Relation to Severe Headache or Migraine. *Front Nutr*. 2021 March-05;8(83):653765.
14. Thompson DF, Saluja HS. Prophylaxis of migraine headaches with riboflavin: A systematic review. *J Clin Pharm Ther*. 2017 Aug;42(4):394-403.
15. Dahri M, Tarighat-Esfanjani A, Asghari-Jafarabadi M, et al. Oral coenzyme Q10 supplementation in patients with migraine: Effects on clinical features and inflammatory markers. *Nutr Neurosci*. 2019 Sep;22(9):607-15.
16. Ho TW, Edvinsson L, Goadsby PJ. CGRP and its receptors provide new insights into migraine pathophysiology. *Nat Rev Neurol*. 2010 Oct;6(10):573-82.
17. Gaul C, Diener HC, Danesch U, et al. Improvement of migraine symptoms with a proprietary supplement containing riboflavin, magnesium and Q10: a randomized, placebo-controlled, double-blind, multicenter trial. *J Headache Pain*. 2015;16:516.





Liposomal-Hydrogel

C
VITAMIN

For full product description and to order **Vitamin C 24-Hour Liposomal Hydrogel™ Formula**, call **1-800-544-4440** or visit www.LifeExtension.com

Buffered **ascorbate** encased in two plant extracts (liposomes plus hydrogel fenugreek) increases blood (plasma) exposure nearly **seven times more** compared to an equivalent dose of regular vitamin C.

It also maintains *higher* vitamin levels throughout the day.¹

Just **one** vegetarian tablet daily provides **around-the-clock** vitamin C support.

SUPER SALE PRICE

Item #02501 • 60 vegetarian tablets

1 bottle **\$22.95** • 4 bottles \$20.70 each



1. Akay Internal Study. Liposomal hydrogel vitamin C pharmacokinetics. Data on file. 2021.



Positively Impact **HEALTHY** **METABOLISM** with Next-Generation **LIPOIC ACID**

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

Get powerful metabolic support to help reduce oxidative stress, body fat, and weight.



SUPER SALE PRICE

Item #01208 • 60 vegetarian capsules

1 bottle **\$33.08**

4 bottles \$30.38 each

Suggested dose is one to two capsules daily.

For full product description and to order **Super R-Lipoic Acid**, 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.
Individual results are not guaranteed, and results may vary.

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

Bio-Enhanced® is a registered trademark of GeroNova Research, Inc.

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.

Whole- Body Support

Everything good
takes time.

Magnesium is essential for a healthy heart and sturdy bones; it's even great for your mood. But, most of us don't get enough from our diets.

Our innovative formula delivers both immediate and extended-release magnesium, so you get the maximum benefits—for the long haul.



SUPER SALE PRICE

Item #02107

60 250 mg vegetarian capsules

1 bottle **\$8.78** • 4 bottles \$7.88 each

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

ZümXR® is a registered trademark and protected by patents. See www.ZümXR.com

For full product description and to order **Extend-Release Magnesium**, call **1-800-544-4440** or visit www.LifeExtension.com

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

ZINC

UP

YOUR IMMUNE HEALTH



SUPER SALE PRICE

Item #01813

50 mg • 90 vegetarian capsules

1 bottle **\$6.08** • 4 bottles \$5.40 each



OptiZinc® is a registered trademark of InterHealth Nutritionals, Inc.

You know zinc is good for you – but are you getting enough?

Zinc promotes critical **immune** functions and healthy **bones**.

This formula provides **50 mg** of zinc in a convenient, vegetarian capsule.

For full product description and to order **Zinc Caps** call **1-800-544-4440** or visit **www.LifeExtension.com**

Caution: Supplemental zinc can inhibit the absorption and availability of copper. If more than 50 mg of supplemental zinc is to be taken daily for more than four weeks, 2 mg of supplemental copper should also be taken to prevent copper deficiency.

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

The Mindspan Diet:

Reduce Alzheimer's Risk, Minimize Memory Loss,
and Keep Your Brain Young

BY PRESTON ESTEP III, PHD



Neurodegenerative disorders are on the rise in the U.S., Europe, and in most affluent nations of the world.

According to a recent study, deaths from Alzheimer's disease and other dementias rose more than **three-fold**, and deaths from Parkinson's disease **doubled** globally between 1990 and 2010.

Fortunately, scientific evidence indicates that we have substantial control over our risk for neurodegenerative diseases.

Dr. Preston Estep is an esteemed geneticist and the director of gerontology at the Personal Genome Project at Harvard Medical School.

In this interview with **Life Extension**[®], Dr. Estep highlights the secrets of the "Mindspan Elite"—those populations that live longest with low levels of dementia.

Studying these populations—along with recent scientific evidence—has given Dr. Estep insights on how to extend both lifespan and *mindspan*.

He shares many of those ideas here for **Life Extension**[®] readers.

—LAURIE MATHENA

LE: Can you explain the difference between lifespan and *mindspan*?

Dr. Estep: Lifespan measures how long we live, but how fulfilling that life is depends on how well your mind works during that time. I use the term “mindspan” to capture this essential idea.

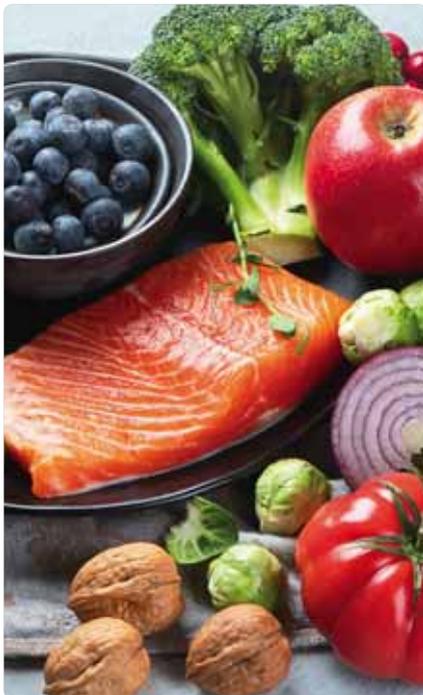
Lifespan refers only to longevity, while mindspan refers to the mind’s length of life plus its breadth and height of performance.

This pinnacle of living isn’t just a long lifespan, it is a *maximum mindspan*.

LE: Can you tell us about people you refer to as the *Mindspan Elite*?

Dr. Estep: People are living longer than ever. While this trend is good, there is a serious downside: Record numbers of people are experiencing greater levels of cognitive decline and other brain disorders in later life.

But some people seem mostly immune to such problems. I call these people the Mindspan Elite.



They live very long lives and remain as alert, active, and autonomous as people decades younger. Important discoveries from many sources have shed substantial light on the keys to their success, and now show the rest of us the way.

LE: After studying the Mindspan Elite, does it seem like their longevity is a result of genes or environment?

Dr. Estep: It is commonly believed that centenarians and supercentenarians have special genes that allow them to age slowly. Most experts agree that the contribution of genes explains only a small fraction of typical longevity, and a higher percentage of extreme longevity—maybe between **25%** and **40%** of extreme longevity.

That means environment is responsible for the remaining majority of the longevity equation, and diet is a major component of the environment.

When Japanese (who are part of the Mindspan Elite) move to other countries, their health typically goes downhill.

Japanese in the U.S. with the highest rates of disease, including Alzheimer’s disease and other dementias, have a more Western eating pattern. Their rates of dementia are similar to those of Americans of European ancestry.

So bad diet produces bad results—but luckily, this works both ways.

Many studies have shown that people who adopt healthy Asian and Mediterranean-style diets have lower levels of disease.

LE: What are some core diet commonalities of the Mindspan Elite?

Dr. Estep: Here is a short list:

- Less red meat and added sugar.
- Less liquid milk (moderate amounts of cheese, butter, sour cream).
- Moderate to fairly high amounts of fish and seafood, typically not deep-fried.
- More beans and other legumes.
- Fat consumption varies, but if it is high, then it is mostly monounsaturated (typically olive oil).
- Alcohol consumption varies but is routine, usually with meals, and is not extreme among the longest-lived.
- Abundant dietary phytochemicals, such as polyphenols and tannins, consumed with meals and present in fruits and vegetables, red wine, coffee, and tea.
- More fermented, pickled, and preserved foods, such as vinegar and dried fish.
- More greens. Key Mediterranean cuisines feature an abundance of greens and herbs. In Japan, sea vegetables (seaweed, kelp, etc.) are found in many meals.

LE: Many people erroneously promote a high-protein, low-carb diet. What can the Mindspan Elite teach us about protein?

Dr. Estep: Relatively low animal protein intake is a shared dietary attribute among Mindspan Elite regions and subcultures.

Research shows that animals raised on low-protein diets live longer than animals eating diets with typical amounts of protein.

The China Study, a well-known study done in the 1980s, found that dietary protein intake is a primary determinant of diseases in later life, including cardiovascular disease and cancers.

LE: What are key biomarkers we can use to determine our longevity and mindspan?

Dr. Estep: Some biomarkers are simply symptoms of a certain state or underlying process. But other biomarkers, such as telomere length, are more than just markers; they play critical roles in setting the pace of aging and senescence.

Telomeres are specialized stretches of DNA that protect the ends of chromosomes. Long, stable telomeres are robust predictors of good health and longevity. As we age, telomeres get broken down and become shorter.

In general, the shorter your telomeres are, the shorter your lifespan.

Most long-lived people in their eighties and nineties have telomeres as long as or longer than most people in their seventies.

LE: How can you influence the length of your telomeres?

Dr. Estep: The shortening of telomeres can be accelerated by certain environmental variables—including diet.

But here is the positive flip side: good diet and lifestyle factors can counteract this erosion.

Higher intake of omega-3 fats, good sleep, low stress, and routine exercise are all associated with longer telomere length.

LE: What other key biomarkers should people be testing?

Dr. Estep: Two of the most important and commonly measured cardiovascular biomarkers are cholesterol and triglyceride levels. If these are moderately elevated on their own, it's not necessarily reason for alarm.

Longevity and mindspan are at much greater risk if these high biomarker levels are accompanied by high blood iron levels, which accelerate the oxidation of LDL cholesterol.

High oxidation plus high LDL is deadly for both your heart and your brain.

LE: Isn't iron beneficial for the body?

Dr. Estep: Of all the dangerous double-edged swords, iron cuts the deepest of all.

The peril posed by iron is unique among all dietary minerals. It's the most abundant and potent oxidant in the body, but your body doesn't have a way to get rid of excess iron, unlike other minerals.

You can compare iron to a match in the presence of fuel and oxygen. In control, warmth and light are produced; out of control, the result is like a persistent, wind-driven wildfire.

Consider a car analogy: Dietary fats and sugars, like gasoline, are hydrocarbons that produce energy. Your body mixes this fuel with oxygen and then ignites it to create useful energy and heat.

We need iron to carry oxygen throughout the body for this essential process. But just as an older car rusts, so does your body.

Its rust comes in the form of deposits of "garbage"—for example, hemosiderin, lipofuscin, and amyloid

plaques in the brain that are primary drivers of Alzheimer's disease.

Rust also comes in the form of "damage," such as oxidized components of cells and tissues (e.g., DNA and proteins), and iron is a primary driver in the creation of this garbage and damage.

The higher the iron burden in your body, the greater the burden of accumulated garbage and damage over time, especially to brain neurons.

LE: How does excess iron impact the brain specifically?

Dr. Estep: In youth, iron is a critical nutrient for proper brain development.

However, high body iron stores in adulthood increase the risk of Alzheimer's disease, Parkinson's disease, ALS (Lou Gehrig's disease), stroke, and other diseases of the brain and nervous system.

In other words, we need lots of iron in youth, but as we get older, these amounts become harmful.

The brain typically has a higher concentration of iron than any other metal. Specific brain regions affected by very different neurodegenerative diseases have one commonality: They show high levels of iron deposits.

LE: Why do so many people have excess iron?

Dr. Estep: Because red meat consumption remains too high, and because of iron fortification. In the U.S. today, about half of dietary iron is obtained through fortified grain products.

Iron fortification is done with the best of intentions, but it is clear that low but sufficient iron poses no clear health risk to adults.

The problem with most iron-enriched grain products is that the iron is absorbed rapidly with large amounts of monosaccharide sugars from the breakdown of the starch in the grain.

This is a toxic and completely unnatural combination that produces unprecedented stresses on your body, especially your vasculature and your pancreas, which regulates insulin and glucose.

Some of the worst offenders are breakfast cereals that are hyper-enriched with iron.

And it is essential to understand that the amount of iron on nutritional labels is specific to menstruating women and is very misleading for everyone else. Older people and males need less than half of the recommended daily intake on food labels.

LE: So, red meats and iron-enriched grains are main sources of iron. Are there other largely invisible sources?

Dr. Estep: Veggie burgers used to consist of various beans and vegetables, but the new generation of plant-based meats, like Beyond and Impossible burgers taste more like meat because it was discovered recently that iron is a key ingredient that gives real meat its distinctive “meaty” flavor. There has been a lot of media coverage of these plant-based meats and many questions about whether or not they are good additions to a healthy diet. For premenopausal women and others with low iron, I think they are good substitutes for meat, but for everyone else, stick to low-iron, plant-based foods.

LE: As a geneticist, you have unique insights into how genes impact disease risk. Do genes also factor into your risk of Alzheimer’s disease?

Dr. Estep: Research scientists have turned up many clues about the genetic regulations of overall human and brain longevity, but two genes truly stand out, because they have by far the largest overall effects.

Those genes are called APOE and APP. Variants of both cause Alzheimer’s disease at an early age.

The APOE gene has repeatedly been proven to have the most significant longevity effect of any gene. It comes in three variant forms: e2, e3, and e4.

Everyone carries two copies of the APOE gene, but the two most problematic duos are the e3/e4 combination, which typically increases risk for Alzheimer’s disease by **two to three times**, and the e4/e4 combination, which increases risk by more than **10 times**.

LE: Why are these genes so problematic for the brain?

Dr. Estep: Both genes are influenced by diet and lifestyle, since they interact with iron, and amplify the effects of iron in the brain.

Recent evidence has been building that implicates APOE in the transport of iron to the brain. In mid-2015 the APOE and iron connection was elevated to the level of a near certainty.

An international consortium of several Alzheimer’s disease studies published the results of an over seven-year study of three groups of people: non-demented, mild cognitive impairment, and Alzheimer’s disease.

They found that the cerebrospinal fluid level of ferritin (the main iron storage protein in the body) predicted the degree of cognitive decline—higher ferritin led to faster decline and dementia.

They further found that the APOE e4 variant was associated with higher cerebrospinal fluid ferritin, more evidence that the e4 variant is responsible for raising iron load in the brain and driving cellular damage, tissue loss, and plaque formation.

LE: What about APP?

Dr. Estep: The gene for APP (amyloid precursor protein) causes the plaque (known as amyloid beta) seen in brains afflicted with Alzheimer’s disease. Research suggests that the job of APP in the brain is to protect cells and tissue from iron’s oxidative damage.

The APP gene protects the brain, but in the long run also harms the brain through the long-term consequences of this mode of protection. There is a basic formula:

GENES + ENVIRONMENT = TRAIT.

Dietary iron is the key environmental co-conspirator. So, in this case:

COMMON APP VARIANT + HIGH IRON = ALZHEIMER’S DISEASE.

Adding APOE e4 to the equation increases risk. Reducing dietary iron improves the ENVIRONMENT part of the equation and also reduces Alzheimer’s risk.

This is extremely important because more than **99%** of us carry the common variant of APP, and our best option right now for reducing risk of Alzheimer’s disease is to exert control through environmental regulators of risk.

LE: Are there other genes we should be concerned about?

Dr. Estep: Other problematic variants are found in genes governing absorption of iron from food, and some of these are very common.

About a quarter of the U.S. population has at least one copy of the APOE e4 variant, but another quarter has one or more variants in the HFE gene that increase absorption of iron from food, increasing the risk of iron overload, or hemochromatosis. The HFE gene is involved in regulating how much iron is absorbed from food, and the body has no natural mechanism for regulating iron balance by getting rid of iron once it is absorbed. So, it is critical to measure iron levels to ensure that overload is avoided preventively, because it is difficult to reverse iron overload, although blood donation (phlebotomy) and the use of iron chelators are helpful.

LE: While too much iron can clearly be problematic, low iron levels can cause their own concerns, such as anemia and increased susceptibility to infections. What is the ideal range of iron levels in the body?

Dr. Estep: Again, ferritin is the main iron storage protein in the body, and serum ferritin is a key biomarker that provides the best non-invasive measure of the amount of iron stored in the body.

For men and women, aim for **10 to 40 ng/mL** (standard units), or micrograms per liter (international units) for maximum health benefits. This range is based on historical levels in Japanese women. They have the lowest iron levels in the developed world, the longest lives, and low rates of Alzheimer's disease.

LE: What's your key takeaway for readers to help understand extending their *mindspan*?

Dr. Estep: When *The Mindspan Diet* was published a few years ago lots of evidence pointed to iron as

a key regulator of mindspan, but it was mostly circumstantial and provided statistical association but not clear evidence of causation. More recently, the largest and most advanced studies of human longevity* have strongly supported my conclusions about the importance of iron, showing that excess iron reduces longevity and that it isn't merely associated with, but is a primary cause, of accelerated aging.

Recent research also indicates that Alzheimer's disease is a close second to cancer as a cause of death in developed nations, and excess iron increases the risk of both these and other leading causes of death.

So, the bottom line is that iron is a critical nutrient for proper functioning of the body and mind, but I can't emphasize enough that most adults in developed countries get far too much of it. And the only way for someone to know if they are at risk is to test serum ferritin and other critical markers of iron. When your life depends on it, don't guess, test.

LE: Please tell us about your current projects.

Dr. Estep: In early 2020 I was planning the launch of a venture fund focused on starting and investing in biotech companies involved in increasing longevity and enhancing mindspan, but like many other people my plans changed as the pandemic unfolded. My main focus for the past year-and-a-half has been the Rapid Deployment Vaccine Collaborative (Radvac). As the pandemic gradually winds down I'm returning to focus on longevity/mindspan biotech startups and venture funding. •

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

* <https://www.sciencedirect.com/science/article/pii/S0261561420303368>, <https://www.nature.com/articles/s41467-020-17312-3>

Dr. Preston Estep received his doctorate from Harvard University. He is Director of Gerontology and advisor to the Personal Genome Project at Harvard Medical School. He has founded or is a scientific adviser to many leading biotech startup companies. He is the author of the book *The Mindspan Diet* and has addressed professional and lay audiences around the world on a range of topics in biomedicine including mindspan, genetic testing and whole genome DNA sequencing, vaccines, and space biomedicine.

The Mindspan Diet was published by Ballantine Books, an imprint of Random House, a division of Penguin Random House LLC. Excerpts reprinted by permission.

To order a copy of *The Mindspan Diet* visit [Amazon.com](https://www.amazon.com)



DISCOUNT PRICES

FOR PREMIUM-QUALITY PRODUCTS

Life Extension customers take extraordinary steps to stave off aging.

When customers buy from **Life Extension**, they are assured of receiving the **highest-quality** formulas based on the latest published scientific studies.

These pages reveal the **lower prices** that our customers enjoy during the annual **SUPER SALE**.

Each purchase at these **discount prices** qualifies for valuable **Rewards Dollars** that reduce the cost of future orders.



	SUPER SALE One Unit Price	SUPER SALE Four-Unit Per-Bottle Price
Extend-Release Magnesium • 60 vegetarian capsules, Item #02107 Provides immediate-release along with a 6-hour extended-release magnesium for sustained benefits.	\$8.78	\$7.88
Two-Per-Day Multivitamin • 120 capsules, Item #02314 (Two-month supply) Compared to commercial multivitamins, Two-Per-Day has up to 50 times the potency of specific nutrients, as well as unique ingredients.	\$16.20	\$14.40
Bio-Fisetin • 30 vegetarian capsules, Item #02414 After years of relentless research, an absorbable form of the plant flavonoid fisetin is finally available to target senescent cells .	\$10.13	\$9
BioActive Complete B-Complex • 60 vegetarian capsules, Item #01945 Enzymatically active forms of B vitamins .	\$8.10	\$7.20
Super Omega-3 Fish Oil, Sesame Lignans & Olive Extract 120 softgels, Item #01982 Highly purified EPA (1,400 mg) and DHA (1,000 mg) , sesame lignans plus potent olive extract , provides essential components of the Mediterranean diet in four softgels.	\$21.60	\$18.90
Zinc Caps • 90 vegetarian capsules, Item #01813 Zinc monomethionine and citrate provide 50 mg of absorbable zinc .	\$6.08	\$5.40
MacuGuard® Ocular Support with Saffron • 60 softgels, Item #01992 Lutein, <i>trans</i> -zeaxanthin, meso-zeaxanthin, and saffron help maintain structural integrity of the macula and retina. Just <u>one</u> softgel per day.	\$16.88	\$15.75
Advanced Curcumin Elite™ Turmeric Extract, Ginger & Turmerones 30 softgels, Item #02324 45 times greater free curcuminoid bioavailability, plus ginger and turmerones .	\$18	\$16.20
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ 100 mg, 60 softgels, Item #01426 Superior absorbing ubiquinol plus shilajit, which <u>complements</u> CoQ10 effectiveness.	\$41.85	\$35.10 \$32.40 (10-unit per-bottle price)

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.

TO ORDER CALL TOLL-FREE 1-800-544-4440

SUPER SALE
One Unit Price

SUPER SALE
Four-Unit
Per-Bottle Price

Optimized Resveratrol • 60 vegetarian capsules, Item #02230 This formula contains compounds that “turn on” longevity genes. It provides 250 mg of trans-resveratrol, quercetin (150 mg), and complementary plant extracts.	\$30.38	\$27
Super Selenium Complex • 100 vegetarian capsules, Item #01778 Combines three complementary forms of selenium with vitamin E for additional antioxidant protection.	\$9.45	\$8.10
Ultra Prostate Formula • 60 softgels, Item #02029 Comprehensive support for an aging prostate gland utilizing extracts from pygeum, nettle, flower pollen, and saw palmetto, plus boron, beta-sitosterol, and lycopene.	\$25.65	\$23.63 \$21.60 (10-unit per-bottle price)
Neuro-Mag® Magnesium L-Threonate • 90 vegetarian capsules, Item #01603 MIT research shows this form of magnesium helps maintain structural integrity of synaptic connections in the brain.	\$27	\$24.30
Bio-Quercetin • 30 vegetarian capsules, Item #02302 Ultra-absorbable quercetin for immune and cardiovascular health.	\$8.10	\$7.20
DHEA • 25 mg, 100 capsules, Item #00335 Supports immune function, mood, and lean muscle mass.	\$10.80	\$9.90
Optimized Ashwagandha • 60 vegetarian capsules, Item #00888 Improves cognitive function, reduces stress, helps maintain brain cell structure.	\$6.75	\$6.08
Super R-Lipoic Acid • 240 mg, 60 vegetarian capsules, Item #01208 Superior efficacy compared to alpha-lipoic acid—supplies 240 mg of stabilized R-lipoic acid.	\$33.08	\$30.38
Skin Restoring Ceramides • 30 liquid vegetarian capsules, Item #02096 Restores smoother, youthful-looking skin from the inside and out.	\$16.88	\$15.53
PQQ • 10 mg, 30 vegetarian capsules, Item #01500 Promotes generation of new mitochondria in aging cells.	\$12.15	\$9.90
Arterial Protect • 30 vegetarian capsules, Item #02004 Helps stabilize endothelial plaque and promote healthy blood flow throughout the body.	\$29.70	\$26.10
B12 Elite • 60 vegetarian lozenges, Item #02419 Two bioactive coenzyme forms of B12 used directly by the brain.	\$7.43	\$6.75
NAD⁺ Cell Regenerator™ and Resveratrol • 30 vegetarian capsules, Item #02348 NIAGEN® nicotinamide riboside, <i>trans-resveratrol,</i> quercetin, and more to support healthy cellular metabolism. NIAGEN® is a registered trademark of ChromaDex, Inc., Patents see: www.ChromaDexPatents.com .		<i>For Super Sale pricing available to readers of this magazine call 1-800-544-4440 or visit LifeExtension.com/NAD</i>

SuperSale

TO ORDER CALL
TOLL-FREE 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.

**HIGHLY
PURIFIED**

FISH OIL



Super Omega-3 provides components found in **Mediterranean diets**, including **sesame lignans** to extend the stability of **DHA** in the blood.



SUPER OMEGA-3 PLUS
EPA/DHA Fish Oil, Sesame Lignans,
Olive Extract, Krill & Astaxanthin
(2,520 mg of EPA + DHA in four softgels)

SUPER SALE PRICE
Item #01988 • 120 softgels
1 bottle **\$30.38** • 4 bottles \$28.35 each



SUPER OMEGA-3*
EPA/DHA Fish Oil,
Sesame Lignans & Olive Extract
(2,400 mg of EPA + DHA in four softgels)

SUPER SALE PRICE
Item #01982 • 120 softgels
1 bottle **\$21.60** • 4 bottles \$18.90 each

For full product description and to order **Super Omega-3**, or **Super Omega-3 Plus**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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

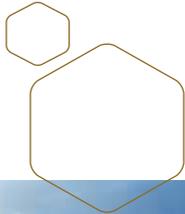
* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years. IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

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.

John Robbins

The Remarkable Legacy of the Baskin-Robbins Heir

BY LAURIE MATHENA



Not many people would turn down a billion-dollar family business to help promote the health and wellness of people and the planet.

But that's exactly what John Robbins, presumed heir to the Baskin-Robbins ice cream empire, did when he was only 21 years old.

Instead of profiting from a business that promotes obesity and disease by selling a food high in sugar and saturated fat, Robbins has dedicated his life to helping provide healthy, ethical, sustainable food for people around the world.

He has written 10 books about healthy living that have sold millions of copies, founded EarthSave International, and co-founded Food Revolution Network.

He has made countless TV and radio appearances—including the shows *Oprah* and *Donahue*—and has received numerous awards for his humanitarian efforts.

At 74 years old, Robbins is the epitome of good health, showing that eating a plant-based diet, living with purpose, and taking targeted supplements are key elements to an optimal-longevity lifestyle.

Walking Away from the Family Business

Burt Baskin, John Robbins' uncle and co-owner of Baskin-Robbins, died of a heart attack at the age of 54.

When Robbins questioned whether or not there was a connection between the amount of ice cream Burt had consumed and this fatal incident, the reply from Robbins' father Irv, the other co-owner of the business, was a stern "no."

"Different families have different taboo topics that don't get discussed. In my family, it was that there could be any connection between food and health," said Robbins. "My father didn't want to think that the product he was selling was hurting anybody, much less that it could have contributed to the death of his beloved partner. But I was starting to believe that the more ice cream you ate, the more likely you were to have heart disease, diabetes, and obesity."

He was also appalled by the cruelty he saw, first-hand, to the factory-farmed cows used to make the ice cream—animals that were unable to move, covered in flies, and standing in excrement up to their knees.

"I didn't want to make my living from selling a product that was undermining people's health," said Robbins. "I also didn't want to make a living selling a product that was based in such cruelty to animals."

That's why Robbins not only walked away from the family business—but also from any trust fund, or any other reliance on a fortune made from contributing to the poor health of millions.

Instead, over the next 50 years, Robbins built a different kind of empire: one that promoted life and health.

A Legacy Better than Ice Cream

Robbins' father Irv had developed a number of serious health problems, including type II diabetes and hypertension.

"His doctor told him all they could do was juggle his medications, control some of the side effects, and make his few remaining years more comfortable," said Robbins. "But then he also gave him a copy of my book (without knowing the author was his son) and told him that if he was willing to consider making major changes in how he lived, there could be a different outcome."

The book, called *Diet for a New America: How Your Food Choices Affect Your Health, Happiness, and the Future of Life on Earth*, was

nominated for the Pulitzer Prize for General Nonfiction in 1987 and has been described as the single most eloquent argument for a vegetarian lifestyle ever published.

Irv had never believed in the connection between food and health. But after hearing this recommendation from his renowned cardiologist, he decided to read the book and put his son's health advice into practice.

After just two years, his diabetes had *reversed*, and his blood pressure had *normalized*.

By simply making gradual changes to his diet, he no longer needed insulin, diabetic pills, or hypertension drugs.

"He lived another 20 healthy years after that. In the long run I felt I had been able to give him something more important than inventing a 32nd flavor," said Robbins, referring to the famous 31 flavors of Baskin-Robbins.

Now, Robbins is working hard to create success stories like these for people all over the world.





John Robbins' Daily Supplement List

- Melatonin
- R-Lipoic Acid
- Vitamin K
- Taurine
- Zinc
- N-Acetyl-L-Cysteine
- Algae-based DHA and EPA
- L-Theanine
- Vitamin D
- Ubiquinol
- Vitamin B12

Changing the World One Bite at a Time

In 2012, Robbins teamed up with his son, Ocean, to found Food Revolution Network, an organization dedicated to “healthy, ethical, sustainable food for all.”

It has grown to include half a million members, and their goal is to empower individuals and transform food systems to support healthy people and a healthy planet.

Robbins is passionate about educating people about the health consequences of eating processed foods, the cruelty to animals in industrialized feed lots, and the detrimental effects to the earth caused by factory farming.

“The data are clear that the highly processed foods that most of us are eating and drinking cause an enormous amount of physical disease,” said Robbins. “On the other hand, we have very convincing data that people who eat whole food, plant-based diets—and who don’t eat the factory-farmed meat and the industrially processed food—live

longer and healthier. Their lifespan is increased, but even more importantly, their healthspan is increased.”

Industrialized farming is also causing enormous consequences to the planet, including the erosion of topsoil, depletion of groundwater, and the emission of greenhouse gases.

But simply eating a healthier *diet* can promote a healthier *planet*.

“One study showed that greenhouse gas emissions could be lowered more by eating a plant-based diet than by driving an electric car,” said Robbins.

One practical way Food Revolution Network is working to provide healthy food for all is by fighting to end the subsidies that spend tens of billions of taxpayer dollars in ways that bring down the price of white bread, high fructose corn syrup, and factory-farmed animal products.

“These are the very foods that every credible health authority is telling us we should be eating *less* of. If the government is going to subsidize anything, it should

subsidize fruits, vegetables, nuts and seeds, and legumes—the foods that tens of thousands of medical studies are telling us we should be eating *more* of,” said Robbins.

They are also working to have taxes placed on soda and other grossly unhealthy foods and beverages, and then using the revenue to bring down the cost of healthy foods like fruits and vegetables.

“Steps like this would help make healthy food more affordable, more accessible, and more available to everyone, which is our ultimate goal,” said Robbins.

Let Food be Thy Medicine

Robbins is also taking steps to have nutritional education taught in medical schools.

“I once had a Harvard doctor tell me that if food was medicine, he would have learned about it in medical school,” said Robbins. “This highlights the total lack of nutritional education in medical schools, which is quite disturbing.”

To address this issue, Robbins and his team at Food Revolution Network have joined with The American College of Lifestyle Medicine in a campaign to get nutritional education questions added to the licensure exams given to medical school graduates.

They've gotten more than 1,000 approved questions added to the bank that medical schools can draw from, and these lifestyle medicine questions are already beginning to be used.

The goal is that in the coming years, questions on food and nutrition will come to make up **10%** (or more) of the questions that are used.

This would ultimately cause all medical schools to begin teaching food nutrition to their students.

Living a Vibrant Life

Robbins' own personal health journey is just as remarkable as his professional accomplishments.

After walking away from the Baskin-Robbins business, Robbins moved to a small island off the coast of British Columbia, Canada, built a one-room log cabin, and grew most of his own food.

He lived off less than \$500 per year.

But long before that, as a child, he had polio and was confined to a wheelchair for a period of time—something that has caused him to never take movement for granted.

For years he ran marathons and competed in triathlons. Now, at age 74, he still loves to hike, work out in his home gym, and do yoga.

He eats the same whole-food, plant-based diet that he promotes with the Food Revolution Network.

"I wake up in a body that's vital and vibrant, and that wants to live, where the energy is expansive," said Robbins.

He also takes targeted supplements for increased healthspan and lifespan.

"Even those of us who work really hard at eating a clean diet are still breathing polluted air and are still surrounded by toxic materials. It's also very hard today to get all your nutrients from food," said Robbins. "Because of this, I see a real role for supplements."

As part of his daily routine, Robbins takes nearly a dozen supplements, including vitamins D, B12, and K, melatonin, R-lipoic acid, N-acetyl L-cysteine, L-theanine, ubiquinol, and more.

When people wonder how making simple food choices—like eating plant-based food instead of factory-farmed meat, or choosing to eat organic—could have such a major impact on their lives and the world, Robbins simply tells them this:

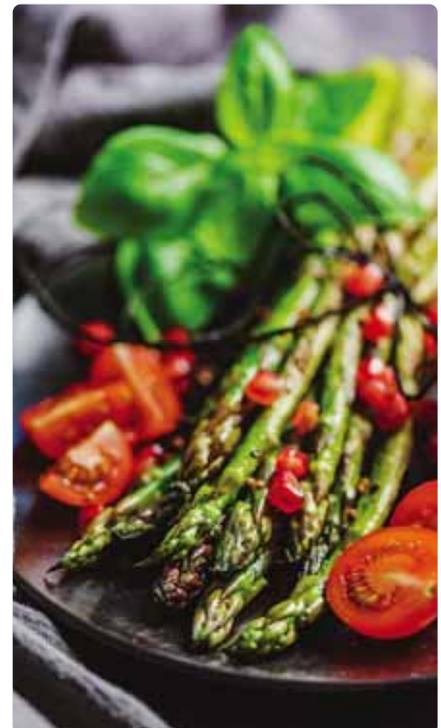
"Everybody needs to eat in order to live, and every bite you take is essentially a vote. You're voting for the health you want and for the world you want. The votes you cast with your food choices literally change the course of your destiny and have a powerful impact on the future of life on earth.

"In addition to improving your lifespan and healthspan, you're contributing to a world with fewer animals being tortured in factory farms, less erosion of our topsoil, and less depletion of our groundwater. You'll be helping to create a world that will be healthier and more beautiful for future generations." •

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

To learn more about Food Revolution Network, visit www.foodrevolution.org

John Robbins has written 10 books on healthy living that have sold millions of copies and been translated into 30 languages. He founded EarthSave International and co-founded Food Revolution Network with his son, Ocean. He has been a keynote speaker at conferences sponsored by Physicians for Social Responsibility, the United Nations Environmental Program, UNICEF, and more. He has appeared on national shows including *Oprah*, *Donahue*, and *Geraldo*. And he is the recipient of the Rachel Carson Award, the Albert Schweitzer Humanitarian Award, the Peace Abbey's Courage of Conscience Award, and lifetime achievement awards from groups including Green America.



Fennel

BY LAURIE MATHENA



Reference

1. Badgujar SB, Patel VV, Bandivdekar AH. *Foeniculum vulgare* Mill: a review of its botany, phytochemistry, pharmacology, contemporary application, and toxicology. *Biomed Res Int.* 2014;2014:842674.

Fennel is an herb that originated from the Mediterranean region. It is commonly used in Greek cooking for its licorice-like flavor, and its favorable effects on digestive, endocrine, reproductive, and respiratory issues.¹

Benefits can be derived from both the fennel bulb and the seeds.

Fennel is a rich source of health-promoting plant compounds, including the polyphenols rosmarinic acid, quercetin, and apigenin.

In-vitro and in-vivo studies show that these compounds have antimicrobial, antiviral, anti-inflammatory, anti-mutagenic, anti-spasmodic, anti-thrombotic, hypoglycemic, memory-enhancing, and stress-relieving properties.¹

People in many cultures chew fennel seeds after meals to help with digestion and eliminate bad breath. And in Ayurvedic medicine, fennel seeds are used as a laxative, because they help move food through the intestines and promote excretion.

Fennel may be eaten raw in salads and snacks, and it can be stewed, boiled, grilled, or baked. It can also be used in the preparation of herbal teas or as an essential oil.

ACTIVE LIFESTYLE & FITNESS

- 01529 Creatine Capsules
- 02020 Super Carnosine
- 02023 Tart Cherry with CherryPURE®
- 02146 Wellness Bar—Chocolate Brownie
- 02147 Wellness Bar—Cookie Dough
- 02246 Wellness Code® Advanced Whey Protein Isolate Vanilla
- 02221 Wellness Code® Muscle Strength & Restore Formula
- 02127 Wellness Code® Plant Protein Complete & Amino Acid Complex
- 02261 Wellness Code® Whey Protein Concentrate Chocolate
- 02260 Wellness Code® Whey Protein Concentrate Vanilla
- 02243 Wellness Code® Whey Protein Isolate Chocolate
- 02242 Wellness Code® Whey Protein Isolate Vanilla

AMINO ACIDS

- 01039 Arginine & Ornithine Capsules
- 00038 Arginine Ornithine Powder
- 01253 Branched Chain Amino Acids
- 01829 Carnosine
- 01671 D,L-Phenylalanine Capsules
- 01624 L-Arginine Caps
- 01532 L-Carnitine
- 00345 L-Glutamine
- 00141 L-Glutamine Powder
- 01678 L-Lysine
- 01827 Taurine
- 00133 Taurine Powder
- 00326 Tyrosine Tablets

BLOOD PRESSURE & VASCULAR SUPPORT

- 01824 Advanced Olive Leaf Vascular Support
- 02004 Arterial Protect
- 70000 Blood Pressure Monitor Arm Cuff
- 02497 Endothelial Defense™ Pomegranate Plus
- 02320 NitroVasc™ Boost
- 00984 Optimal BP Management
- 01953 Pomegranate Complete
- 00956 Pomegranate Fruit Extract
- 02024 Triple Action Blood Pressure AM/PM
- 02102 Venoflow™

BONE HEALTH

- 01726 Bone Restore
- 02123 Bone Restore Chewable Tablet
- 02416 Bone Restore Elite with Super Potent K2
- 01727 Bone Restore with Vitamin K2
- 01725 Bone Strength Collagen Formula
- 00313 Bone-Up™
- 01963 Calcium Citrate with Vitamin D
- 01506 Dr. Strum's Intensive Bone Formula
- 02417 Mega Vitamin K2
- 01476 Strontium Caps

BRAIN HEALTH

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 01659 CDP Choline
- 02321 Cognitex® Basics
- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone
- 01540 DMAE Bitartrate
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 02212 Focus Tea™
- 01658 Ginkgo Biloba Certified Extract™
- 01527 Huperzine A
- 00020 Lecithin
- 02101 Memory Protect

- 00709 Migra-Eeze™
- 01603 Neuro-Mag® Magnesium L-Threonate Caps
- 02032 Neuro-Mag® Magnesium L-Threonate Powder
- 00888 Optimized Ashwagandha
- 01676 PS (Phosphatidylserine) Caps
- 02406 Quick Brain Nootropic
- 01327 Vinpocetine

CHOLESTEROL MANAGEMENT

- 01828 Advanced Lipid Control
- 01359 Cho-Less™
- 01910 CHOL-Support™
- 01030 Red Yeast Rice
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

DIGESTION SUPPORT

- 53348 Betaine HCl
- 02412 Bloat Relief
- 30747 Digest RC®
- 07136 Effervescent Vitamin C - Magnesium Crystals
- 02021 Enhanced Super Digestive Enzymes
- 02022 Enhanced Super Digestive Enzymes and Probiotics
- 02033 EsophaCool™
- 01737 Esophageal Guardian
- 01706 Extraordinary Enzymes
- 02100 Gastro-Ease™
- 01122 Ginger Force™
- 00605 Regimint
- 01386 TruFiber®

ENERGY MANAGEMENT

- 01628 Adrenal Energy Formula • 60 veg capsules
- 01630 Adrenal Energy Formula • 120 veg capsules
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 01805 Ginseng Energy Boost
- 00668 Metabolic Advantage Thyroid Formula™
- 01869 Mitochondrial Basics with PQQ
- 01868 Mitochondrial Energy Optimizer with PQQ
- 01904 NAD+ Cell Regenerator™ • 100 mg, 30 veg capsules
- 02344 NAD+ Cell Regenerator™ 300 mg, 30 veg capsules
- 02348 NAD+ Cell Regenerator™ and Resveratrol
- 01500 PQQ Caps • 10 mg, 30 vegetarian capsules
- 01647 PQQ Caps • 20 mg, 30 vegetarian capsules
- 00889 Rhodiola Extract
- 02003 Triple Action Thyroid

EYE HEALTH

- 01923 Astaxanthin with Phospholipids
- 00893 Brite Eyes III
- 02323 Digital Eye Support
- 01514 Eye Pressure Support with Mirtogenol®
- 01992 MacuGuard® Ocular Support with Saffron
- 01993 MacuGuard® Ocular Support with Saffron & Astaxanthin
- 01873 Standardized European Bilberry Extract
- 01918 Tear Support with MaquiBright®

FISH OIL & OMEGAS

- 02311 Clearly EPA/DHA Fish Oil
- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
- 01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
- 01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels

- 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
- 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
- 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
- 01812 Provinal® Purified Omega-7
- 01640 Vegetarian DHA

FOOD

- 02008 California Estate Extra Virgin Olive Oil
- 02170 Rainforest Blend Decaf Ground Coffee
- 02169 Rainforest Blend Ground Coffee
- 02171 Rainforest Blend Whole Bean Coffee
- 00438 Stevia™ Organic Liquid Sweetener
- 00432 Stevia™ Sweetener

GLUCOSE MANAGEMENT

- 01503 CinSulin® with InSea2® and Crominex® 3+
- 01620 CoffeeGenic® Green Coffee Extract
- 02122 Glycemic Guard™
- 00925 Mega Benfotiamine
- 01803 Tri Sugar Shield®

HEART HEALTH

- 01066 Aspirin (Enteric Coated)
- 01842 BioActive Folate & Vitamin B12 Caps
- 01700 Cardio Peak™
- 02121 Homocysteine Resist
- 02018 Optimized Carnitine
- 01949 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 50 mg, 60 softgels
- 01951 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 100 mg, 60 softgels
- 01929 Super Ubiquinol CoQ10
- 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
- 01425 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels
- 01437 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels
- 01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels
- 01431 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels
- 01733 Super Ubiquinol CoQ10 with PQQ
- 01859 TMG Liquid Capsules
- 00349 TMG Powder

HORMONE BALANCE

- 00454 DHEA • 15 mg, 100 capsules
- 00335 DHEA • 25 mg, 100 capsules
- 00882 DHEA • 50 mg, 60 capsules
- 00607 DHEA • 25 mg, 100 vegetarian dissolve in mouth tablets
- 01689 DHEA • 100 mg, 60 veg capsules
- 02368 Optimized Broccoli and Cruciferous Blend
- 00302 Pregnenolone • 50 mg, 100 capsules
- 00700 Pregnenolone • 100 mg, 100 capsules
- 01468 Triple Action Cruciferous Vegetable Extract
- 01469 Triple Action Cruciferous Vegetable Extract and Resveratrol

IMMUNE SUPPORT

- 02411 5 Day Elderberry Immune
- 00681 AHCC®
- 02302 Bio-Quercetin®
- 02410 Black Elderberry + Vitamin C
- 01961 Enhanced Zinc Lozenges
- 01704 Immune Modulator with Tinofend®
- 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic

- 02005 Immune Senescence Protection Formula™
- 00316 Kyolic® Garlic Formula 102
- 00789 Kyolic® Reserve
- 01681 Lactoferrin (Apolactoferrin) Caps
- 02426 Mushroom Immune with Beta Glucans
- 01903 NK Cell Activator™
- 01394 Optimized Garlic
- 01309 Optimized Quercetin
- 01811 Peony Immune
- 00525 ProBoost Thymic Protein A
- 01708 Reishi Extract Mushroom Complex
- 01906 Standardized Cistanche
- 13685 Ten Mushroom Formula®
- 01097 Ultra Soy Extract
- 01561 Zinc Lozenges

INFLAMMATION MANAGEMENT

- 01639 5-LOX Inhibitor with AprèsFlex®
- 02324 Advanced Curcumin Elite™
Turmeric Extract, Ginger & Turmerones
- 01709 Black Cumin Seed Oil
- 02310 Black Cumin Seed Oil and Curcumin Elite™
- 00202 Boswella
- 02467 Curcumin Elite™ Turmeric Extract • 30 veg capsules
- 02407 Curcumin Elite™ Turmeric Extract • 60 veg capsules
- 01804 Cytokine Suppress® with EGCG
- 02223 Pro-Resolving Mediators
- 00318 Serrafazyme
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract
- 01254 Zyflamend™ Whole Body

JOINT SUPPORT

- 02404 Arthro-Immune Joint Support
- 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
- 01617 ArthroMax® with Theaflavins & AprèsFlex®
- 02138 ArthroMax® Elite
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 01050 Krill Oil
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

KIDNEY & BLADDER SUPPORT

- 00862 Cran-Max® Cranberry Whole Fruit Concentrate
- 01424 Optimized Cran-Max® with Ellirose™
- 01921 Uric Acid Control
- 01209 Water-Soluble Pumpkin Seed Extract

LIVER HEALTH & DETOXIFICATION

- 01922 Advanced Milk Thistle • 60 softgels
- 01925 Advanced Milk Thistle • 120 softgels
- 02240 Anti-Alcohol Complex
- 01651 Calcium D-Glucarate
- 01571 Chlorophyllin
- 01522 Milk Thistle • 60 veg capsules
- 02402 FLORASSIST® Liver Restore™
- 01541 Glutathione, Cysteine & C
- 01393 HepatoPro
- 01608 Liver Efficiency Formula
- 01534 N-Acetyl-L-Cysteine
- 00342 PectaSol-C® Modified Citrus Pectin Powder
- 01080 PectaSol-C® Modified Citrus Pectin Capsules
- 01884 Silymarin
- 02361 SOD Booster

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02405 Endocannabinoid System Booster
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02133 GEROPROTECT® Longevity A.I.™
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol
- 00070 RNA (Ribonucleic Acid)
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

MEN'S HEALTH

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Control
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01837 Pomi-T®
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 01677 Iron Protein Plus
- 02403 Lithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrate)
- 01328 Only Trace Minerals
- 01504 Optimized Chromium with Crominex® 3+
- 02309 Potassium with Extend-Release Magnesium
- 01740 Sea-Iodine™
- 01879 Se-Methyl L-Selenocysteine
- 01778 Super Selenium Complex
- 00213 Vanadyl Sulfate
- 01813 Zinc Caps

MISCELLANEOUS

- 00577 Potassium Iodide
- 00657 Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT

- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 01074 5 HTP
- 01683 L-Theanine
- 02175 SAMe (S-Adenosyl-Methionine)
200 mg, 30 enteric coated vegetarian tablets
- 02176 SAMe (S-Adenosyl-Methionine)
400 mg, 30 enteric coated vegetarian tablets
- 02174 SAMe (S-Adenosyl-Methionine)
400 mg, 60 enteric coated vegetarian tablets
- 02429 Theanine XR™ Stress Relief

MULTIVITAMINS

- 02199 Children's Formula Life Extension Mix™
- 02498 Comprehensive Nutrient Packs ADVANCED
- 02354 Life Extension Mix™ Capsules
- 02364 Life Extension Mix™ Capsules without Copper
- 02356 Life Extension Mix™ Powder
- 02355 Life Extension Mix™ Tablets
- 02357 Life Extension Mix™ Tablets with Extra Niacin
- 02365 Life Extension Mix™ Tablets without Copper
- 02292 Once-Daily Health Booster • 30 softgels
- 02291 Once-Daily Health Booster • 60 softgels
- 02313 One-Per-Day Tablets
- 02428 Plant-Based Multivitamin
- 02317 Two-Per-Day Capsules • 60 capsules
- 02314 Two-Per-Day Capsules • 120 capsules
- 02316 Two-Per-Day Tablets • 60 tablets
- 02315 Two-Per-Day Tablets • 120 tablets

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

- 01006 Biosil™ • 5 mg, 30 veg capsules
- 01007 Biosil™ • 1 fl oz
- 00321 Dr. Proctor's Advanced Hair Formula
- 00320 Dr. Proctor's Shampoo
- 02322 Hair, Skin & Nails Collagen Plus Formula
- 01278 Life Extension Toothpaste
- 00408 Venotone
- 00409 Xyliwhite Mouthwash
- 02304 Youthful Collagen
- 02252 Youthful Legs

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

- 01622 Bifdo GI Balance
- 01825 FLORASSIST® Balance
- 02421 FLORASSIST® Daily Bowel Regularity
- 02125 FLORASSIST® GI with Phage Technology
- 01821 FLORASSIST® Heart Health
- 02250 FLORASSIST® Mood Improve
- 02208 FLORASSIST® Immune & Nasal Defense
- 02120 FLORASSIST® Oral Hygiene
- 02203 FLORASSIST® Prebiotic
- 01920 FLORASSIST® Throat Health
- 02400 FLORASSIST® Winter Immune Support
- 52142 Jarro-Dophilus® for Women
- 00056 Jarro-Dophilus EPS® • 60 veg capsules
- 21201 Jarro-Dophilus EPS® • 120 veg capsules
- 01038 Theralac® Probiotics
- 01389 TruFlora® Probiotics

SKIN CARE

- 80157 Advanced Anti-Glycation Peptide Serum
- 80165 Advanced Growth Factor Serum
- 80170 Advanced Hyaluronic Acid Serum
- 80154 Advanced Lightening Cream
- 80155 Advanced Peptide Hand Therapy
- 80175 Advanced Probiotic-Fermented Eye Serum
- 80177 Advanced Retinol Serum
- 80152 Advanced Triple Peptide Serum
- 80140 Advanced Under Eye Serum with Stem Cells
- 80137 All-Purpose Soothing Relief Cream
- 80139 Amber Self MicroDermAbrasion
- 80118 Anti-Aging Mask
- 80151 Anti-Aging Rejuvenating Face Cream

- 80153 Anti-Aging Rejuvenating Scalp Serum
- 80179 Brightening Peptide Serum
- 80176 Collagen Boosting Peptide Cream
- 80156 Collagen Boosting Peptide Serum
- 02408 Collagen Peptides for Skin & Joints
- 80180 CoQ10 and Stem Cell Rejuvenation Cream
- 80169 Cucumber Hydra Peptide Eye Cream
- 02423 Daily Skin Defense
- 80141 DNA Support Cream
- 80163 Eye Lift Cream
- 80123 Face Rejuvenating Anti-Oxidant Cream
- 80109 Hyaluronic Facial Moisturizer
- 80110 Hyaluronic Oil-Free Facial Moisturizer
- 80138 Hydrating Anti-Oxidant Facial Mist
- 00661 Hydroderm
- 55495 Instensive Moisturizing Cream
- 80103 Lifting & Tightening Complex
- 80168 Melatonin Advanced Peptide Cream
- 80114 Mild Facial Cleanser
- 80172 Multi Stem Cell Hydration Cream
- 80159 Multi Stem Cell Skin Tightening Complex
- 80122 Neck Rejuvenating Anti-Oxidant Cream
- 80174 Purifying Facial Mask
- 80150 Renewing Eye Cream
- 80142 Resveratrol Anti-Oxidant Serum
- 01938 Shade Factor™
- 02129 Skin Care Collection Anti-Aging Serum
- 02130 Skin Care Collection Day Cream
- 02131 Skin Care Collection Night Cream
- 80166 Skin Firming Complex
- 02096 Skin Restoring Ceramides
- 80130 Skin Stem Cell Serum
- 80164 Skin Tone Equalizer
- 80143 Stem Cell Cream with Alpine Rose
- 80148 Tightening & Firming Neck Cream
- 80161 Triple-Action Vitamin C Cream
- 80162 Ultimate MicroDermabrasion
- 80173 Ultimate Peptide Serum
- 80178 Ultimate Telomere Cream
- 80160 Ultra Eyelash Booster
- 80101 Ultra Wrinkle Relaxer
- 80113 Under Eye Refining Serum
- 80104 Under Eye Rescue Cream
- 80171 Vitamin C Lip Rejuvenator
- 80129 Vitamin C Serum
- 80136 Vitamin D Lotion
- 80102 Vitamin K Cream

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01551 Enhanced Sleep with Melatonin
- 01511 Enhanced Sleep without Melatonin
- 02234 Fast-Acting Liquid Melatonin
- 01669 Glycine
- 02308 Herbal Sleep PM
- 01722 L-Tryptophan
- 01668 Melatonin • 300 mcg, 100 veg capsules
- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets

- 01786 Melatonin 6 Hour Timed Release 3 mg, 60 veg tablets
- 01721 Optimized Tryptophan Plus
- 01444 Quiet Sleep
- 01445 Quiet Sleep Melatonin
- 02502 Rest & Renew

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 00664 Beta-Carotene
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin Phytosome
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00065 MK-7
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 02335 Super K Elite
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin Phytosome • 60 veg tablets
- 02227 Vitamin C and Bio-Quercetin Phytosome • 250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
- 01509 Advanced Anti-Adipocyte Formula
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 02478 DHEA Complete
- 01738 Garcinia HCA
- 01908 Mediterranean Trim with Sinetrol™ -XPur
- 01432 Optimized Saffron
- 00818 Super CLA Blend with Sesame Lignans

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 01064 Femmenessence MacaPause®
- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01441 Progesta-Care®
- 01649 Super-Absorbable Soy Isoflavones

Turn Back

the Hands of Time



SUPER SALE PRICE

Item #02414

30 vegetarian capsules

1 bottle **\$10.13**

4 bottles \$9 each

Fisetin has a range of benefits that may increase lifespan. Most impressively, it's better than other plant compounds at clearing out senescent cells that are no longer functioning effectively. Our Bio-Fisetin formula is up to 25 times more bioavailable than other fisetin formulas—another way to reverse the clock!



For full product description and to order **Bio-Fisetin**,
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.

More Nutrients
Higher Potencies

LIFE EXTENSION® TWO-PER-DAY MULTIVITAMIN

Compared to Centrum®
Two-Per-Day Provides:

- 50 times the VITAMIN B1
- 25 times the VITAMIN B6
- 12 times the VITAMIN B12
- 10 times the BIOTIN
- 10 times the SELENIUM
- 8 times the VITAMIN C
- 2.5 times the VITAMIN B3
- 2 times the VITAMIN D
- 3 times the VITAMIN E
- 2 times the ZINC



Two-Per-Day Multivitamin Tablets

SUPER SALE PRICE

Item #02315 • 120 tablets (two-month supply)
1 bottle \$15.53 • 4 bottles \$13.95 each

Two-Per-Day Multivitamin Capsules

SUPER SALE PRICE

Item #02314 • 120 capsules (two-month supply)
1 bottle \$16.20 • 4 bottles \$14.40 each

Each bottle provides a two-month supply.

For full product description and to order **Two-Per-Day Multivitamin**,
call **1-800-544-4440** or visit **www.Life Extension.com**



Lycored LycoBeads® is a registered trademark of Lycored; Orange, New Jersey. SelenoExcell® is a registered trademark of Cypress Systems Inc. L-OptiZinc® and logo are trademarks of Lonza or its affiliates. Crominex® 3+, Capros® and PrimaVie® are registered trademarks of Natreon, Inc.

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



LIFE EXTENSION®

The Science of a Healthier Life®

PO BOX 407198
FORT LAUDERDALE, FLORIDA 33340-7198



IN THIS EDITION OF *LIFE EXTENSION MAGAZINE*®



24 RISKS OF SITTING TOO LONG

Americans spend more than half their waking time sitting, which can lead to **deep vein thrombosis**.

35 VINPOCETINE IMPROVES HEARING CAPACITY

A **2021** clinical study found that **vinpocetine**, a brain-boosting compound, also improved **hearing** capacity.

40 NUTRIENTS THAT PROTECT AGAINST MEMORY LOSS

Two nutrients have been **clinically shown** to *improve* memory function and stabilize cognitive dysfunction.

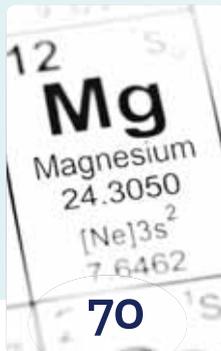


50 SAFE RELIEF FROM ACUTE PAIN

A **2020** human study shows a **plant extract** combination relieved **musculoskeletal pain** as quickly as **acetaminophen**.

60 PROBIOTIC THAT LOWERS CHOLESTEROL

In a clinical trial, a unique **probiotic** *reduced* LDL by **12%** and total cholesterol by **9%** in nine weeks.



70 MAGNESIUM MITIGATES MIGRAINES

Magnesium combined with **riboflavin** and **CoQ10** helps prevent migraines and lessens their duration and severity.

VISIT US ONLINE AT LIFEEXTENSION.COM