



The Science of a Healthier Life®

LifeExtension.com

May 2021

FEATURE ARTICLES

- 7 Heart Attack Makes Deadly Comeback
- 28 Bioactive B12 Inhibits Neurotoxicity
- 40 Reduce Nighttime Male Urinary Issues
- 52 Fish Oil Combats Metabolic Syndrome
- 62 Blood Tests Detect Cardiac Risks
- 72 Update: Vitamin D Human Studies

# New Form of **VITAMIN B12** Protects Aging **Brain Cells**







# COMPREHENSIVE Omega-3 SUPPORT

**Fish oil** is widely used to protect heart health.

**Olive oil** also has vascular benefits.

**Super Omega-3** provides **EPA/DHA** from ultra-pure **fish oil** + standardized **polyphenols** from extra-virgin **olive oil**.

**Sesame lignans** stabilize **omega-3s** to perform better in your body.



Item #01982 • 120 softgels

1 bottle \$24 • 4 bottles \$21 each

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.

For full product description and to order **Super Omega-3 EPA/DHA Fish Oil with Sesame Lignans & Olive Extract**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



## REPORTS

### 28 ON THE COVER

#### PROTECT BRAIN CELLS WITH NOVEL VITAMIN B12

Two active forms of **vitamin B12** offer support to the aging brain. Preclinical data shows one of the forms protects **dopamine** levels.



28



40



52



62



72

#### 40 CHALLENGE OF MIDDLE-OF-THE-NIGHT URINATION

**Nighttime urination** (nocturia) is a serious problem for most aging men. A clinical trial with targeted nutrients *reduced* nocturia in **64%** of the study subjects.

#### 52 FISH OIL FIGHTS METABOLIC SYNDROME

Nearly half of Americans **over 60** have metabolic syndrome. **Omega-3** fatty acids found in **fish oil** can *decrease* risk and *reverse* certain aspects of **metabolic syndrome**.

#### 62 BLOOD TESTS TO BETTER PREDICT CARDIOVASCULAR RISK

Doctors rely on basic lipid profiles to determine heart attack risk, but more precise **blood tests** can better pinpoint cardiovascular vulnerability.

#### 72 VITAMIN D UPDATE

Research continues to show the impact of **vitamin D** on all aspects of health.

## DEPARTMENTS

#### 7 AS WE SEE IT: HEART ATTACK MAKES DEADLY COMEBACK

Cardiovascular deaths are rising due to surging rates of obesity and diabetes. **Comprehensive blood tests** can identify risk factors before the onset of irreversible disease.

#### 19 IN THE NEWS

Folic acid lowers risk of erectile dysfunction; AMPK helps maintain muscle mass; CoQ10 reduces statin side effects; anti-inflammatories may improve depression; prediabetes linked to cognitive decline.

#### 79 WHAT IS GLUTAMINE?

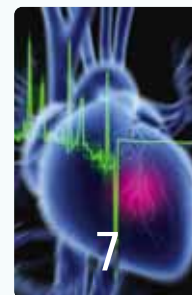
The versatile and *semi-essential* amino acid **glutamine** can improve intestinal health and exercise response.

#### 85 HEALTHY EATING

Brooks Headley shares recipes from his restaurant, Superiority Burger, in his new cookbook.

#### 91 SUPERFOODS

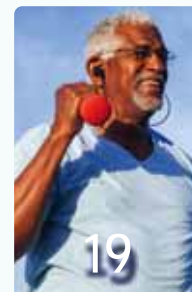
Cauliflower is low in calories and carbs and high in vitamins, minerals, and phytochemicals. Studies link it to lower risk of overall mortality, especially death from cardiovascular disease.



7



79



19



91





### Connect with Life Extension Online!



find us on  
**facebook**

Facebook.com/LifeExtension



follow us on  
**twitter**

Twitter.com/LifeExtension

Customer care is available to take your calls  
24 hours a day, 7 days a week: 1-800-678-8989

### 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



Nutrition Center of Florida, Inc., 5990 North Federal Highway,  
Fort Lauderdale, FL 33308-2633 • 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—3-Time Winner

Ratings based on results of  
the 2020 ConsumerLab.com survey  
of supplement users. More information at  
[www.ConsumerLab.com/survey](http://www.ConsumerLab.com/survey).

### Editorial

Editor-in-Chief • Philip Smith  
Executive Managing Editor • Renee Price  
Medical Editor • Hernando Latorre, MD, MS  
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 • Chancellor Faloon • Laurie Mathena  
Marsha McCulloch, RD

### Advertising

Vice President of Marketing • Rey Searles • [rsearles@lifeextension.com](mailto:rsearles@lifeextension.com)  
National Advertising Manager • JT Hroncich • 404-347-4170

### Senior Director of Sales and Business Development

Carolyn Bouchard • [cbouchard@lifeextension.com](mailto: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](mailto:customerservice@LifeExtension.com)

Wellness specialists: 800-226-2370 • Email: [wellness@LifeExtension.com](mailto: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](mailto:LEmagazine@LifeExtension.com)

**LIFE EXTENSION** (ISSN 1524-198X) Vol. 27, No. 5 ©2021 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. Printed in 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.



# Paint Your Heart

A Healthy Picture

**Pomegranate Complete** combines extracts from the **whole fruit, flower, and seed oil** to support system-wide health.

These pomegranate plant compounds help promote a healthy inflammatory response and combat age-related metabolic changes.



Item #01953 • 30 softgels  
1 bottle **\$18**  
4 bottles \$15.75 each

For full product description and to order **Pomegranate Complete**, call **1-800-544-4440** or visit **[www.LifeExtension.com](http://www.LifeExtension.com)**

POMELLA® extract is covered under U.S. Patent 7,638,640 and POMELLA® is a registered trademark of Verdure Science, 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.



**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 boardcertified 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](http://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 Montenaepoleone 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 Rozencwaig, MD**, is a pioneer in research on melatonin and aging. He practices in Montreal, Canada, as research associate at Montreal General Hospital, Department of Medicine, McGill University.

**Michael D. Seidman, MD, FACS**, is the director of 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 ground-breaking 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 South Florida Bone Marrow Stem Cell Transplant Institute and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.



**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](http://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.

# FISETIN

## The Longevity Flavonoid



**Fisetin**, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a **senolytic** in humans.<sup>1</sup>

In preclinical studies, fisetin:

- Mimics effects of **calorie reduction**<sup>2</sup>
- Targets longevity pathways<sup>2-6</sup>
- Extends lifespan of mice by about **10%**<sup>7</sup>
- Removes **senescent** cells through **senolytic** action<sup>7</sup>
- Suppresses excess **mTOR** activation<sup>8</sup>

**Fisetin** is poorly *absorbed* due to its breakdown in the small intestines.

**Bio-Fisetin** solves this problem by enclosing **fisetin** with a compound from the fenugreek herb.

A **human** trial showed **bioavailability** of this **new fisetin** compound increased up to **25 times** compared to fisetin by itself.<sup>9</sup>

Just **one** capsule daily of **Bio-Fisetin** helps manage **senescent cells** and may support overall longevity.

### References

1. Available at: <https://www.mayo.edu/research/clinical-trials/cls-20438802>. Accessed June 22, 2020.
2. *Life Sci.* 2018 Jan 15;193:171-9.
3. *Mini Rev Med Chem.* 2018;18(13):1151-7.
4. *Nutr Res Pract.* 2017 Oct;11(5):430-4.
5. *Biochem Biophys Res Commun.* 2015 Nov 27;467(4):638-44.
6. *Int Immunopharmacol.* 2017 Apr;45:135-47.
7. *EBioMedicine.* 2018 Oct;36:18-28.
8. *J Nutr Biochem.* 2013 Aug;24(8):1547-54.
9. Manufacturer's study (in press for future publication). 2020.



**Item #02414** • 30 vegetarian capsules

1 bottle **\$11.25** • 4 bottles \$10 each



For full product description and to order **Bio-Fisetin**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)



# Heart Attack Makes Deadly Comeback



WILLIAM FALOON

Do you remember how prevalent **heart attacks** and **strokes** used to be in the **1960s**?

Acute **cardiovascular death** was so common that corporations faced management crises as key executives perished from **heart attacks**.

One of medicine's great achievements has been slashing deaths from **heart attack** and **stroke**.

The slides on this page demonstrate remarkable decreases in cardiovascular deaths that have occurred in recent decades.

I use these slides in live presentations to demonstrate how technology is **winning the war** against degenerative aging.

Sadly, a prediction made by many experts has transformed into tragic reality.

Instead of cardiovascular deaths continuing to plummet as they have over the past **60 years**, they are increasing in middle-aged Americans.

In some cases, older parents today are seeing their middle-age children perish from **preventable** vascular disorders.

The reasons are not surprising.

An underlying cause is an **obesity** and **type II diabetes** epidemic that is offsetting robust gains made against **cardiovascular diseases** in past decades.

The encouraging news is that aging individuals can garner significant **protection** by following proven **cardiovascular risk reduction** behaviors.

Those who fail to measure and correct **artery-clogging** factors are at **high** risk of **heart disease** and **stroke**.

*Life Extension*<sup>®</sup> readers have **annual blood tests** to take corrective actions before chest pain, paralysis, or death by **arterial blockage** manifests.

This article provides a wealth of published data about how to slash one's risk of suffering a crippling or lethal cardiovascular event.

## Enormous Decrease in Cardiovascular Deaths

Between 1980 and 2014

**-50%**

Decrease in Deaths  
from Cardiovascular Disease

Trends and Patterns of Geographic Variation in Cardiovascular Mortality Among US Counties, 1980-2014. *JAMA*. 2017 May 16;317(19):1976-92.

## Sharp Decline in Heart Failure Death Rates

Clinical trials spanning  
1995 to 2014 show:

**44%** decline of sudden death  
in heart failure patients.

A leading cause of age-related  
death markedly reduced in just 19 years!

Declining Risk of Sudden Death in Heart Failure. *N Engl J Med*. 2017 Jul 6;377(1):41-51.



America's **heart attack** epidemic peaked in **1968** and steadily declined as more people understood the **artery-clogging** role of poor **dietary** and **lifestyle** behaviors.

Cardiovascular risk plummeted in response to:<sup>1-7</sup>

- Sharp drop in **tobacco** use,
- Improved **emergency** responses,
- Near perfection of **angioplasty** and **stenting**,
- Huge drop in LDL-related **blood lipids** resulting from changes in dietary patterns and advancements in pharmacology,
- Use of **aspirin** for secondary prevention (reduction in heart attack or stroke *after* having had a prior event), and
- Reduced systolic **blood pressure** targets.

There has also been a **20-fold** increased intake of **dietary supplements** (like **vitamin D** and **CoQ10**).

In a remarkable accomplishment, **cardiovascular disease** mortality declined by around **70%** over the past 60 years.<sup>7-10</sup>

This trend of reduced **cardiovascular mortality** has now turned in the wrong direction.

The prime culprit is record numbers of American adults who are **overweight** or **obese**. This has translated into...

## A Resurgence of Cardiovascular Disease

Instead of continuing to decline in prevalence, we are seeing progress grind to a virtual halt.

For people aged **45** to **64**, cardiovascular mortality increased during the years **2011** to **2017**.<sup>11</sup> This **death rate** increase represents a reversal of what had been sharp declines in heart attacks and ischemic strokes that occurred in previous decades.

These deadly trends correlate with rising levels of obesity, type II diabetes and blood pressure. Here are current statistics in the United States:<sup>12-14</sup>

- Approximately **40%** of adults are clinically obese.
- Over **30%** are overweight.
- Approximately **10.5%** of adults have diabetes, and
- More than **20%** of those with diabetes don't know they have it.
- Approximately **46%** of American adults have **hypertension** often caused by excess body weight.

## Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among U.S. Adults

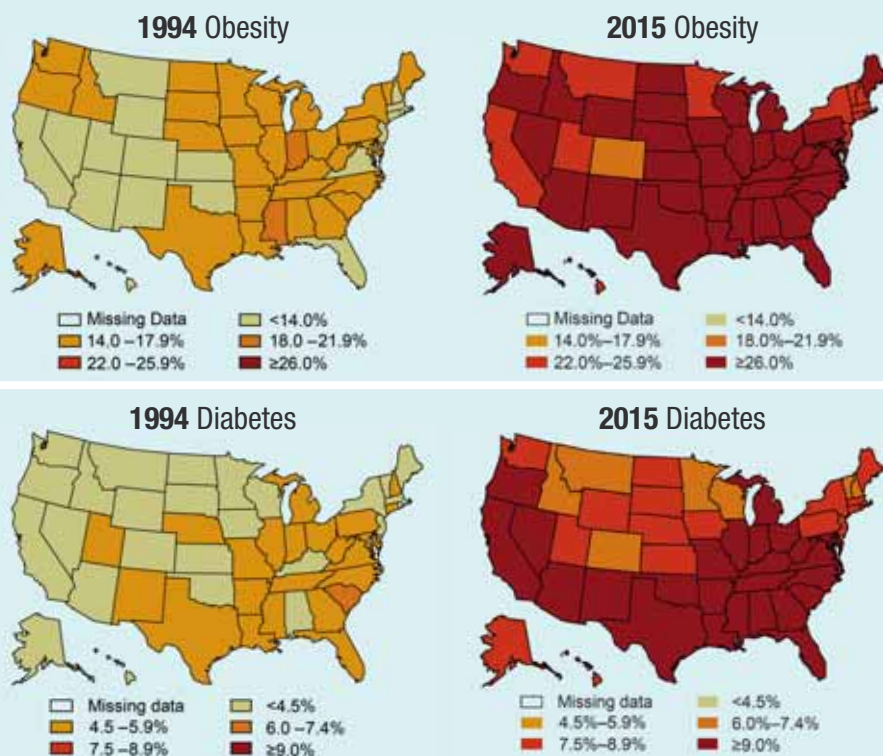
These maps reveal striking increases in **obesity** (BMI  $\geq 30$  kg/m<sup>2</sup>) and **diabetes** that occurred between **1994** and **2015**. This is not mere correlation but reflective of the causative impact of excess body weight on one's ability to maintain optimal (lower reference range) fasting insulin and glucose blood levels.

The material is available on the agency website at no charge.

Reference to specific commercial products, manufacturers, companies, or trademarks does not constitute its endorsement or recommendation by the U.S. Government, Department of Health and Human Services, or Centers for Disease Control and Prevention.

Content source:

Centers for Disease Control and Prevention.  
[https://www.cdc.gov/diabetes/statistics/slides/maps\\_diabetesobesity\\_trends.pdf](https://www.cdc.gov/diabetes/statistics/slides/maps_diabetesobesity_trends.pdf)







## More Heart Failure Deaths

Deaths from heart failure began a steep decline **25 years ago** but began surging higher nine years ago as the population ages and the health of younger individuals worsens.

Between **2011** and **2017**, the death rate from **heart failure** increased **20.7%** and will likely keep climbing sharply, according to a study published in the *JAMA Cardiology*.<sup>21</sup>

The study attributed the resurgence in **heart failure deaths** to the aging population, along with *higher* rates of **obesity** and **diabetes**, including in people under age 65.

The reprint on the left side page shows maps from the **Centers for Disease Control and Prevention**.

They depict an outbreak of **obesity** and **type II diabetes** beginning in **1994** whose impact on **cardiovascular disease incidence** is now manifesting into deadly reality.

## A Ticking Time Bomb

What the maps on the facing page don't reveal is the number of **undiagnosed** diabetics, which is **astonomical** based on today's surging **obesity** epidemic.

These maps also don't consider a position that **Life Extension**® took in the early **1980s** that the concept of "**prediabetes**" is highly misleading.

That is because damage to eyes (retinopathy), kidneys (nephropathy), and nerves (neuropathy) begins *before* the onset of full-blown **diabetes**.

Our position has been validated in dozens of studies showing that damage to blood vessels, nerves, kidneys, and eyes accumulates with *suboptimal* **glycemic control** *before* full-blown **type II diabetes** is diagnosed.<sup>15-20</sup>

To put this into numerical perspective, conventional medicine guidelines in the **1980s** diagnosed **type II diabetes** when **fasting glucose** reached **140 mg/dL** (on two occasions).

**Life Extension**® vehemently argued that any **fasting glucose** reading over **100 mg/dL** increased one's risk of developing diabetes, as well as silent damage to blood vessels, nerves, eyes, and kidneys.

For decades, we urged our readers to keep their fasting glucose between **70-85 mg/dL**.

## Obesity Surges

A startling **72%** of Americans are **overweight** or **obese**.<sup>12</sup>

The average person's glycemic **blood markers** (hemoglobin A1c, insulin and glucose) today are at frighteningly high levels.

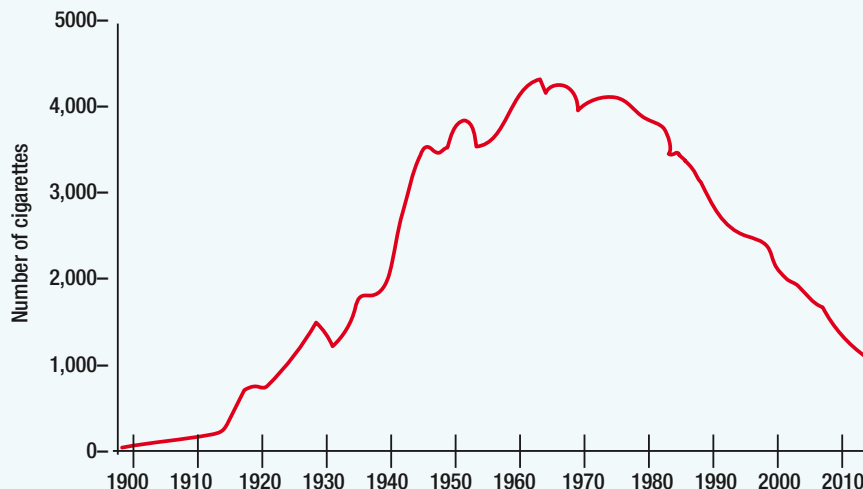
I analogize this ticking **diabetic time bomb** to how **lung cancer deaths** did not sharply increase until **30 years after** **cigarette** smoking became prevalent after year 1900.

We are now about **27 years** into a spiraling rise of **obesity prevalence**. The pathologic impact is being demonstrated by increased **heart disease deaths** in middle-aged Americans.<sup>22</sup>

You don't have to be a victim, even if you are in the diabetic or overweight category.

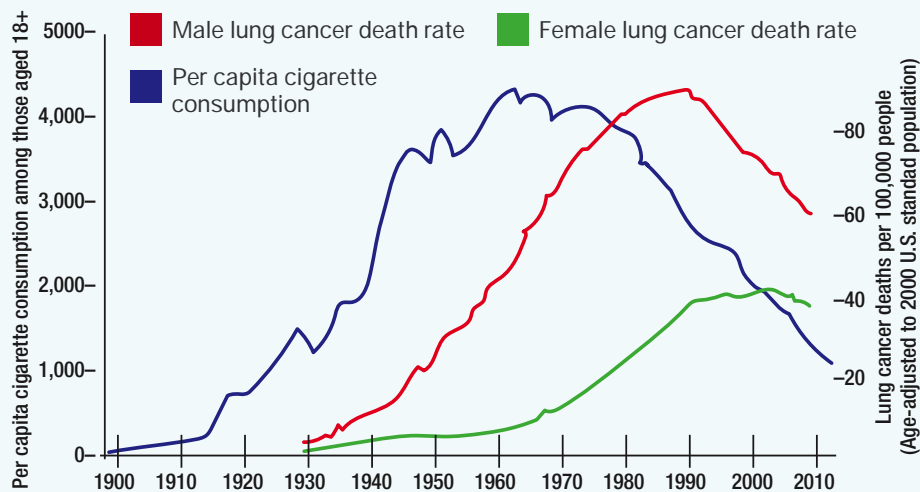
## Cigarette Mortality Trends Relate to Today's Obesity Crisis

### Rise and Fall of Cigarette Smoking 1900-2013



Department of Health & human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. 2014.

### Lung Cancer Death Rates Surged 30 Years After Cigarette Growth



Death rates source: US Mortality Data, 1960-2010, US Mortality Volumes, 1930-1959, National Center for Health Statistics, Centers for Disease Control and Prevention. Cigarette consumption source: US Department of Agriculture, 1900-2007

**Cigarette smoking** was rare before year 1900, but sharply increased thereafter. **Lung cancer deaths** did not begin to surge until around 1930 and continued increasing up until 1990.

The delay in **lung cancer deaths** (from 1900 to 1930) occurred while cigarette-smoking rates were surging. The situation reversed when cigarette smoking began declining around 1965, but lung cancer deaths kept rising and did not

peak until around 1990. These delays reflect the number of years required for cigarette smoking to cause lung cancer. There are also adverse effects of *prior* smoking on **lung cancer** incidence.

A similar situation exists today with **overweight** and **obese** individuals who face short- and long-term health issues because of their **excess weight**.



## Simple Steps Yield Huge Benefits

In response to the plague of **diabetic disorders** striking Americans, several studies were initiated to evaluate whether **cardiovascular events** could be reduced with modest risk-factor changes.

When *only* aggressive **glycemic control** is instituted in **type II diabetics**, there are usually negligible reductions in heart attack and stroke risk.

This is not surprising when considering that a **diagnosis** of **diabetes** often occurs with other co-morbid conditions like hypertension and elevated lipids.

Published data show that when diabetics control other risk factors, like high blood pressure and elevated LDL cholesterol, there are marked reductions in cardiovascular risk.

For example, a group of 2,018 diabetics were treated to achieve safer ranges of **blood pressure**, **hemoglobin A1c** (blood marker of long-term **glucose** control) and **LDL cholesterol**.<sup>23</sup>

In those who achieved one or more of the three targeted ranges of:

- **Blood pressure**
- **LDL cholesterol**
- **Hemoglobin A1c...**

...there was an incremental lower adjusted rate of cardiovascular events. In other words, with each additional treatment goal met, cardiovascular risk decreased further.

The chart below shows the **percent of risk reduction** in response to targeting one risk factor (such as blood pressure), two risk factors, or all three risk factors (**blood pressure**, **LDL**, and **hemoglobin A1c**) vs. none:

| Targeting →                   | One Risk Factor | Two Risk Factors                  | Three Risk Factors |
|-------------------------------|-----------------|-----------------------------------|--------------------|
| Cardiovascular Disease Events | -36%            | -52%<br>(Risk <u>reductions</u> ) | -62%               |
| Coronary Heart Disease Events | -41%            | -56%<br>(Risk <u>reductions</u> ) | -60%               |

This table shows a **60%** coronary-event risk reduction when all three risk factors are controlled.

This prompted the study's authors to note how uncommon it is for **diabetics** to have all three risk factors in safe ranges.

They concluded that **optimization** of these risk factors is:

*"...associated with substantially lower risk of coronary heart disease and cardiovascular disease."*

**Cardiovascular disease** events include **stroke** and **heart attack**.

This study indicates that many lives can be spared if basic, conventional risk factors, especially blood pressure and lipids are better controlled.

## Critical Need of Comprehensive Therapy

There is a lack of consistent data on treating diabetics with **intensive glycemic control** alone.

While **aggressive glycemic control** by itself lowers risk of **kidney failure**, **neuropathy**, and **retinopathy**, the risk of **heart attack** and **stroke** are typically not reduced.

For example, a clinical trial of Danish **type II diabetics** compared intensive **multi-modal** therapy to **conventional therapy** for a mean treatment period of 7.8 years.<sup>24</sup>

The **intensive therapy** targets were:

| Blood Marker      | Intensive Therapy Targets |
|-------------------|---------------------------|
| Hemoglobin A1c    | Under <b>6.5%</b>         |
| Total Cholesterol | Under <b>175 mg/dL</b>    |
| Triglycerides     | Under <b>150 mg/dL</b>    |
| Blood Pressure    | Under <b>130/80 mmHg</b>  |

The **intensive, comprehensive therapy** group had a **57%** reduction in **cardiovascular disease death** and a **59%** reduction in **cardiovascular disease events**.

A much larger, five-year study of 859,617 diabetic adults in the United States showed inadequate risk factor control to be responsible for **11% to 34%** of **cardiovascular disease events**.<sup>25</sup>

The defined "**risk factors**" in this five-year study were **blood pressure**, **LDL**, **hemoglobin A1c**, and **smoking**.

Another study looked at similar risk factors for American **type II diabetics** and projected that controlling all of them would prevent **35%** of **coronary heart disease events** in **men** and **45%** in **women**.<sup>26</sup> The authors concluded:

*"...a significant proportion of coronary heart disease events in adults with type II diabetes could be prevented from composite control of risk factors often not at goal."*<sup>26</sup>

The data relating to heart attack and stroke prevention reveal that **diabetics** need to control more than just **glucose** and **hemoglobin A1c** levels.

## What About Obese Individuals?

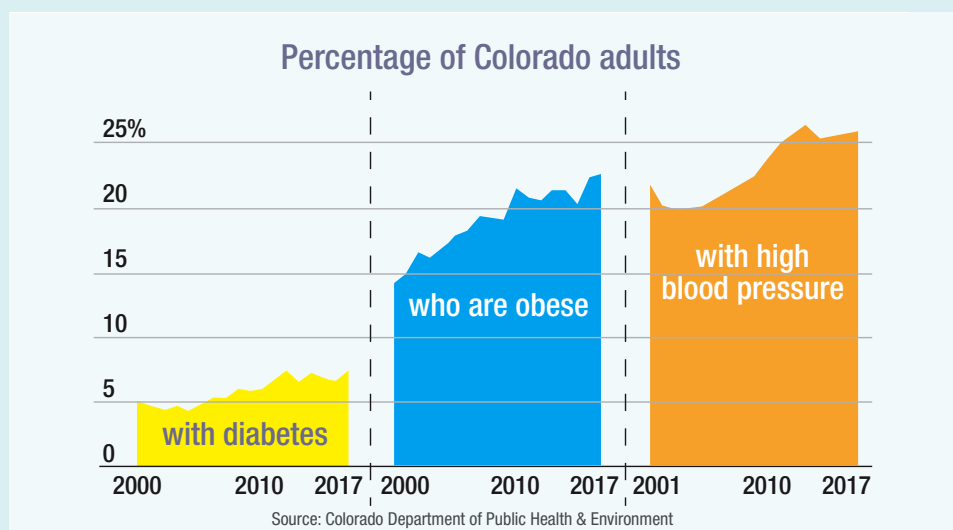
In a **2016** report published in **JAMA**, Johns Hopkins researchers followed a group of 13,730 people for about 23 years.<sup>27</sup>

**Body Mass Index** of this large study group ranged from normal weight (BMI **18.5 to <25 kg/m<sup>2</sup>**) to severely obese (equal to or more than **35 kg/m<sup>2</sup>**).

After controlling for factors like age, smoking status, and physical activity, severely **obese** subjects had about a **two-fold** higher risk of **coronary heart disease** and **ischemic stroke**.

The box below reveals the surge in cardiovascular risk factors in **Colorado**, a state associated with healthier behavioral patterns than the southeast United States.

## Heart Disease in Middle-Aged Men



A front-page article in the *Wall Street Journal* described surging numbers of **heart attacks** occurring in people living in **Colorado**, many of whom are physically active, but nonetheless have multiple **cardiovascular risk factors**.<sup>28</sup>

The article described many victims including a 55-year-old man who died of an acute heart attack. This prompted his group of friends to have checkups. Eleven of his friends had **arterial issues** and needed stents or other therapy.

Six of these 11 men with silent **coronary artery disease** played on an amateur hockey team. This was common amongst other Coloradans who were **physically active**, but failed to control blood pressure, lipids/glucose, body weight and other heart-health practices.

A startling statistic discussed in the *Wall Street Journal* article portends a frightening future: More than **25%** of elementary-school children

screened in the **2018-2019** school year were overweight or **obese**. And **19.2%** had borderline or high cholesterol.

High LDL cholesterol and its atherogenic sub-fractions, like **apolipoprotein B**, in early life predispose to vascular diseases in mid- to later life.<sup>29,30</sup>

A Colorado Springs cardiologist was quoted as regularly seeing men and women in their **30s** and **40s** with heart problems, such as high blood pressure, irregular heart rhythms, and heart attacks. This doctor noted how **rare** this was when he began his cardiology practice in the early **2000s**.

**Cardiovascular screening** is now urged by public health officials, which is what most readers of *Life Extension*<sup>®</sup> magazine do each year with comprehensive **blood tests**.



When the researchers of this 2016 *JAMA* study controlled for:

- Diabetes,
- Hypertension,
- Cholesterol/triglycerides, and
- Kidney function...

→ ...there was no longer a difference between **obese** and **normal weight** people for risk of **coronary heart disease** and **stroke**.

While this is encouraging, the researchers discovered that severely **obese** individuals had a nearly **four-fold increase** in **heart failure**, even when conventional risk factors (like blood pressure, glucose, and lipids) were considered.

The researchers pointed to evidence that excess **body weight** increases the heart's workload. They also pointed to the role of fat cells in the belly (abdomen) releasing **inflammatory** factors that further damage the heart.

None of these studies measured critical additional blood factors that contribute to coronary artery disease, ischemic stroke, and heart failure.

If these added artery-clogging factors (like **C-reactive protein** and **apolipoprotein B**) were measured in type II diabetics and/or obese individuals, there would be an opportunity for more substantial reductions in cardiovascular diseases.

### Too Many Needless Deaths

The studies reported in this editorial looked at **conventional** cardiovascular risk factors in overweight and diabetic individuals.

Up to **62%** lower rates of **cardiovascular events** occurred in diabetics who achieved better control over their blood pressure, lipids, and blood sugar.

But what about the **38%** risk for cardiovascular events that remained, even after controlling conventional risk factors?

As a reader of this magazine, you know there are about a dozen additional cardiovascular factors such as **homocysteine**, **apolipoprotein B**, and **hormone imbalances**.

These **blood markers** should be measured, and efforts made to reduce them to safe ranges. This will likely yield greater reductions in cardiovascular events.

### What Are Optimal Blood Levels of Apolipoprotein B?

Those with *higher* levels of a blood marker called **apolipoprotein B** are at greater risk for cardiovascular events.

For people without preexisting vascular disease, diabetes or other risk factors, optimal apolipoprotein B is under 80 mg/dL.

Those at high **arterial blockage** risk should attempt to reduce **apolipoprotein B** to under **60 mg/dL**. This will likely require dietary modifications and use of certain drug therapies.

When it comes to ideal **apolipoprotein B** levels, the lower the better. The following reference ranges reflect **Life Extension's** general guidance for **apolipoprotein B** status when you get your blood test results back:

|            |                                                                                                                                                               |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Optimal    | <b>&lt;80 mg/dL</b><br>(For those without significant vascular risk factors)<br><br><b>&lt;60 mg/dL</b><br>(For those with significant vascular risk factors) |
| Borderline | <b>80-99 mg/dL</b>                                                                                                                                            |
| High       | <b>100-120 mg/dL</b>                                                                                                                                          |
| Very High  | <b>≥120 mg/dL</b>                                                                                                                                             |

If your **apolipoprotein B** levels are not in **optimal** ranges, there are natural and pharmaceutical approaches to lowering them.

Now that cardiovascular disease is making a deadly comeback, it is imperative to have **comprehensive blood tests**, which is what most readers of this magazine do each year when they order the popular **Male** or **Female Panels**.

### Annual Lab Test Sale

The high cost of **blood tests** prevents many people from testing for, and then optimizing, their cardiovascular risk factors.

We at **Life Extension®** recognized this problem **25 years ago**.

Back in those days, many of our readers were challenged to persuade their doctors to order tests like **homocysteine** and **hemoglobin A1c**.

The price of blood tests in the **1990s** was far **higher** than today.

This motivated us to develop a program that enables readers to order **low-cost** tests and then visit a **blood draw station** in their area at their convenience.

Blood test results come back in less than a week and are promptly **emailed and mailed**.

If there are any questions, our **Wellness Specialists** are available to assist, seven days a week, at no charge.

Once a year we **discount** prices of all lab tests. This serves as a convenient reminder to have one's annual assessments performed at the lowest prices.

The extensive array of blood tests included in the **Male** and **Female Panels** can be viewed on the page to your right.

The discounted price for this year's **Male** or **Female Blood Panels** (that includes **apolipoprotein B** and **newly added ferritin**) is **\$224**. It's a bit higher now than in years past, but it includes more important measures that cost over **\$2,000** at commercial labs.

To order the Male or Female Panel today, call **1-800-208-3444** or log on to: [www.LifeExtension.com/blood](http://www.LifeExtension.com/blood)

You can then visit a blood draw station we refer you to in your area at your convenience.

For longer life,



William Faloon, Co-Founder  
Life Extension Buyers Club

*(References can be found on page 16.)*

## Blood Tests Identify Reversible Cancer Risks

Most people have annual blood tests to check for cardiovascular risk factors like total **cholesterol**, **LDL** and **triglycerides**.

What few realize is that other blood tests such as **fasting insulin**,<sup>31-34</sup> **glucose**,<sup>35-39</sup> and **C-reactive protein**<sup>40-45</sup> are robustly associated with one's future **cancer risk**.

Those who procrastinate about having **comprehensive blood tests** miss out on opportunities to correct risk factors before onset of cancer, dementia, kidney failure and cardiovascular diseases.

### Blood Test Super Sale

Since our founding over 40 years ago, **Life Extension®** has urged its readers to have annual **blood tests**.

The number of lives saved by our recommendations is huge, including men diagnosed with **early-stage prostate cancer** who are readily cured. And many of today's curative prostate treatments have far fewer side effects.

We have identified tens of thousands of people with elevated **cardiovascular risk** markers, allowing them to take corrective measures before an ischemic **stroke** or **heart attack** strikes.

The retail price throughout the year for these comprehensive **Male** or **Female Panels** is **\$299**. These same tests at commercial labs cost over **\$2,000**.

Just once a year, we discount the prices of all blood tests, enabling readers to obtain the **Male** or **Female Blood Test Panels** for only **\$224**.

This represents almost a **90% savings** compared to commercial lab prices.

To order a **Male** and/or **Female Panel** at the year's lowest prices, call **1-800-208-3444** (24 hours) or log on to: [www.LifeExtension.com/blood](http://www.LifeExtension.com/blood)



# Comprehensive Blood Tests at Low Lab Sale Prices

Commercial labs charge **over \$2,000** for blood tests needed to evaluate cardiac, inflammatory, immune, and other degenerative risk factors.

**Life Extension®** offers these same tests for **\$224** when the **Male** or **Female Panel** is ordered during the annual **Lab Test Sale**. This represents a savings up to **90%** compared to commercial labs.

This year **ferritin** has been added to the **Male** and **Female Panels** at no additional charge.

## MALE PANEL

### METABOLIC PROFILE

Glucose

Insulin

Hemoglobin A1c

**NEW** Ferritin (measure of iron status)

Serum Magnesium

**Kidney function tests:** creatinine, BUN, uric acid, BUN/creatinine ratio

**Liver function tests:** AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

**Blood minerals:** calcium, potassium, phosphorus, sodium, chloride, iron

**Blood proteins:** albumin, globulin, total protein, albumin/globulin ratio

### CARDIAC MARKERS

Apolipoprotein B (ApoB)

Homocysteine

C-Reactive Protein (high sensitivity)

### LIPID PROFILE

Total Cholesterol

LDL (low-density lipoprotein)

HDL (high-density lipoprotein)

Triglycerides

### COMPLETE BLOOD COUNT (CBC)

**Red Blood Cell count including:** hemoglobin, hematocrit, MCV, MCH, MCHC, RDW

**White Blood Cell count including:** lymphocytes, monocytes, eosinophils, neutrophils, basophils

Platelet count

### CANCER MARKER

PSA (Prostate Specific Antigen)

### HORMONES

Free and Total Testosterone

DHEA-S

Estradiol (an estrogen)

TSH (thyroid function)

Vitamin D

## FEMALE PANEL

### METABOLIC PROFILE

Glucose

Insulin

Hemoglobin A1c

**NEW** Ferritin (measure of iron status)

Serum Magnesium

**Kidney function tests:** creatinine, BUN, uric acid, BUN/creatinine ratio

**Liver function tests:** AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

**Blood minerals:** calcium, potassium, phosphorus, sodium, chloride, iron

**Blood proteins:** albumin, globulin, total protein, albumin/globulin ratio

### CARDIAC MARKERS

Apolipoprotein B (ApoB)

Homocysteine

C-Reactive Protein (high sensitivity)

### LIPID PROFILE

Total Cholesterol

LDL (low-density lipoprotein)

HDL (high-density lipoprotein)

Triglycerides

### COMPLETE BLOOD COUNT (CBC)

**Red Blood Cell count including:** hemoglobin, hematocrit, MCV, MCH, MCHC, RDW

**White Blood Cell count including:** lymphocytes, monocytes, eosinophils, neutrophils, basophils

Platelet count

### HORMONES

Progesterone

Estradiol (an estrogen)

Free and Total Testosterone

DHEA-S

TSH (thyroid function)

Vitamin D

## LAB TEST SALE • ENDS JULY 12, 2021

Regular price: **\$299**

Sale Price: **\$224**

To obtain these comprehensive **Male** or **Female Panels** at these low prices, call **1-800-208-3444** or log on to [www.LifeExtension.com/blood](http://www.LifeExtension.com/blood) to order your requisition forms.

After you order and receive our form, you can visit a blood-draw facility we suggest at your convenience in your area or the **Life Extension Nutrition Center** in Ft. Lauderdale.

Lab tests are available in the continental United States and Anchorage, AK, only. Not available in Maryland. Restrictions apply in MA, NY, NJ, and RI. Kits not available in PA. The Blood Test Super Sale expires on **July 12, 2021**.



## References

- Carroll MD, Lacher DA, Sorlie PD, et al. Trends in serum lipids and lipoproteins of adults, 1960-2002. *JAMA*. 2005 Oct 12;294(14):1773-81.
- Collaboration NCDRF. Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. *Lancet*. 2017 Jan 7;389(10064):37-55.
- Hopstock LA, Bonaa KH, Eggen AE, et al. Longitudinal and secular trends in total cholesterol levels and impact of lipid-lowering drug use among Norwegian women and men born in 1905-1977 in the population-based Tromsø Study 1979-2016. *BMJ Open*. 2017 Aug 21;7(8):e015001.
- CDC. Centers for Disease Control and Prevention. Achievements in Public Health, 1900-1999: Tobacco Use — United States, 1900-1999. *MMWR*. 1999;48(43):986-93.
- Arnett DK, Blumenthal RS, Albert MA, et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2019 Sep 10;140(11):e596-e646.
- Ridker PM, Cook NR, Lee IM, et al. A randomized trial of low-dose aspirin in the primary prevention of cardiovascular disease in women. *N Engl J Med*. 2005 Mar 31;352(13):1293-304.
- Mensah GA, Wei GS, Sorlie PD, et al. Decline in Cardiovascular Mortality: Possible Causes and Implications. *Circ Res*. 2017 Jan 20;120(2):366-80.
- Available at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4830a1.htm>. Accessed March 2, 2021.
- Hartley A, Marshall DC, Saliccioli JD, et al. Trends in Mortality From Ischemic Heart Disease and Cerebrovascular Disease in Europe: 1980 to 2009. *Circulation*. 2016 May 17;133(20):1916-26.
- Moran AE, Forouzanfar MH, Roth GA, et al. Temporal trends in ischemic heart disease mortality in 21 world regions, 1980 to 2010: the Global Burden of Disease 2010 study. *Circulation*. 2014 Apr 8;129(14):1483-92.
- Available at: [https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68\\_05-508.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_05-508.pdf). Accessed March 2, 2021.
- Available at: <https://www.cdc.gov/nchs/fastats/obesity-overweight.htm>. Accessed February 28, 2021.
- Available at: <https://www.cdc.gov/diabetes/data/statistics/statistics-report.html>. Accessed March 2, 2021.
- Benjamin EJ, Muntner P, Alonso A, et al. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. *Circulation*. 2019 Mar 5;139(10):e56-e528.
- Prevalence of Peripheral Neuropathy in Prediabetes. *Diabetes*. 2018;67(Supplement 1):552-P.
- Available at: [https://www.hopkinsmedicine.org/news/media/releases/small\\_nerve\\_fibers\\_defy\\_neuropathy\\_conventions](https://www.hopkinsmedicine.org/news/media/releases/small_nerve_fibers_defy_neuropathy_conventions). Accessed March 2, 2021.
- Melson T, Schei J, Stefansson VT, et al. Prediabetes and Risk of Glomerular Hyperfiltration and Albuminuria in the General Nondiabetic Population: A Prospective Cohort Study. *Am J Kidney Dis*. 2016 Jun;67(6):841-50.
- Tabak AG, Herder C, Rathmann W, et al. Prediabetes: a high-risk state for diabetes development. *Lancet*. 2012 Jun 16;379(9833):2279-90.
- Plantinga LC, Crews DC, Coresh J, et al. Prevalence of chronic kidney disease in US adults with undiagnosed diabetes or prediabetes. *Clin J Am Soc Nephrol*. 2010 Apr;5(4):673-82.
- Available at: <https://www.medicalnewstoday.com/articles/304528.php>. Accessed March 5, 2021.
- Sidney S, Go AS, Jaffe MG, et al. Association Between Aging of the US Population and Heart Disease Mortality From 2011 to 2017. *JAMA Cardiology*. 2019;4(12):1280-6.
- Curtin SC. Trends in Cancer and Heart Disease Death Rates Among Adults Aged 45-64: United States, 1999-2017. *Natl Vital Stat Rep*. 2019 May;68(5):1-9.
- Wong ND, Zhao Y, Patel R, et al. Cardiovascular Risk Factor Targets and Cardiovascular Disease Event Risk in Diabetes: A Pooling Project of the Atherosclerosis Risk in Communities Study, Multi-Ethnic Study of Atherosclerosis, and Jackson Heart Study. *Diabetes Care*. 2016 May;39(5):668-76.
- Gaede P, Lund-Andersen H, Parving HH, et al. Effect of a multifactorial intervention on mortality in type 2 diabetes. *N Engl J Med*. 2008 Feb 7;358(6):580-91.
- Vazquez-Benitez G, Desai JR, Xu S, et al. Preventable major cardiovascular events associated with uncontrolled glucose, blood pressure, and lipids and active smoking in adults with diabetes with and without cardiovascular disease: a contemporary analysis. *Diabetes Care*. 2015 May;38(5):905-12.
- Wong ND, Patao C, Malik S, et al. Preventable coronary heart disease events from control of cardiovascular risk factors in US adults with diabetes (projections from utilizing the UKPDS risk engine). *Am J Cardiol*. 2014 Apr 15;113(8):1356-61.
- Ndumele CE, Matsushita K, Lazo M, et al. Obesity and Subtypes of Incident Cardiovascular Disease. *J Am Heart Assoc*. 2016 Jul 28;5(8).
- Available at: <https://www.wsj.com/articles/heart-disease-strikes-back-across-the-u-s-even-in-healthy-places-11579015880>. Accessed March 2, 2021.
- Robinson JG, Williams KJ, Gidding S, et al. Eradicating the Burden of Atherosclerotic Cardiovascular Disease by Lowering Apolipoprotein B Lipoproteins Earlier in Life. *Journal of the American Heart Association*. 2018;7(20):e009778-e.
- Pletcher MJ, Bibbins-Domingo K, Liu K, et al. Nonoptimal lipids commonly present in young adults and coronary calcium later in life: the CARDIA (Coronary Artery Risk Development in Young Adults) study. *Ann Intern Med*. 2010 Aug 3;153(3):137-46.
- Stolzenberg-Solomon RZ, Graubard BI, Chari S, et al. Insulin, glucose, insulin resistance, and pancreatic cancer in male smokers. *JAMA*. 2005 Dec 14;294(22):2872-8.
- Shu X, Wu L, Khankari NK, et al. Associations of obesity and circulating insulin and glucose with breast cancer risk: a Mendelian randomization analysis. *Int J Epidemiol*. 2019 Jun 1;48(3):795-806.
- Ghanavati M, Rahmani J, Rinaldi G, et al. Fasting Insulin and Risk of Cancer Related Mortality in Non-diabetic Adults: A Dose-response Meta-analysis of Cohort Studies. *Curr Diabetes Rev*. 2020;16(4):357-63.
- Tsujimoto T, Kajio H, Sugiyama T. Association between hyperinsulinemia and increased risk of cancer death in nonobese and obese people: A population-based observational study. *Int J Cancer*. 2017 Jul 1;141(1):102-11.
- Stattin P, Bjor O, Ferrari P, et al. Prospective study of hyperglycemia and cancer risk. *Diabetes Care*. 2007 Mar;30(3):561-7.
- Michaud DS, Fuchs CS, Liu S, et al. Dietary glycemic load, carbohydrate, sugar, and colorectal cancer risk in men and women. *Cancer Epidemiol Biomarkers Prev*. 2005 Jan;14(1):138-47.
- Gapstur SM, Gann PH, Lowe W, et al. Abnormal glucose metabolism and pancreatic cancer mortality. *Jama*. 2000 May 17;283(19):2552-8.
- Jee SH, Ohrr H, Sull JW, et al. Fasting serum glucose level and cancer risk in Korean men and women. *Jama*. 2005 Jan 12;293(2):194-202.
- Lajous M, Willett W, Lazcano-Ponce E, et al. Glycemic load, glycemic index, and the risk of breast cancer among Mexican women. *Cancer Causes Control*. 2005 Dec;16(10):1165-9.
- Li Y, Zhong X, Cheng G, et al. Hs-CRP and all-cause, cardiovascular, and cancer mortality risk: A meta-analysis. *Atherosclerosis*. 2017 Apr;259:75-82.
- Han Y, Mao F, Wu Y, et al. Prognostic role of C-reactive protein in breast cancer: a systematic review and meta-analysis. *Int J Biol Markers*. 2011 Oct-Dec;26(4):209-15.
- Wang G, Li N, Cao L, et al. Association between the level of high sensitivity C-reactive protein and risk of breast cancer among non-diabetic females: a prospective study in Kailuan group. *Zhonghua Zhong Liu Za Zhi*. 2014 Dec;36(12):944-8.
- Peres LC, Mallen AR, Townsend MK, et al. High Levels of C-Reactive Protein Are Associated with an Increased Risk of Ovarian Cancer: Results from the Ovarian Cancer Cohort Consortium. *Cancer Res*. 2019 Oct 15;79(20):5442-51.
- Pastorino U, Morelli D, Leuzzi G, et al. Baseline and postoperative C-reactive protein levels predict mortality in operable lung cancer. *Eur J Cancer*. 2017 Jul;79:90-7.
- Shrotriya S, Walsh D, Nowacki AS, et al. Serum C-reactive protein is an important and powerful prognostic biomarker in most adult solid tumors. *PLoS One*. 2018;13(8):e0202555.



HEALTHY BONES = HEALTHY HEART



# THREE WAYS TO GET VITAMIN



## SUPER K

**SUPER K** is the best-selling **vitamin K** formula for bone and heart health. It costs only **25 cents** a day and provides in one capsule:

|                                                          |                  |
|----------------------------------------------------------|------------------|
| <b>Vitamin K1</b><br>(converts to K2 in some people)     | <b>1,500 mcg</b> |
| <b>Vitamin K2 (MK-4)</b><br>(for bone & vascular health) | <b>1,000 mcg</b> |
| <b>Vitamin K2 (MK-7)</b><br>(long-acting protection)     | <b>100 mcg</b>   |

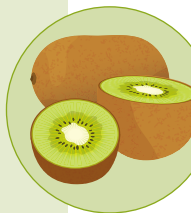


**SUPER K** Item #02334 • 90 softgels  
1 bottle **\$22.50** • 4 bottles \$20.25 each

## SUPER K ELITE

**Super K Elite** provides 2 additional forms of vitamin K and even **higher** potencies of K1, MK4, and MK7. **Super K Elite** costs **60 cents** a day and provides in one capsule:

|                                                            |                  |
|------------------------------------------------------------|------------------|
| <b>Vitamin K1</b><br>(converts to K2 in some people)       | <b>2,000 mcg</b> |
| <b>Vitamin K2 (MK-4)</b><br>(for bone & vascular health)   | <b>1,500 mcg</b> |
| <b>Vitamin K2 (MK-7)</b><br>(long-acting protection)       | <b>181 mcg</b>   |
| <b>Vitamin K2 (MK-9)</b><br>(added cardiovascular support) | <b>43 mcg</b>    |
| <b>Vitamin K2 (MK-6)</b><br>(added cardiovascular support) | <b>11 mcg</b>    |

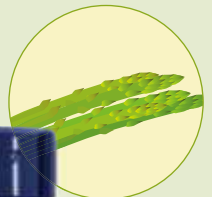


**SUPER K ELITE** Item #02335 • 30 softgels  
1 bottle **\$18** • 4 bottles \$16 each

## MEGA VITAMIN K2

Japanese physicians use **high-dose vitamin K2** for those with challenges in maintaining healthy bone density. **Mega Vitamin K2** costs **95 cents** a day and provides in one daily capsule:

|                                                          |                   |
|----------------------------------------------------------|-------------------|
| <b>Vitamin K2 (MK-4)</b><br>(for bone & vascular health) | <b>45,000 mcg</b> |
|----------------------------------------------------------|-------------------|



**MEGA VITAMIN K2** Item #02417 • 30 capsules  
1 bottle **\$28.50** • 4 bottles \$26 each

For full product description and to order these **VITAMIN K** formulas  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



**CAUTION:** If you are taking anticoagulant or antiplatelet medications, or have a bleeding disorder, consult with your healthcare provider before taking these products.

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.

# RE-ENERGIZE Heart AND Brain Cells

Three Choices of Superior **Ubiquinol CoQ10** Mitochondrial Delivery Systems

100 mg CoQ10



**Item #01426** • 100 mg, 60 softgels

1 bottle **\$46.50**

4 bottles \$39 each

200 mg CoQ10



**Item #01431** • 200 mg, 30 softgels

1 bottle **\$44.25**

4 bottles \$37.50 each

100 mg CoQ10 + 10 mg PQQ



**Item #01733** • 100 mg, 30 softgels

1 bottle **\$37.50**

4 bottles \$30 each

For full product description and to order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support**, or **Super Ubiquinol CoQ10 with PQQ**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://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. These products are not intended to diagnose, treat, cure, or prevent any disease.



# In the News



## Higher Folic Acid Levels Linked to Lower Risk of Erectile Dysfunction

A meta-analysis documented an association between *higher* serum levels of **folic acid** and a lower risk of erectile dysfunction (ED).\*

Researchers selected 6 studies that included 1,842 men.

Pooled data revealed that folic acid levels among men without ED were approximately **3.37 ng/mL** *higher* than levels measured among men with ED.

The folic acid difference between participants with and without ED became greater as severity increased, meaning those with lower folic acid levels exhibited worsening ED.

**Editor's Note:** The authors remarked that folic acid helps normalize homocysteine levels that damage the lining of the arteries. Elevated homocysteine levels also inhibit the formation of nitric oxide in the blood vessel lining, thereby contributing to the risk of ED.

\* *Andrologia*. 2021 Feb 7.

## AMPK Activation Can Help Maintain Muscle Mass

Research conducted at the University of Birmingham in the UK indicates that activation of an energy-sensing enzyme known as AMP-activated protein kinase (**AMPK**) could help people maintain physical function.\*

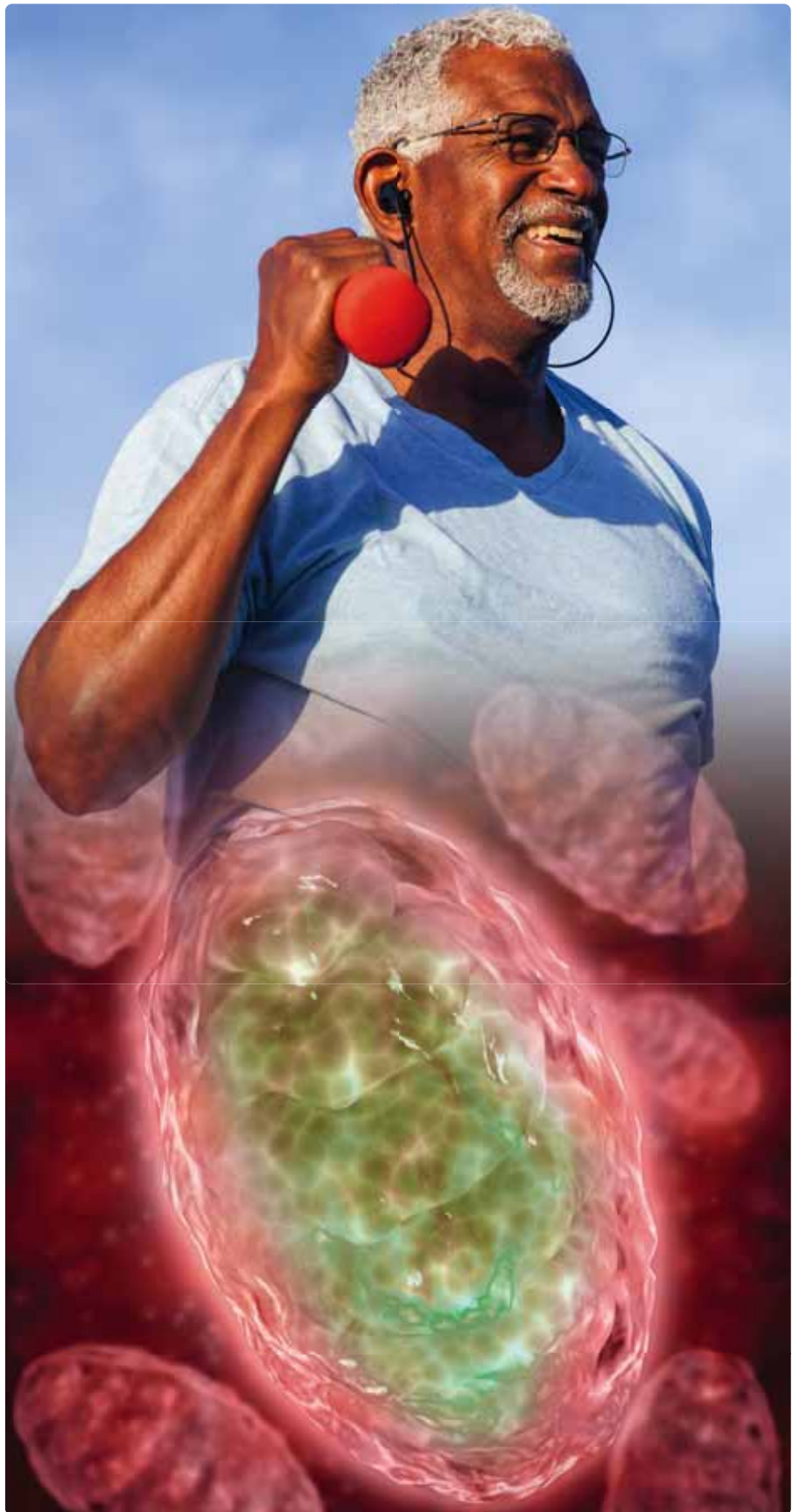
Researchers were able to observe that **AMPK** promotes the breakdown of damaged mitochondria, a process known as mitophagy.

Aged or damaged mitochondria that build up in the muscle cells of older individuals contribute to a decline in muscle function.

“We know that exercise and diet regimes can be used to help people maintain their muscle mass and physical capabilities in later life,” observed lead author Alex Seabright. “But improving our understanding as to why muscle loss occurs with aging will aid the development of targeted pharmacological interventions to help people to stay physically capable for longer.”

**Editor’s Note:** “The rationale for this study stemmed from our lack of current knowledge concerning the molecular mechanisms that underpin mitophagy in skeletal muscle,” the authors stated.

\* *FASEBJ*. 2020 Mar 22; 34(5): 6284–6301.







## CoQ10 Improves Statin Tolerability

Results from a study published in the journal *Drug Design, Development and Therapy* indicate a potential protective effect of **CoQ10** against a side effect induced by statin drugs that would otherwise render treatment intolerable.\*

The randomized trial included 60 participants with unhealthy LDL levels and statin-associated muscle pain.

In addition to **pain** scores, a blood marker (CPK) of **muscle damage** was used to assess **statin intolerance**.

Statin use was discontinued for a month, followed by the reintroduction of **half** the previous statin dose plus **100 mg** CoQ10 or a placebo, daily for three months. Questionnaires concerning pain symptoms were administered at the beginning of the study and at one and three months.

CoQ10 levels were higher and **pain scores** were lower after three months in the CoQ10 group. Pain scores remained essentially the same among those who received the **placebo**.

Higher plasma levels of **CoQ10** were associated with lower levels of **CPK** among participants who received the CoQ10.

**Editor's Note:** The authors remarked that, "CoQ10 was safe and effective in preventing the worsening of the lipid profile that would be expected with a reduced dosage of statin."

\* *Drug Des Devel Ther.* 2019 Oct 21;13:3647-3655.



## Anti-Inflammatories Can Have Antidepressant Effects

Men and women with major depressive symptoms were found to benefit from anti-inflammatory compounds, according to the results of a meta-analysis published in the *Journal of Neurology*.\*

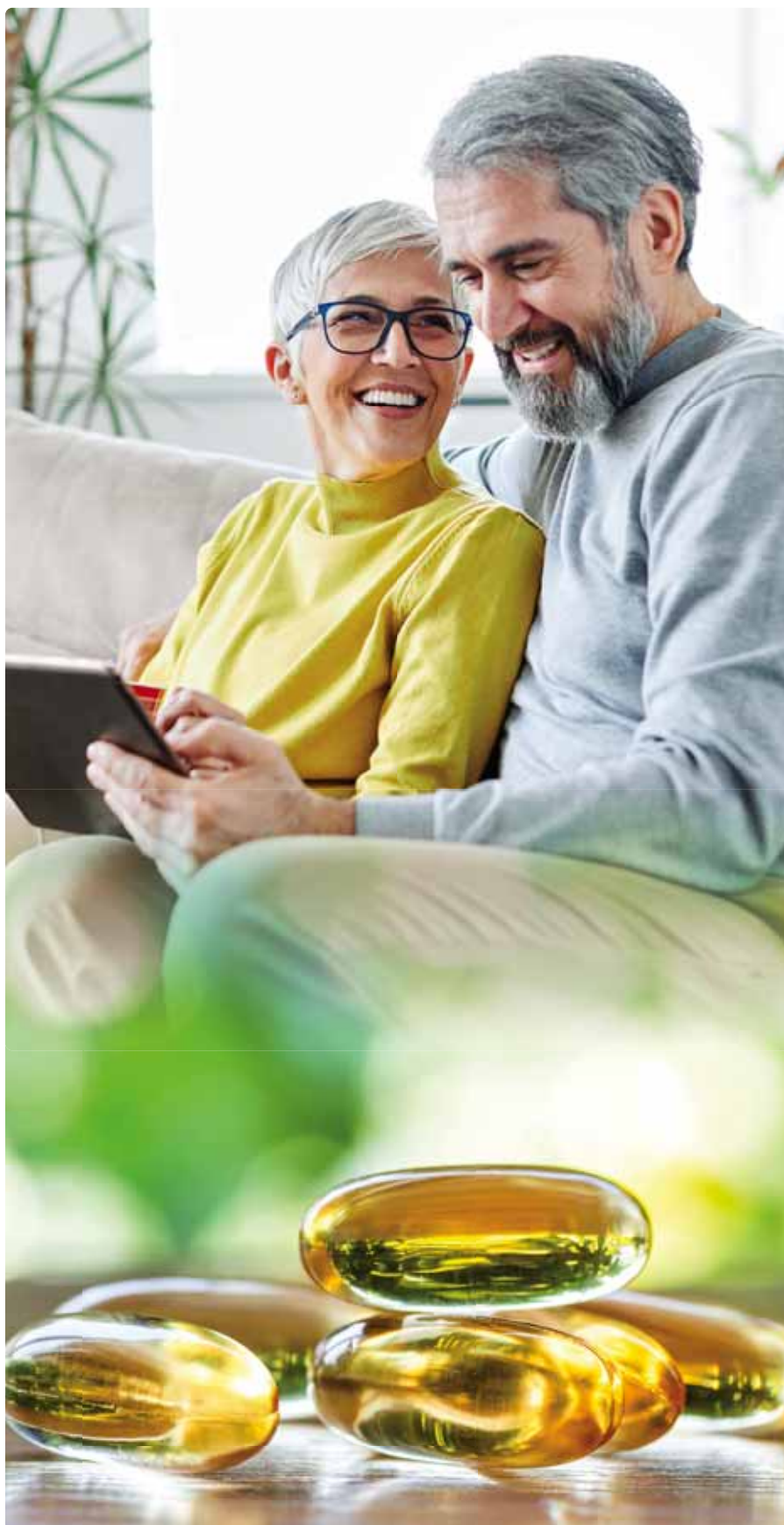
For their analysis, researchers selected 30 randomized, controlled trials that included a total of 1,610 participants. The trials evaluated the effects of nonsteroidal anti-inflammatory drugs (NSAIDs), omega-3 fatty acids, minocycline antibiotics, pioglitazone, modafinil (used in sleep disorders), statin drugs, and N-acetylcysteine, all of which have an anti-inflammatory effect.

Twenty-two trials compared the effects of antidepressant drug therapies plus the anti-inflammatory compounds to antidepressant drug therapy plus a placebo, and eight trials compared the anti-inflammatory compounds alone to a placebo.

Pooling of the results of 26 of the trials revealed a **55% reduction** in depressive scale scores for people who received the anti-inflammatory compounds compared to those who got a placebo. Further analysis determined that NSAIDs, omega-3 fatty acids, statins and minocyclines had the greatest antidepressant effects.

**Editor's Note:** "Our systematic review and meta-analysis suggests that anti-inflammatory agents exert an antidepressant effect in the treatment of major depressive disorder and were generally safe, with rates of adverse effects similar to those of placebo," the authors concluded.

\* *J Neurol Neurosurg Psychiatry*. 2020 Jan;91(1):21-32.





## Prediabetes Linked to Cognitive Decline and Dementia

People with higher than normal blood sugar—called *prediabetes*—are more likely to experience cognitive decline and vascular dementia, according to a study published in *Diabetes, Obesity, and Metabolism*.\*

Researchers analyzed UK Biobank Data from almost 450,000 people averaging 58 years old who underwent an **HbA1c test**, which determines average blood sugar levels over the past two to three months.

Based on these results, they were divided into one of five groups: low-normal blood sugar, normal blood sugar, prediabetes, undiagnosed diabetes, and diabetes. Prediabetes was classified as having a **hemoglobin A1c** (HbA1c) blood test reading of **6.0%-6.5%**. (Ideal **A1c** levels are under **5.5%**.)

Results showed that people with above *normal blood sugar* levels were:

- **42%** more likely to experience **cognitive decline** over four years, and
- **54%** more likely to develop **vascular dementia** over eight years.

Vascular dementia is caused by reduced blood flow to the brain.

People with prediabetes and diabetes had similar rates of cognitive decline (**42%** and **39%** respectively).

MRI brain scans revealed that **prediabetes** was associated with a smaller hippocampus and more strongly associated with having lesions on the brain—both of which are associated with age-related cognitive impairment.

**Editor's Note:** The study authors noted, "Previous research has found a link between poorer cognitive outcomes and diabetes, but our study is the first to investigate how having blood sugar levels that are relatively high—but do not yet constitute diabetes—may affect our brain health."

\* *Diabetes Obes Metab.* 2021;1-10.



# THiNK ZiNC

FOR BONE HEALTH

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

If you don't know by now that zinc promotes a healthy immune response and bone health, it's time to get with the program. This formula gives you **50 mg** of zinc in a convenient, vegetarian capsule. Promotes bone, immune, heart, and neurological health with Zinc Caps. **What a good idea!**



**Item #01813**

50 mg • 90 vegetarian capsules

1 bottle **\$6.75** • 4 bottles \$6 each



For full product description and to order **Zinc Caps** call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

OptiZinc® is a registered trademark of InterHealth Nutritionals, 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.



# 45 Times Greater Bioavailability Curcumin



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

**Item #02407**

500 mg, 60 vegetarian capsules

1 bottle **\$24** • 4 bottles \$22 each



Same 500 mg potency patented turmeric extract with added benefits of ginger and other turmeric actives.

**Item #02324**

500 mg curcumin + gingerol, 30 softgels

1 bottle **\$20** • 4 bottles \$18 each



For full product description and to order  
**Curcumin Elite™** or **Advanced Curcumin Elite™**, call  
1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



# BEAT BELLY FAT WITH **AMPK**



Studies show that *increasing* AMPK activity encourages cells to stop storing fat.

AMPK Metabolic Activator helps trigger cellular AMPK, enabling your body to burn unwanted fat—particularly around your abdomen.

**Item #02207 • 30 vegetarian tablets**

1 bottle **\$28.50** • 4 bottles **\$24 each**

For full product description and to order **AMPK Metabolic Activator**, call 1-800-544-4440 or visit [LifeExtension.com](http://LifeExtension.com)



GLUTEN FREE



**NON  
GMO**  
LE CERTIFIED

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.

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 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.



Item #02121 • 60 vegetarian capsules

1 bottle **\$19.50**

4 bottles \$17.50 each

Just one daily capsule of **Homocysteine Resist** provides:

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

<sup>o</sup>DEF (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](http://www.LifeExtension.com)

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





# Brain Protection from New Form of Vitamin B12

BY MICHAEL DOWNEY



People with **vitamin B12** deficiencies frequently suffer anemia, weakness, and fatigue.

But there are more dangerous effects.

Low **vitamin B12** levels have been associated with progressive **brain atrophy** (shrinkage).

One study found an astounding **517%** greater rate of **brain volume loss** in people with lower vitamin B12 than those with *higher* B12 levels.<sup>1,2</sup>

Even B12 levels in the “low normal” range are associated with **cognitive impairment**.<sup>3</sup>

Many people already take **methylcobalamin**, one of two **bioactive** forms of vitamin B12, in their multivitamin.

But the *other* active B12 form—**adenosylcobalamin**—has unique properties that methylcobalamin does not.

New *in-vitro* research shows that **adenosylcobalamin** can **protect neurons** and prevent a decline in levels of the critical neurotransmitter, **dopamine**.<sup>4</sup>

A combination of both active forms of **vitamin B12** offers protection for aging brain cells.

## Activated Forms of Vitamin B12

**Vitamin B12** is essential for nerve function, cell metabolism, the formation of red blood cells, and DNA health.<sup>5-7</sup>

Vitamin B12 is found in animal sources, including meat, fish, poultry, eggs, and dairy products. Because of this, **vegans** and some **vegetarians** are at higher than average risk of developing vitamin B12 deficiency.<sup>8</sup>

B12 becomes more difficult to absorb as we age. This is one reason **older people** often have *lower* levels in the body.<sup>9,10</sup>

Vitamin B12 exists in various forms called cobalamins. The two active forms of cobalamins used by enzymes in the body are:<sup>11</sup>

- **Methylcobalamin**, which is active in the **cytosol** (liquid) inside the body's cells, and
- **Adenosylcobalamin**, which is active in the **mitochondria**, the fuel plants within each cell.



**Adenosylcobalamin** is the most prevalent form of vitamin B12 in human tissues, making up as much as **70%** of all forms of this vitamin in the body.<sup>11</sup> But it is missing from most B12 formulas and multivitamins.

## The B12 Link to Neurodegeneration

Up to **one million** Americans suffer from **Parkinson's disease**, a degenerative disease of the central nervous system. Roughly **60,000** new cases are diagnosed **each year**. The risk increases after age 50, but about **4%** of patients are diagnosed before then.<sup>12,13</sup>

Common symptoms include tremors, muscle rigidity, slowness and difficulty with movement, poor balance, sleep disturbances, loss of coordination, cognitive decline, and—in very advanced cases—dementia.

**Mitochondrial dysfunction** has been identified as a central feature of Parkinson's disease.<sup>14-16</sup>

Since the **adenosylcobalamin** form of **vitamin B12** supports **mitochondrial** function, scientists reasoned that it might help treat Parkinson's.

They made some remarkable discoveries.

## Inhibiting Neurodegeneration

To investigate the therapeutic potential of **adenosylcobalamin**, scientists performed a series of experiments in *in-vitro* models, worms, and mice.

They administered this unique form of B12 to the larvae of worms that carried a mutation linked to **Parkinson's disease**.<sup>4</sup>

Worms with this mutation suffer from **abnormal movement control**. But mutated worms that had been treated with adenosylcobalamin as larvae were able to move **normally** as adults.<sup>4</sup>

Worms with the Parkinson's mutation experience accelerated degeneration of their **dopamine-producing neurons**.

As a result of this neurodegeneration, less than **60%** of these nervous system cells remained in *untreated mutated* worms after nine days of life. But in mutated worms that had been treated with **adenosylcobalamin**, close to **75%** of these neurons survived after the same period.<sup>4</sup>

This near **75% neuron survival rate** matched the percentage of neurons that survived in worms without the Parkinson's mutation.





### Preventing Decreases in Dopamine

Scientists next studied the specific effect of **adenosylcobalamin** treatment on **dopamine** levels in mice with this mutation.

For this experiment, scientist prepared brain slices of these mice and treated them with adenosylcobalamin.

Then, every two minutes for 20 minutes, they stimulated the dopamine-producing neurons.<sup>4</sup>

At the end of the 20-minute period, the stimulated neurons of the *control* slices were releasing **20% less dopamine**.

But the brain slices treated with **adenosylcobalamin** exhibited *sustained dopamine* levels, showing dopamine output **equal** to that of animals without the mutation.<sup>4</sup>

Taken together, these findings suggest that adenosylcobalamin could prevent dopamine loss, brain cell depletion, and neurotoxicity.

### WHAT YOU NEED TO KNOW

## Active Forms of Vitamin B12 Protect the Brain

- **Vitamin B12** is critical for nerve function, cell metabolism, the formation of red blood cells, DNA production, and more.
- Aging, and vegan or vegetarian people often suffer from vitamin B12 **deficiency**. Oral supplementation can correct this.
- There are two active forms of vitamin B12—**adenosylcobalamin** and **methylcobalamin**. *The body needs both* forms.
- The better-known form of the two, **methylcobalamin**, is used to reduce stress, lower dangerously elevated levels of homocysteine, and treat conditions including nerve damage.
- Animal data now show that **adenosylcobalamin** uniquely protects brain neurons, prevents a decline in **dopamine** levels, and may block neurodegeneration.
- Initial findings suggest that adenosylcobalamin inhibits overactivity of an enzyme linked with **Parkinson's disease**.
- Daily oral intake of **500 mcg** of **adenosylcobalamin** and **500 mcg** of **methylcobalamin** is a great choice for whole-body health *and* potential defense against neurodegeneration.



## Importance of Methylcobalamin

Adenosylcobalamin shouldn't *replace* **methylcobalamin** in a supplementation program. Instead, they should be used together for maximum benefit.

**Methylcobalamin** is a form of vitamin B12 that is active in the **central nervous system**, and it is essential to the growth and replication of cells.<sup>5-7</sup>

Protecting brain cells against **neurodegeneration** is critical for aging individuals seeking to maintain their cognitive function.

Several studies have connected **homocysteine** to negative effects on the brain and brain vasculature.<sup>17,18</sup> Elevated homocysteine has been associated with as much as a **10.5-fold** greater risk of **vascular dementia**, and to brain shrinkage.<sup>1,19-21</sup>

Homocysteine has been tied to destructive effects that can accompany aging. These include chronic inflammation, atherosclerotic plaque, shrinkage of brain areas (e.g., hippocampus) involved in memory formation, development of beta-amyloid plaque, and hindrance of the DNA repair needed for brain cell maintenance.<sup>21-28</sup>

Methylcobalamin *lowers* homocysteine, which helps protect against these effects.<sup>29,30</sup>

This new pre-clinical evidence suggests that *adding* **adenosylcobalamin**, the other active form of vitamin B12, may provide additional protection for brain cells and help prevent a decline in dopamine levels.

Daily oral dosages of **500 mcg** of **adenosylcobalamin** and **500 mcg** of **methylcobalamin** can help provide broad protection of both body and brain.

## Summary

There are two bioactive forms of vitamin B12, **adenosylcobalamin** and **methylcobalamin**. Your body needs both to function youthfully and optimally. Together, these are the best forms of vitamin B12.

Many people already take the **methylcobalamin** form of B12 based on data showing it is essential for proper DNA synthesis, red blood cell formation, cell growth, and more.

But the **adenosylcobalamin** form is active in the **mitochondria**, the powerhouses of the cells.

A preclinical study has shown it has the ability to protect brain neurons and to prevent a decline of the neurotransmitter **dopamine** in animal models.

Vegans, vegetarians, and the aging often develop vitamin B12 deficiencies. Oral intake of *both* active forms of vitamin B12 can support brain and body health. •

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

## References

1. Grober U, Kisters K, Schmidt J. Neuroenhancement with vitamin B12-underestimated neurological significance. *Nutrients*. 2013 Dec 12;5(12):5031-45.
2. Vogiatzoglou A, Refsum H, Johnston C, et al. Vitamin B12 status and rate of brain volume loss in community-dwelling elderly. *Neurology*. 2008 Sep 9;71(11):826-32.
3. Kobe T, Witte AV, Schnelle A, et al. Vitamin B-12 concentration, memory performance, and hippocampal structure in patients with mild cognitive impairment. *Am J Clin Nutr*. 2016 Apr;103(4):1045-54.
4. Schaffner A, Li X, Gomez-Llorente Y, et al. Vitamin B12 modulates Parkinson's disease LRRK2 kinase activity through allosteric regulation and confers neuroprotection. *Cell Res*. 2019 Apr;29(4):313-29.
5. O'Leary F, Samman S. Vitamin B12 in health and disease. *Nutrients*. 2010 Mar;2(3):299-316.
6. Nohr D, Biesalski HK. Vitamin B12. *Reference Module in Food Science*: Elsevier; 2016.
7. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK114302/>. Accessed February 10, 2021.
8. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK441923/>. Accessed February 10, 2021.
9. Allen LH. How common is vitamin B-12 deficiency? *Am J Clin Nutr*. 2009 Feb;89(2):693S-6S.

## Many People—Especially the Elderly—Are Deficient in Vitamin B12

Many people are deficient in **vitamin B12**, and other B vitamins, for multiple reasons.

For instance, some circumstances either boost the body's demand for B vitamins or greatly inhibit vitamin B absorption, making supplementation necessary.

Individuals in the following categories have the greatest risk of a vitamin B12 deficiency. For these individuals, the need for a daily supplement can be much more critical.

### ELDERLY

Many older adults experience a decline in their appetite, reducing their overall dietary intake of *all* B vitamins. Older individuals may also be unable to *absorb* naturally occurring vitamin B12. With age, many people develop a loss of certain important functions of the stomach and digestive tract. This includes a *decreased* production of stomach acid, an intrinsic factor needed to release B12 from foods, and for its absorption in the small intestine.<sup>31,32</sup>



### CERTAIN MEDICATIONS

Commonly prescribed drugs that reduce stomach acid production (**proton pump inhibitors**) decrease absorption of vitamin B12.<sup>33</sup> Metformin, the popular diabetes drug, is known to interfere with the absorption of vitamin B12.<sup>34,35</sup> Birth control pills can also deplete B12 and other B vitamins.<sup>36</sup>

### PREGNANCY

B vitamins, especially B12, are important for healthy fetal development. In breast-feeding or pregnant women, a deficiency of B12 can result in severe neurological damage or birth defects in the infant or fetus.<sup>37,38</sup>

### SOME MEDICAL CONDITIONS

People suffering from alcoholism, hypothyroidism, anorexia, celiac disease, or Crohn's disease have a much greater risk of developing a deficiency in vitamin B12 and other B vitamins.<sup>39-43</sup> Weight-loss surgery also increases the risk of a deficiency in B vitamins.<sup>44</sup>

### VEGETARIANS AND VEGANS

Because they avoid meat and animal products, vegans and strict vegetarians may be at risk of a vitamin B12 deficiency.<sup>45</sup>

This deficiency can lead to digestive disturbances, anemia and blood disorders, and fatigue. It can also affect the peripheral nerves. In later stages, it may target the spinal cord.<sup>7,17,46</sup>

All this can lead to impaired mental function, often manifesting as slower thinking, attention deficits, and memory lapses.<sup>17</sup>

Any of these factors make daily oral intake of **vitamin B12**—including *both* **methylcobalamin** and **adenosylcobalamin**—an important component of a comprehensive wellness program.



10. Watanabe F. Vitamin B12 sources and bioavailability. *Exp Biol Med (Maywood)*. 2007 Nov;232(10):1266-74.
11. Authority EFS. 5'-deoxyadenosylcobalamin and methylcobalamin as sources for Vitamin B12 added as a nutritional substance in food supplements - Scientific opinion of the Scientific Panel on Food Additives and Nutrient Sources added to food. *EFSA Journal*. 2008;6(10):815.
12. Available at: <https://www.parkinson.org/Understanding-Parkinsons/Statistics>. Accessed February 10, 2021.
13. Heisters D. Parkinson's: symptoms, treatments and research. *Br J Nurs*. 2011 May 13-26;20(9):548-54.
14. Park JS, Davis RL, Sue CM. Mitochondrial Dysfunction in Parkinson's Disease: New Mechanistic Insights and Therapeutic Perspectives. *Curr Neurol Neurosci Rep*. 2018 Apr 3;18(5):21.
15. Chen C, Turnbull DM, Reeve AK. Mitochondrial Dysfunction in Parkinson's Disease-Cause or Consequence? *Biology (Basel)*. 2019 May 11;8(2):38.
16. Winkhofer KF, Haass C. Mitochondrial dysfunction in Parkinson's disease. *Biochim Biophys Acta*. 2010 Jan;1802(1):29-44.
17. Briani C, Dalla Torre C, Citton V, et al. Cobalamin deficiency: clinical picture and radiological findings. *Nutrients*. 2013 Nov 15;5(11):4521-39.
18. Soni RM, Tiwari SC, Mahdi AA, et al. Serum Homocysteine and Behavioral and Psychological Symptoms of Dementia: Is There Any Correlation in Alzheimer's Disease? *Ann Neurosci*. 2019 Jan;25(3):152-9.
19. Tan C, Peng W, Deng Y. [Risk factors and predictive factors of cognitive deterioration in patients of vascular cognitive impairment no dementia with subcortical ischemic vascular disease]. *Zhonghua Yi Xue Za Zhi*. 2014 Feb 11;94(5):352-5.
20. Cervellati C, Romani A, Seripa D, et al. Oxidative balance, homocysteine, and uric acid levels in older patients with Late Onset Alzheimer's Disease or Vascular Dementia. *J Neurol Sci*. 2014 Feb 15;337(1-2):156-61.
21. Tan B, Venketasubramanian N, Vrooman H, et al. Homocysteine and Cerebral Atrophy: The Epidemiology of Dementia in Singapore Study. *J Alzheimers Dis*. 2018;62(2):877-85.
22. Papatheodorou L, Weiss N. Vascular oxidant stress and inflammation in hyperhomocysteinemia. *Antioxid Redox Signal*. 2007 Nov;9(11):1941-58.
23. Weiss N, Keller C, Hoffmann U, et al. Endothelial dysfunction and atherothrombosis in mild hyperhomocysteinemia. *Vasc Med*. 2002 Aug;7(3):227-39.
24. Kruman, II, Kumaravel TS, Lohani A, et al. Folic acid deficiency and homocysteine impair DNA repair in hippocampal neurons and sensitize them to amyloid toxicity in experimental models of Alzheimer's disease. *J Neurosci*. 2002 Mar 1;22(5):1752-62.
25. Li JG, Chu J, Barrero C, et al. Homocysteine exacerbates beta-amyloid pathology, tau pathology, and cognitive deficit in a mouse model of Alzheimer disease with plaques and tangles. *Ann Neurol*. 2014 Jun;75(6):851-63.
26. Smith AD, Smith SM, de Jager CA, et al. Homocysteine-lowering by B vitamins slows the rate of accelerated brain atrophy in mild cognitive impairment: a randomized controlled trial. *PLoS One*. 2010 Sep 8;5(9):e12244.
27. Choe YM, Sohn BK, Choi HJ, et al. Association of homocysteine with hippocampal volume independent of cerebral amyloid and vascular burden. *Neurobiol Aging*. 2014 Jul;35(7):1519-25.
28. Guthikonda S, Haynes WG. Homocysteine: role and implications in atherosclerosis. *Curr Atheroscler Rep*. 2006 Mar;8(2):100-6.
29. Koyama K, Usami T, Takeuchi O, et al. Efficacy of methylcobalamin on lowering total homocysteine plasma concentrations in haemodialysis patients receiving high-dose folic acid supplementation. *Nephrol Dial Transplant*. 2002 May;17(5):916-22.
30. Yuan M, Wang B, Tan S. Methylcobalamin and early functional outcomes of ischemic stroke patients with H-type hypertension. *Rev Assoc Med Bras (1992)*. 2018 May;64(5):428-32.
31. Available at: <https://lpi.oregonstate.edu/mic/vitamins/vitamin-B12>. Accessed February 21, 2021.
32. Available at: <http://www.fao.org/3/Y2809E/y2809e0b.htm>. Accessed February 15, 2021.
33. Heidelbaugh JJ. Proton pump inhibitors and risk of vitamin and mineral deficiency: evidence and clinical implications. *Ther Adv Drug Saf*. 2013 Jun;4(3):125-33.
34. Mazokopakis EE, Starakis IK. Recommendations for diagnosis and management of metformin-induced vitamin B12 (Cbl) deficiency. *Diabetes Res Clin Pract*. 2012 Sep;97(3):359-67.
35. de Jager J, Kooy A, Leher P, et al. Long term treatment with metformin in patients with type 2 diabetes and risk of vitamin B-12 deficiency: randomised placebo controlled trial. *BMJ*. 2010 May 20;340:c2181.
36. Palmery M, Saraceno A, Vaiarelli A, et al. Oral contraceptives and changes in nutritional requirements. *Eur Rev Med Pharmacol Sci*. 2013 Jul;17(13):1804-13.
37. Pepper MR, Black MM. B12 in fetal development. *Semin Cell Dev Biol*. 2011 Aug;22(6):619-23.
38. Kominiarek MA, Rajan P. Nutrition Recommendations in Pregnancy and Lactation. *Med Clin North Am*. 2016 Nov;100(6):1199-215.
39. Brinkman DJ, Bekema JK, Kuijkenhoven MA, et al. [Thiamine in patients with alcohol use disorder and Wernicke's encephalopathy]. *Ned Tijdschr Geneesk*. 2017;161:D931.
40. Jabbar A, Yawar A, Waseem S, et al. Vitamin B12 deficiency common in primary hypothyroidism. *J Pak Med Assoc*. 2008 May;58(5):258-61.
41. Achamrah N, Coeffier M, Rimbart A, et al. Micronutrient Status in 153 Patients with Anorexia Nervosa. *Nutrients*. 2017 Mar 2;9(3).
42. Wierdsma NJ, van Bokhorst-de van der Schueren MA, Berkenpas M, et al. Vitamin and mineral deficiencies are highly prevalent in newly diagnosed celiac disease patients. *Nutrients*. 2013 Sep 30;5(10):3975-92.
43. Huang S, Ma J, Zhu M, et al. Status of serum vitamin B12 and folate in patients with inflammatory bowel disease in China. *Intest Res*. 2017 Jan;15(1):103-8.
44. John S, Hoegerl C. Nutritional deficiencies after gastric bypass surgery. *J Am Osteopath Assoc*. 2009 Nov;109(11):601-4.
45. Rizzo G, Lagana AS, Rapisarda AM, et al. Vitamin B12 among Vegetarians: Status, Assessment and Supplementation. *Nutrients*. 2016 Nov 29;8(12).
46. Savage DG, Lindenbaum J. Neurological complications of acquired cobalamin deficiency: clinical aspects. *Baillieres Clin Haematol*. 1995 Sep;8(3):657-78.



# VEGAN Vitamin D3

The Vegan  
Option for the  
Sunshine Vitamin

**Vegan** diets are often  
low in **vitamin D**.

The new **Vegan Vitamin D3**  
fills the gap with **125 mcg**  
**(5,000 IU)** of **vitamin D3** in  
each plant-based capsule.

This completely **vegan**  
formula provides all-natural  
**vitamin D3** from **algae**.

For full product description and to order **Vegan Vitamin D3**,  
call **1-800-544-4440** or visit **www.LifeExtension.com**



## Vegan Vitamin D3

Item #02422 • 60 vegan capsules  
1 bottle **\$16.50** • 4 bottles **\$14.50** each





# Sweet DREAMS

Healthy sleep is one of the best ways to feel revitalized and maintain optimal health.

While many people find melatonin helps improve sleep, others take it nightly for its immune protection effects.

Take 30-60 minutes before going to sleep.



**Melatonin 10 mg**

60 vegetarian capsules

Item #00331

1 bottle \$21 • 4 bottles \$18



For full product description and to order premium-grade **Melatonin 10 mg**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



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.
- Reduces glutamate-induced toxicity.

Dissolve in the mouth or chew one vegetarian lozenge daily.



Item #02419 • 60 vegetarian lozenges

1 bottle \$8.25

4 bottles \$7.50 each



For full product description and  
to order **B12 Elite**,  
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.

# Restore Connections Between Your Neurons



Neuro-Mag® Magnesium L-Threonate was specifically formulated by MIT scientists to be uniquely absorbable by brain and nerve cells.

The numbers of synapses that connect brain cells decline with aging.

Magnesium L-Threonate has been shown to improve synaptic density and other structural components of the brain.\*



Item #01603 • 90 vegetarian capsules  
1 bottle \$30 • 4 bottles \$27 each



Item #02032 • 93.35 grams of powder  
1 jar \$28.50 • 4 jars \$26 each

For full product description and to order **Neuro-Mag® Magnesium L-Threonate** or **Neuro-Mag® Magnesium L-Threonate Powder**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**Reference:** \* *Gerontology*. 1996;42(3):170-80.

Magtein® is a registered trademark of Magceutics, Inc. and is distributed exclusively by AIDP, Inc.  
Magtein® is protected under U.S. patents 8,178,118; 8,142,803; 8,163,301 and other patents pending.

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



Higher Potency at  
Discount Pricing

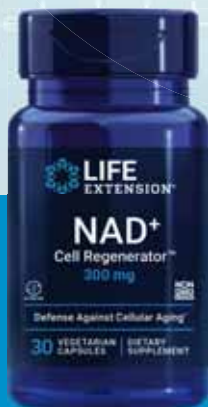
# NAD<sup>+</sup> Cell Regenerator

## TURN ON YOUR CELLULAR ENERGY

**Optimized NAD<sup>+</sup> Cell Regenerator™**  
combines **300 mg of nicotinamide  
riboside** with **resveratrol** and other  
**plant extracts**.

For those already taking resveratrol, we  
also offer **NAD<sup>+</sup> Cell Regenerator™**  
that provides **300 mg of nicotinamide  
riboside**.

The only **online** source of these **NAD<sup>+</sup>**  
formulas is **LifeExtension.com** (or by  
calling 1-800-544-4440).



**NAD<sup>+</sup> Cell Regenerator™**  
Item #02344 • 30 vegetarian capsules  
1 bottle \*

**NAD<sup>+</sup> Cell Regenerator™  
and Resveratrol**  
Item #02348 • 30 vegetarian capsules  
1 bottle \*



\* For pricing available to readers of this magazine, call 1-800-544-4440 or visit [LifeExtension.com/NAD](http://LifeExtension.com/NAD)

For full product description and to order **NAD<sup>+</sup> Cell Regenerator™**  
or **NAD<sup>+</sup> Cell Regenerator™ and Resveratrol**,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

NIAGEN® is a registered trademark of ChromaDex, Inc., Patents see: [www.ChromaDexPatents.com](http://www.ChromaDexPatents.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.



A close-up photograph of a man with a dark beard and hair, sleeping peacefully in a bed. He is wearing a white t-shirt and is covered by white bedding. The background is softly blurred, showing more of the bed and a hint of a room.

# Circumventing the Challenge of Middle-of-the-Night URINATION

BY MICHAEL DOWNEY



Waking up one or more times during the night to urinate is considered a normal part of life for older men.

It doesn't have to be.

Known as **nocturia**, it's more than just an annoyance.

It's associated with low-quality sleep, falls, heart disease, diabetes, and depression.<sup>1</sup>

Nocturia affects over **40 million** American men,<sup>2</sup> and most assume there's nothing they can do about it.

But scientists have identified *five* compounds that have demonstrated beneficial effects on nocturia and male **lower urinary tract** issues.<sup>3-8</sup>

In a **2020** clinical study by **Life Extension®**, the number of men suffering from **nocturia** was reduced by **64%**. And not a single participant was left waking up more than one time at night.<sup>9</sup>

This 2020 published study provides fresh scientific support for nutrients that support urinary health in aging men.





## Common Male Urinary Symptoms

With age, men are prone to a spectrum of **lower urinary tract symptoms** related to the bladder, urethra, and prostate gland.

By age 80, as many as **70%** of men are affected.<sup>10</sup>

One of the causes is **enlargement of the prostate gland**, which is common in older age.<sup>11</sup> Other contributing factors include damage to the urethra, obesity, diabetes, high blood pressure, smoking, some medications, and nervous system disorders.<sup>12</sup>

Lower **urinary tract** symptoms can include increased urinary frequency, urgency, incontinence, incomplete bladder emptying, hesitancy, prolonged urination, dribbling, and weak urine stream.<sup>13</sup>

One of the most common symptoms is **nocturia**, the need to get up to urinate during the night, often more than once.<sup>2,14</sup>

## Health Risks of Nocturia

Nocturia affects at least **half** of all men over age 50.<sup>15</sup> Clinically relevant **nocturia**, the need to urinate *twice or more* nightly, increases significantly with age, affecting up to **62%** of those aged 70-80.<sup>14</sup>

It can lead to serious health problems. A **quarter** of all falls by older individuals happen during the night, and a **quarter** of these are *directly related* to nocturia.<sup>1</sup>

In addition, over **40%** of people who have a night-time awakening have trouble going back to sleep.<sup>1</sup> Nightly sleep disturbances caused by **nocturia** are associated with:<sup>1,2,14,16,17</sup>

- Heart disease,
- Diabetes,
- Obesity,
- Poor physical health,
- Cognitive dysfunction,
- Depression,
- Mood changes,
- Fatigue and exhaustion,
- Reduced quality of life,
- Impaired productivity, and
- Increased **overall mortality**.

## Compounds that Target Nocturia

Medications often are meant to control bladder over-activity and urine-flow obstruction. This helps relieve the *daytime* urinary symptoms but may have little impact on nocturia.<sup>18</sup>



Some men are prescribed **alpha-blockers**, which can cause dizziness as a side effect, making them risky for elderly people.<sup>1,19</sup>

With the rapidly aging population, researchers have been searching for nutrients that can decrease or prevent nocturia.

They identified five compounds with urinary-health benefits:<sup>9</sup>

- Beta-sitosterol,
- Pygeum bark extract,
- Lycopene,
- Boron, and
- Melatonin.

### Beta-Sitosterol Helps Relieve Urinary Tract Symptoms

**Beta-sitosterol** is a plant compound isolated from the oils of certain vegetables and nuts.

Preclinical evidence indicates that beta-sitosterol possesses a broad range of **anti-inflammatory** properties.<sup>20-23</sup>

In an animal model, beta-sitosterol inhibits **5-alpha-reductase**, an enzyme in the prostate gland that converts testosterone to a more powerful growth-promoting hormone, **dihydro-testosterone**.<sup>24</sup>

In clinical studies of men with **prostate enlargement**, **beta-sitosterol** improves urinary symptoms. A randomized, double-blind, placebo-controlled study found that beta-sitosterol reduced urinary symptom severity by **50%** and improved quality-of-life scores by **42%**.<sup>3</sup>

### Pygeum Bark Helps Reduce Nighttime Urination

The bark of the African cherry tree, or **Pygeum africanum**, has been used for centuries in Africa to improve urinary symptoms and bladder discomfort.

In France, **Pygeum extract** has been given to patients suffering from **benign prostatic hypertrophy (BPH)**, enlargement of the prostate, since the 1970s.<sup>25</sup> It is still used today for the treatment of BPH-related lower **urinary tract** symptoms.<sup>26</sup>

Published studies show that *Pygeum* bark extracts help control bladder overactivity and reduce prostate enlargement and **nocturia**.<sup>25,27,28</sup> One clinical trial found as much as a **32%** reduction in the frequency of urination at night.<sup>4</sup>



## WHAT YOU NEED TO KNOW

### Banish the Nighttime Need to Urinate

- Older men routinely suffer from an array of **lower urinary tract symptoms (LUTS)**. One of the most common is **nocturia**, the need to get up at night to urinate, often more than once.
- Nocturia is more than an inconvenience. It can cause sleep loss, and puts older men at increased risk for falls and fractures. It is also associated with heart disease, physical and mental decline, greater mortality, and more.
- In a clinical trial conducted by **Life Extension®**, over **60%** of the participants using the combination of **beta-sitosterol**, **pygeum bark extract**, **lycopene**, **boron**, and **melatonin** reported relief from nighttime urination symptoms.



## Lycopene Helps Prevent Prostate Enlargement

**Lycopene** is a carotenoid pigment found in tomatoes and some other red or pink fruits and vegetables. It's a well-known **anti-inflammatory** and reduces **oxidative stress**.<sup>29</sup>

Lycopene tends to naturally concentrate in the **prostate gland**, allowing it to deliver its anti-inflammatory effects where they can best help reduce nighttime urination.<sup>30</sup>

Lycopene also has **antiproliferative** properties, which help prevent the abnormal growth of cells and may inhibit prostate enlargement. In cell studies, lycopene was shown to *slow down* prostate cell division.<sup>31</sup>

Like beta-sitosterol, **lycopene** reduces the production of the hormone **dihydrotestosterone**, one of the key drivers of prostate enlargement.<sup>32-34</sup>

In a clinical trial on prostate cancer patients, lycopene-rich tomato products significantly *decreased* **PSA (prostate-specific antigen) levels**, which rise as a man's prostate enlarges (or develops malignant cells).<sup>6</sup>

## Boron Helps Protect the Urinary Tract

The mineral **boron** *reduces* several markers of inflammation, including **TNF- $\alpha$  (tumor necrosis factor-alpha)**, **IL-6 (interleukin 6)**, and **C-reactive protein**.<sup>35</sup>

Boron also modulates sex-hormone production and reduces the impact of growth factors, such as **IGF-1 (insulin-like growth factor 1)**, which may contribute to prostate enlargement and nocturia.<sup>35,36</sup>

Boron has additional protective effects in the **prostate**, specifically blocking growth factors necessary for tumor development.<sup>36</sup> In studies, human prostate tumors implanted in mice were smaller by **38%** after low-dose boron supplementation, while serum PSA levels fell **89%**.<sup>36</sup>

Men with the *highest* dietary boron intake have a **54% associated lower risk of prostate cancer** compared to those with the lowest intake.<sup>5</sup>

## Melatonin Helps Reduce Nighttime Waking

**Melatonin**, a hormone produced by the pineal gland, has been shown to have potent **anti-inflammatory** effects<sup>37</sup> and may also reduce oxidative stress and blood pressure.<sup>38-40</sup>

Melatonin is best known for regulating **sleep-wake cycles**, and oral melatonin helps induce better sleep in some people.<sup>41-43</sup> While a need to urinate can cause



men to wake, men occasionally get up to urinate simply because they find their sleep already disrupted.<sup>44</sup>

A randomized, controlled trial published in the *Journal of Urology* evaluated melatonin's use in men suffering from **severe nocturia**, who wake on average *three times* a night to urinate. In these men, **2 mg** of melatonin before bed reduced the frequency of nocturia.<sup>7</sup>

Another human study found that men receiving **2 mg** of melatonin reduced their frequency of nighttime urination from an average of **3.4** times per night to **2.6** times per night.<sup>8</sup>

## Human Trial

A team of **Life Extension®** researchers conducted a 60-day pilot **human trial** to investigate whether these five compounds would work *together* to provide relief from nighttime urinary problems.<sup>9</sup>

The results of this study were published in **2020** in the journal *Global Advances in Health and Medicine*.

Researchers gave a blend of the compounds every night just before bedtime to 30 healthy men, aged 45 to 75 years, with mild **nocturia**.<sup>9</sup>

The formula contained:

- Beta-sitosterol (**180 mg**),
- Pygeum bark extract (**100 mg**),
- Lycopene (from **15 mg** of natural tomato fruit extract),
- Boron (**10 mg**), and
- Melatonin (**2 mg**).

Before treatment, **87%** of men reported *some degree* of nocturia. After 60 days of treatment, only **23%** still reported *some degree* of nocturia—a **64% reduction**.

Of the men who continued to report some nocturia after treatment, none reported more than a *single* awakening per night.

There was also a notable reduction in the **most severe** cases of nocturia.<sup>9</sup>

Before treatment, **37%** of the men woke *two to three times* nightly to urinate. After treatment, none of the men woke more than once a night.

This means that *all* of the men who had suffered the most **extreme nocturia**—and were at the greatest risk for sleep disruption, falls, and overall mortality<sup>2,14-17</sup>—experienced a reduction in symptoms.

This represents a potential advance for the **40 million** American men currently afflicted with this frustrating and potentially dangerous disorder.

## Summary

Many men suffer from **nocturia**, the need to get up one or more times nightly to urinate.

It can cause significant sleep loss and is linked to heart disease, obesity, diabetes, depression, cognitive dysfunction, and increased mortality.

Scientists have identified five compounds with demonstrated benefits for the male **lower urinary tract**:

- Beta-sitosterol,
- Pygeum bark extract,
- Lycopene,
- Boron, and
- Melatonin.

A clinical study showed that most men who took a blend of these compounds experienced an improvement in lower urinary tract symptoms and reduced frequency of nighttime urination. •

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

- Available at: <https://www.ncbi.nlm.nih.gov/books/NBK518987/>. Accessed February 22, 2021.
- Zumrutbas AE, Bozkurt AI, Alkis O, et al. The Prevalence of Nocturia and Nocturnal Polyuria: Can New Cutoff Values Be Suggested According to Age and Sex? *Int Neurol J*. 2016 Dec;20(4):304-10.
- Berges RR, Windeler J, Trampisch HJ, et al. Randomised, placebo-controlled, double-blind clinical trial of beta-sitosterol in patients with benign prostatic hyperplasia. Beta-sitosterol Study Group. *Lancet*. 1995 Jun 17;345(8964):1529-32.
- Breza J, Dzurny O, Borowka A, et al. Efficacy and acceptability of tadenan (Pygeum africanum extract) in the treatment of benign prostatic hyperplasia (BPH): a multicentre trial in central Europe. *Curr Med Res Opin*. 1998;14(3):127-39.
- Cui Y, Winton MI, Zhang ZF, et al. Dietary boron intake and prostate cancer risk. *Oncol Rep*. 2004 Apr;11(4):887-92.
- Paur I, Lilleby W, Bohn SK, et al. Tomato-based randomized controlled trial in prostate cancer patients: Effect on PSA. *Clin Nutr*. 2017 Jun;36(3):672-9.
- Drake MJ, Mills IW, Noble JG. Melatonin pharmacotherapy for nocturia in men with benign prostatic enlargement. *J Urol*. 2004 Mar;171(3):1199-202.
- Sugaya K, Nishijima S, Miyazato M, et al. Effects of melatonin and rilmafazone on nocturia in the elderly. *J Int Med Res*. 2007 Sep-Oct;35(5):685-91.
- Hirsh SP, Pons M, Joyal SV, et al. Self-Assessed Benefits of a Prostate Health Formulation on Nocturia in Healthy Males With Mild Lower Urinary Tract Symptoms: An Open Label Study. *Glob Adv Health Med*. 2020;9:2164956120973639.
- Parsons JK, Bergstrom J, Silberstein J, et al. Prevalence and characteristics of lower urinary tract symptoms in men aged > or = 80 years. *Urology*. 2008 Aug;72(2):318-21.
- Sarma AV, Wei JT. Clinical practice. Benign prostatic hyperplasia and lower urinary tract symptoms. *N Engl J Med*. 2012 Jul 19;367(3):248-57.
- Haidinger G, Temml C, Schatzl G, et al. Risk factors for lower urinary tract symptoms in elderly men. For the Prostate Study Group of the Austrian Society of Urology. *Eur Urol*. 2000 Apr;37(4):413-20.
- Lepor H. Pathophysiology of lower urinary tract symptoms in the aging male population. *Rev Urol*. 2005;7 Suppl 7(Suppl 7):S3-S11.
- Oelke M, De Wachter S, Drake MJ, et al. A practical approach to the management of nocturia. *Int J Clin Pract*. 2017 Nov;71(11).
- Miranda Ede P, Gomes CM, Torricelli FC, et al. Nocturia is the Lower Urinary Tract Symptom With Greatest Impact on Quality of Life of Men From a Community Setting. *Int Neurol J*. 2014 Jun;18(2):86-90.
- Everaert K, Anderson P, Wood R, et al. Nocturia is more bothersome than daytime LUTS: Results from an Observational, Real-life Practice Database including 8659 European and American LUTS patients. *Int J Clin Pract*. 2018 Jun;72(6):e13091.
- Shao IH, Wu CC, Hsu HS, et al. The effect of nocturia on sleep quality and daytime function in patients with lower urinary tract symptoms: a cross-sectional study. *Clin Interv Aging*. 2016;11:879-85.
- Andersson KE, Van Kerrebroeck P. Pharmacotherapy for Nocturia. *Curr Urol Rep*. 2018 Feb 9;19(1):8.
- Debruyne FMJ. Alpha blockers: are all created equal? *Urology*. 2000 2000/11/01;56(5):20-2.
- Loizou S, Lekakis I, Chrousos GP, et al. Beta-sitosterol exhibits anti-inflammatory activity in human aortic endothelial cells. *Mol Nutr Food Res*. 2010 Apr;54(4):551-8.
- Paniagua-Perez R, Flores-Mondragon G, Reyes-Legorreta C, et al. Evaluation of the Anti-Inflammatory Capacity of Beta-Sitosterol in Rodent Assays. *Afr J Tradit Complement Altern Med*. 2017;14(1):123-30.
- Sun Y, Gao L, Hou W, et al. beta-Sitosterol Alleviates Inflammatory Response via Inhibiting the Activation of ERK/p38 and NF-kappaB Pathways in LPS-Exposed BV2 Cells. *Biomed Res Int*. 2020;2020:7532306.
- Valerio M, Awad AB. beta-Sitosterol down-regulates some pro-inflammatory signal transduction pathways by increasing the activity of tyrosine phosphatase SHP-1 in J774A.1 murine macrophages. *Int Immunopharmacol*. 2011 Aug;11(8):1012-7.
- Cabeza M, Bratoeff E, Heuze I, et al. Effect of beta-sitosterol as inhibitor of 5 alpha-reductase in hamster prostate. *Proc West Pharmacol Soc*. 2003;46:153-5.
- Andro M-C, Riffaud J-P. Pygeum africanum extract for the treatment of patients with benign prostatic hyperplasia: A review of 25 years of published experience. *Current Therapeutic Research*. 1995 1995/08/01;56(8):796-817.
- Salinas-Casado J, Esteban-Fuertes M, Carballido-Rodriguez J, et al. Review of the experience and evidence of Pygeum africanum in urological practice. *Actas Urol Esp*. 2020 Jan - Feb;44(1):9-13.
- Ishani A, MacDonald R, Nelson D, et al. Pygeum africanum for the treatment of patients with benign prostatic hyperplasia: a systematic review and quantitative meta-analysis. *Am J Med*. 2000 Dec 1;109(8):654-64.
- Wilt T, Ishani A, Mac Donald R, et al. Pygeum africanum for benign prostatic hyperplasia. *Cochrane Database Syst Rev*. 2002 (1):CD001044.
- Mozos I, Stoian D, Caraba A, et al. Lycopene and Vascular Health. *Front Pharmacol*. 2018;9:521.
- Wertz K, Siler U, Goralczyk R. Lycopene: modes of action to promote prostate health. *Arch Biochem Biophys*. 2004 Oct 1;430(1):127-34.
- Schwarz S, Obermuller-Jevic UC, Hellmis E, et al. Lycopene inhibits disease progression in patients with benign prostate hyperplasia. *J Nutr*. 2008 Jan;138(1):49-53.
- Pagano E, Laudato M, Griffo M, et al. Phytotherapy of benign prostatic hyperplasia. A minireview. *Phytother Res*. 2014 Jul;28(7):949-55.
- Carson C, 3rd, Rittmaster R. The role of dihydrotestosterone in benign prostatic hyperplasia. *Urology*. 2003 Apr;61(4 Suppl 1):2-7.
- Wan L, Tan HL, Thomas-Ahner JM, et al. Dietary tomato and lycopene impact androgen signaling- and carcinogenesis-related gene expression during early TRAMP prostate carcinogenesis. *Cancer Prev Res (Phila)*. 2014 Dec;7(12):1228-39.
- Pizzorno L. Nothing Boring About Boron. *Integr Med (Encinitas)*. 2015 Aug;14(4):35-48.
- Gallardo-Williams MT, Chapin RE, King PE, et al. Boron supplementation inhibits the growth and local expression of IGF-1 in human prostate adenocarcinoma (LNCaP) tumors in nude mice. *Toxicol Pathol*. 2004 Jan-Feb;32(1):73-8.
- Cuzzocrea S, Costantino G, Mazzon E, et al. Regulation of prostaglandin production in carrageenan-induced pleurisy by melatonin. *J Pineal Res*. 1999 Aug;27(1):9-14.
- Zuo J, Jiang Z. Melatonin attenuates hypertension and oxidative stress in a rat model of L-NAME-induced gestational hypertension. *Vasc Med*. 2020 Aug;25(4):295-301.
- Ahsanova E, Popov V, Bulanov N, et al. Hypotensive Action of Melatonin in Patients with Arterial Hypertension. *Eur Cardiol*. 2020 Feb;15:e43.
- Tordjman S, Chokron S, Delorme R, et al. Melatonin: Pharmacology, Functions and Therapeutic Benefits. *Curr Neuropharmacol*. 2017 Apr;15(3):434-43.
- Srinivasan V, Spence DW, Pandi-Perumal SR, et al. Jet lag: therapeutic use of melatonin and possible application of melatonin analogs. *Travel Med Infect Dis*. 2008 Jan-Mar;6(1-2):17-28.
- Brzezinski A, Vangel MG, Wurtman RJ, et al. Effects of exogenous melatonin on sleep: a meta-analysis. *Sleep Med Rev*. 2005 Feb;9(1):41-50.
- Sletten TL, Magee M, Murray JM, et al. Efficacy of melatonin with behavioural sleep-wake scheduling for delayed sleep-wake phase disorder: A double-blind, randomised clinical trial. *PLoS Med*. 2018 Jun;15(6):e1002587.
- Available at: <https://my.clevelandclinic.org/health/diseases/14510-nocturia>. Accessed February 17, 2021.

*Super Health.  
Super Libido.  
Super Miraforte.*

# Top Off Your TESTOSTERONE

Maintaining healthy **testosterone** levels helps men regain health and improve performance.

By the time a man is 70 years old, he may produce **60% less** testosterone than he did at age 40.\*

The time is now to add **Super Miraforte with Standardized Lignans** to your supplement regimen.

## Low Testosterone Levels May Lead to:

- Reduced Sex Drive
- Less Energy
- Cloudy Thinking
- Weight Gain
- Cardiovascular Factors



Item #01940 • 120 vegetarian capsules

1 bottle **\$46.50**

4 bottles \$42 each

For full product description and to order **Super Miraforte with Standardized Lignans**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

\* J Clin Endocrinol Metab. 2002 Feb;87(2):589-98.

**Caution:** If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product. Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

Bioperine® is a registered trademark of Sabinsa Corp. HMRLignan™ is a trademark used under sublicense from Linnea S.A.



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 AUTHENTIC *Extra Virgin Olive Oil* YOU CAN TRUST

California Estate Organic Extra Virgin Olive Oil is American grown and lab-tested to be *extremely* high in polyphenols—over **800 mg per kg**—as well as organic, authentic, and unadulterated.

This unfiltered **extra virgin olive oil** is:

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

Item #02008 • 500 ml

1 bottle **\$24.75**

4 bottles \$22.50 each



For full product description and to order California Estate Organic Extra Virgin Olive Oil,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



# Draw A LINE IN THE SAND


## Promote a Healthy Urinary Pattern

Nature calls when it's ready, and it won't wait for you. It can even wake you from a deep sleep. Sound familiar? Then it's time to draw your line in the sand with **Men's Bladder Control**.

Our once-daily men's health supplement is packed with nutrients that are great for your prostate and bladder. And we've added melatonin to encourage a night of healthy, restful sleep.

Stop getting held back by a restless night. Get the uninterrupted rest you deserve with Men's Bladder Control formula from Life Extension®.

Our clinical research team even conducted a study to see its effectiveness. Healthy older men took one capsule every night before bed. The results?

 **60%**  
of the men  
in the study  
reported  
relief.\*

The number of participants who enjoyed a full night's sleep after the study grew a whopping six-fold.



Item #02306 • 30 vegetarian capsules

1 bottle \$20 • 4 bottles \$18 each

\* Submitted by BMC Complementary and Alternative Medicine 2019.

For full product description and to order **Men's Bladder Control**,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**CAUTION:** Do not consume alcohol, drive or operate machinery after taking this product.  
Lycored LycoBeads® is a registered trademark of Lycored, Orange, New Jersey.

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.



# BREATHE EASY



## N-ACETYL-L-CYSTEINE

Supports Healthy  
Respiratory Tract Function



**N-Acetyl-L-Cysteine (NAC)** supports healthy levels of *glutathione*, a molecule utilized by all cells for protection against free-radical damage and attacks from pathogens.

NAC is a powerful antioxidant that helps clear airways, and benefits bronchial, respiratory, liver, and immune health.

For full product description and to order **N-Acetyl-L-Cysteine**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item #01534  
600 mg, 60 capsules  
1 bottle \$10.50  
4 bottles \$9.25 each



GLUTEN FREE



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.

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

Two-Per-Day Offers You More Benefits Than Centrum®



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



Why settle for **subpar** supplements?

### Two-Per-Day Multivitamin Capsules

Item #02314 • 120 capsules (two-month supply)

**1 bottle \$18**

4 bottles \$16 each

### Two-Per-Day Multivitamin Tablets

Item #02315 • 120 tablets (two-month supply)

**1 bottle \$17.25**

4 bottles \$15.50 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.





# Fish Oil and Metabolic Syndrome

BY MARSHA MCCULLOCH, RD



**Metabolic syndrome** refers to a cluster of disorders including abdominal obesity, high blood pressure, low HDL cholesterol, high triglycerides and high blood sugar.<sup>1</sup>

In the United States, nearly **half** of people **age 60** and older have this cluster of metabolic disorders.<sup>2</sup>

Individuals with metabolic syndrome are at a higher risk of developing **type II diabetes** and **cardiovascular disease**.<sup>3</sup>

Metabolic syndrome also increases the risk of dementia, non-alcoholic fatty liver, and eye diseases like cataracts.<sup>4-7</sup>

Research shows that **fish oil** rich in omega-3 fatty acids (**EPA** and **DHA**) can help address the causes of **metabolic syndrome**.<sup>8,9</sup>

Americans' average dietary intake of **EPA** and **DHA** is low.<sup>10-12</sup>

Most **Life Extension**® readers supplement with about **2,000 mg** of **EPA + DHA** each day from highly purified **fish oil**.



## The Meaning of Metabolic Syndrome

**Metabolic syndrome** is defined as having at *least three* of the following five metabolic disorders:<sup>3</sup>

- Abdominal obesity (a waist circumference *more than 40 inches* in men or **35 inches** in women),
- High fasting blood glucose (**100 mg/dL** or above),
- High triglycerides (**150 mg/dL** or above),
- Low HDL (“good”) cholesterol (**40 mg/dL** or below in men or **50 mg/dL** or below in women), and
- High blood pressure (**130/85 mm Hg** or higher).



These metabolic abnormalities are closely linked with the underlying causes of **insulin resistance** and chronic, low-grade **inflammation**.<sup>7</sup>

**Fish oil** can help correct multiple elements of **metabolic syndrome**.

## Combating Metabolic Syndrome

Though a healthy diet, weight control, and regular exercise are vital for reducing the risk of metabolic syndrome, **fish oil** can also play a role.<sup>13</sup>

**Fish oil** contains a blend of fatty acids.<sup>11</sup>

The **omega-3** polyunsaturated fatty acids **EPA** (eicosapentaenoic acid) and **DHA** (docosahexaenoic acid) are the main components of fish oil.

Fish oil not only helps *prevent* metabolic syndrome—it can help **reverse** it.

When 39 overweight adults followed a healthy life-style program for five months, *only* the group that also took **fish oil** daily (providing **540 mg EPA** and **360 mg DHA**) had significantly reduced markers of **metabolic syndrome**.<sup>14</sup>

Fish oil helps prevent and reverse metabolic syndrome by addressing the individual components of the condition.

## Fighting Obesity and Inflammation

Fish oil can aid in reducing **obesity** in several ways.

One human trial showed that daily intake of **700 mg-1,620 mg** of **DHA** decreased body fat, including **belly fat**, in people with diabetes. A lower daily intake of **DHA (380 mg-500 mg)** wasn't as helpful.<sup>15</sup>

In this randomized, controlled trial, 68 people with type II diabetes took **DHA-rich fish oil** or a placebo for two months.<sup>15</sup>

The fish oil group *lost* **0.5-1 inch** from their waistline while the placebo group *gained* **0.5 inch**.<sup>15</sup>

Fish oil also decreases the **inflammation** associated with obesity.

Excess body fat increases the production of **inflammatory cytokines**, including interleukin 1 beta (IL-1 beta), interleukin 6 (IL-6), and tumor necrosis factor-alpha (TNF-alpha).<sup>8</sup>

EPA and DHA provide building blocks for **specialized pro-resolving mediators**, including resolvins, protectins, and maresins. These omega-3 metabolites play a vital role in *turning off* inflammatory responses and promoting tissue repair.<sup>16-19</sup>



### Targeting Insulin Resistance

Insulin resistance is closely associated with metabolic syndrome.

Recently, researchers reviewed the effects of fish oil on **diabetes** in a meta-analysis of 30 human trials.<sup>20</sup>

Twenty of the studies (**67%**) showed at least one diabetes-related benefit from fish oil. This included significant decreases in **fasting blood glucose** and **insulin resistance**, compared to placebo.

In a pilot study, researchers gave 32 overweight adults with type II diabetes fish oil (**1,440 mg EPA + 960 mg DHA**) daily for two months.<sup>8</sup>

The subjects experienced a significant *decrease* in **insulin resistance**, compared to the start of the study. In addition, study participants showed reductions in **pro-inflammatory cytokines**.

Similarly, when 36 obese adults took fish oil (**120 mg EPA + 860 mg DHA**) daily for three months, their **fasting insulin** level and **insulin resistance** each dropped by about **13%**. The placebo group had no improvement.<sup>21</sup>

### WHAT YOU NEED TO KNOW

## A Metabolic Syndrome Solution from the Sea

- **Metabolic syndrome** is a cluster of conditions including abdominal obesity, elevated fasting blood glucose, lipid abnormalities, and high blood pressure. Having metabolic syndrome increases risk for **type II diabetes** and **cardiovascular disease**.
- **EPA and DHA**, the main omega-3 fatty acids in **fish oil**, can significantly *decrease* the risk of metabolic syndrome and even help *reverse* the condition.
- One of the best-studied benefits of fish oil is lower **triglycerides**, which can reduce risk of heart disease.
- In **2019**, the **FDA** affirmed a new, qualified health claim for fish oil, noting that consumption of the omega-3 fatty acids EPA and DHA may *reduce* the risk of **high blood pressure** and **coronary heart disease**.
- Americans generally consume only a fraction of the omega-3s needed to reduce these risks. Daily oral intake of concentrated fish oil containing at least **2,000 mg EPA + DHA** can fill this gap.





## Omega-3 Reduces Cardiovascular Disease

One of the most widely recognized benefits of fish oil is lower **triglycerides**. This decreases risk of **cardiovascular disease**.<sup>22</sup>

A recent meta-analysis of 40 clinical trials showed that **omega-3** supplementation is associated with significant reductions in the risk for cardiovascular disease death.<sup>23</sup> Specifically, this study found that **EPA+DHA** supplementation is associated with a **reduced risk** of:

- Fatal myocardial infarction (**35%**)
- Myocardial infarction (**13%**)
- Coronary heart disease events (**10%**)
- Coronary heart disease mortality (**9%**)

The study, published in the ***Mayo Clinic Proceedings***, concluded that supplementation with **EPA and DHA** reduced the risk of coronary heart disease, including heart attack.<sup>23</sup>

Fish oil containing both EPA and DHA fatty acids has been shown to reduce the risk of cardiovascular disease by *lowering* **triglyceride** levels and *improving* **insulin sensitivity**.<sup>9,24,25</sup>

The cardiovascular protection was greater with *increases* in **omega-3 dosage**. Increasing intake of EPA and DHA by **1,000 mg** per day was associated with a **reduction** of **5.8%** in the risk of cardiovascular events.<sup>23</sup>

**Life Extension®** readers have been advised for decades to supplement with at least **2,000 mg** and higher of combined EPA and DHA to maximize health benefits plus ingest foods rich in omega-3s.

## Protecting the Heart

In **2019**, the FDA affirmed a new qualified health claim for fish oil, noting that consumption of the omega-3 fatty acids **EPA** and **DHA** may reduce the risk of **high blood pressure** and **coronary heart disease**.<sup>26</sup>

When blood pressure is elevated, the risks of **heart attack**, **stroke**, and **heart failure** sharply increase.<sup>27</sup>

Metabolic syndrome and insulin resistance compound the problem of high blood pressure in several ways:

- **High blood pressure** interacts synergistically with high blood glucose and harmful lipid levels, worsening atherosclerosis.<sup>27</sup>
- **Insulin resistance** limits the ability of blood vessels to dilate (widen) to promote healthy blood flow.<sup>28,29</sup>
- Higher circulating levels of unhealthy fatty acids due to insulin resistance leads to **blood vessel constriction** and an increase in blood pressure.<sup>13</sup>

Animal and human studies suggest that omega-3s may *inhibit* atherosclerosis and help lower blood pressure in several ways.<sup>30</sup>

Fish oil has **antioxidant**, **anti-inflammatory**, and **anti-clotting** actions in blood vessels. It also promotes blood vessel dilation.<sup>30,31</sup>

## Maximizing the Benefits of Fish Oil

Dosage is key for optimizing the benefits of fish oil.

An easy way to determine if omega-3 blood levels are optimal is to take a simple finger-stick test, done at home, called the **Omega-3 Index**.

The test reflects dietary intake of omega-3s.<sup>21</sup> An omega-3 index **above 8%** suggests a lower risk of cardiovascular disease.<sup>32</sup>

## Summary

Omega-3 fatty acids found in **fish oil** can improve several components of **metabolic syndrome**, as well as the underlying causes of **insulin resistance** and **chronic inflammation**.

**EPA** and **DHA** are the main active ingredients responsible for the benefits of fish oil and are available in concentrated form.

Consuming at least **2,000 mg** daily of **EPA + DHA** is usually needed to achieve the metabolic benefits of fish oil, including maintaining healthy triglycerides and blood pressure levels.

Preventing or reversing metabolic syndrome can reduce the risk of type II diabetes, cardiovascular disease, and other serious health conditions. •

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. Available at: <https://www.nhlbi.nih.gov/health/health-topics/topics/ms>. Accessed February 27, 2020.
2. Hirode G, Wong RJ. Trends in the Prevalence of Metabolic Syndrome in the United States, 2011-2016. *JAMA*. 2020 Jun 23;323(24):2526-8.
3. Available at: <https://www.uptodate.com/contents/metabolic-syndrome-insulin-resistance-syndrome-or-syndrome-x>. Accessed February 15, 2021.
4. Lima-Fontes M, Barata P, Falcao M, et al. Ocular findings in metabolic syndrome: a review. *Porto Biomed J*. 2020 Nov-Dec;5(6):e104.
5. Nilsson PM, Tuomilehto J, Ryden L. The metabolic syndrome - What is it and how should it be managed? *Eur J Prev Cardiol*. 2019 Dec;26(2\_suppl):33-46.
6. Nolan CJ, Prentki M. Insulin resistance and insulin hypersecretion in the metabolic syndrome and type 2 diabetes: Time for a conceptual framework shift. *Diab Vasc Dis Res*. 2019 Mar;16(2):118-27.
7. Aguilar-Salinas CA, Viveros-Ruiz T. Recent advances in managing/ understanding the metabolic syndrome. *F1000Res*. 2019;8.
8. Souza DR, Pieri B, Comim VH, et al. Fish oil reduces subclinical inflammation, insulin resistance, and atherogenic factors in overweight/obese type 2 diabetes mellitus patients: A pre-post pilot study. *J Diabetes Complications*. 2020 May;34(5):107553.
9. Gao H, Geng T, Huang T, et al. Fish oil supplementation and insulin sensitivity: a systematic review and meta-analysis. *Lipids Health Dis*. 2017 Jul 3;16(1):131.
10. Serhiyenko V. Omega-3 Polyunsaturated Fatty Acids, Metabolic Syndrome and Diabetes Mellitus. *Current Research in Diabetes & Obesity Journal*. 2018 02/06;5(4).

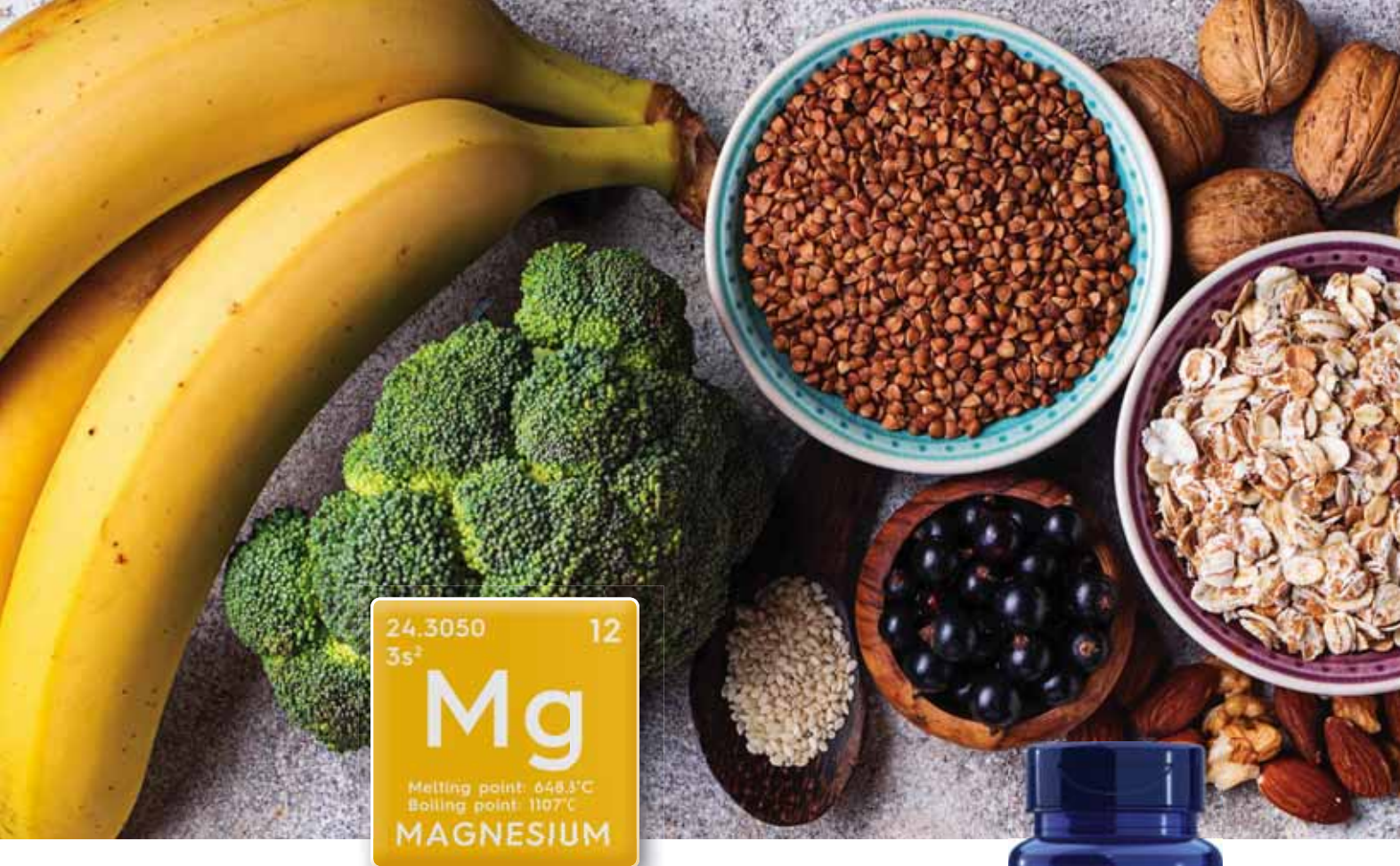




11. Srigley CT, Rader JL. Content and composition of fatty acids in marine oil omega-3 supplements. *J Agric Food Chem*. 2014 Jul 23;62(29):7268-78.
12. Papanikolaou Y, Brooks J, Reider C, et al. U.S. adults are not meeting recommended levels for fish and omega-3 fatty acid intake: results of an analysis using observational data from NHANES 2003-2008. *Nutr J*. 2014 Apr 2;13:31.
13. Rochlani Y, Pothineni NV, Kovelamudi S, et al. Metabolic syndrome: pathophysiology, management, and modulation by natural compounds. *Ther Adv Cardiovasc Dis*. 2017 Aug;11(8):215-25.
14. de Camargo Talon L, de Oliveira EP, Moreto F, et al. Omega-3 fatty acids supplementation decreases metabolic syndrome prevalence after lifestyle modification program. *Journal of Functional Foods*. 2015 02/01;19:922-8.
15. Mansoori A, Sotoudeh G, Djalali M, et al. Docosahexaenoic Acid-Rich Fish Oil Supplementation Improves Body Composition without Influence of the PPARgamma Pro12Ala Polymorphism in Patients with Type 2 Diabetes: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial. *J Nutrigenet Nutrigenomics*. 2015;8(4-6):195-204.
16. Doyle R, Sadlier DM, Godson C. Pro-resolving lipid mediators: Agents of anti-ageing? *Semin Immunol*. 2018 Dec;40:36-48.
17. Colussi G, Catena C, Fagotto V, et al. Atrial fibrillation and its complications in arterial hypertension: The potential preventive role of omega-3 polyunsaturated fatty acids. *Crit Rev Food Sci Nutr*. 2019 Jan 30;59(12):1937-48.
18. Polus A, Zapala B, Razny U, et al. Omega-3 fatty acid supplementation influences the whole blood transcriptome in women with obesity, associated with pro-resolving lipid mediator production. *Biochim Biophys Acta*. 2016 Nov;1861(11):1746-55.
19. Kwon Y. Immuno-Resolving Ability of Resolvins, Protectins, and Marins Derived from Omega-3 Fatty Acids in Metabolic Syndrome. *Mol Nutr Food Res*. 2020 Feb;64(4):e1900824.
20. Delpino FM, Figueiredo LM, da Silva BGC, et al. Omega-3 supplementation and diabetes: A systematic review and meta-analysis. *Crit Rev Food Sci Nutr*. 2021 Jan 22:1-14.
21. Abbott KA, Burrows TL, Acharya S, et al. DHA-enriched fish oil reduces insulin resistance in overweight and obese adults. *Prostaglandins Leukot Essent Fatty Acids*. 2020 Aug;159:102154.
22. Wolska A, Yang ZH, Remaley AT. Hypertriglyceridemia: new approaches in management and treatment. *Curr Opin Lipidol*. 2020 Dec;31(6):331-9.
23. Bernasconi AA, Wiest MM, Lavie CJ, et al. Effect of Omega-3 Dosage on Cardiovascular Outcomes: An Updated Meta-Analysis and Meta-Regression of Interventional Trials. *Mayo Clin Proc*. 2021 Feb;96(2):304-13.
24. Thota RN, Acharya SH, Garg ML. Curcumin and/or omega-3 polyunsaturated fatty acids supplementation reduces insulin resistance and blood lipids in individuals with high risk of type 2 diabetes: a randomised controlled trial. *Lipids Health Dis*. 2019 Jan 26;18(1):31.
25. Xyda SE, Vuckovic I, Petterson XM, et al. Distinct Influence of Omega-3 Fatty Acids on the Plasma Metabolome of Healthy Older Adults. *J Gerontol A Biol Sci Med Sci*. 2020 Apr 17;75(5):875-84.
26. Available at: <https://www.fda.gov/food/cfsan-constituent-updates/fda-announces-new-qualified-health-claims-epa-and-dha-omega-3-consumption-and-risk-hypertension-and>. Accessed February 22, 2021.
27. da Silva AA, do Carmo JM, Li X, et al. Role of Hyperinsulinemia and Insulin Resistance in Hypertension: Metabolic Syndrome Revisited. *Can J Cardiol*. 2020 May;36(5):671-82.
28. Zheng C, Liu Z. Vascular function, insulin action, and exercise: an intricate interplay. *Trends Endocrinol Metab*. 2015 Jun;26(6):297-304.
29. Jahn LA, Hartline L, Rao N, et al. Insulin Enhances Endothelial Function Throughout the Arterial Tree in Healthy But Not Metabolic Syndrome Subjects. *J Clin Endocrinol Metab*. 2016 Mar;101(3):1198-206.
30. Colussi G, Catena C, Novello M, et al. Impact of omega-3 polyunsaturated fatty acids on vascular function and blood pressure: Relevance for cardiovascular outcomes. *Nutr Metab Cardiovasc Dis*. 2017 Mar;27(3):191-200.
31. DiNicolantonio JJ, J OK. Importance of maintaining a low omega-6/omega-3 ratio for reducing platelet aggregation, coagulation and thrombosis. *Open Heart*. 2019;6(1):e001011.
32. Elagizi A, Lavie CJ, O'Keefe E, et al. An Update on Omega-3 Polyunsaturated Fatty Acids and Cardiovascular Health. *Nutrients*. 2021 Jan 12;13(1):204.







# EXTEND-RELEASE MAGNESIUM

## When You Need It

Unique delivery system provides immediate and extended-release magnesium for full-body coverage of this essential mineral.

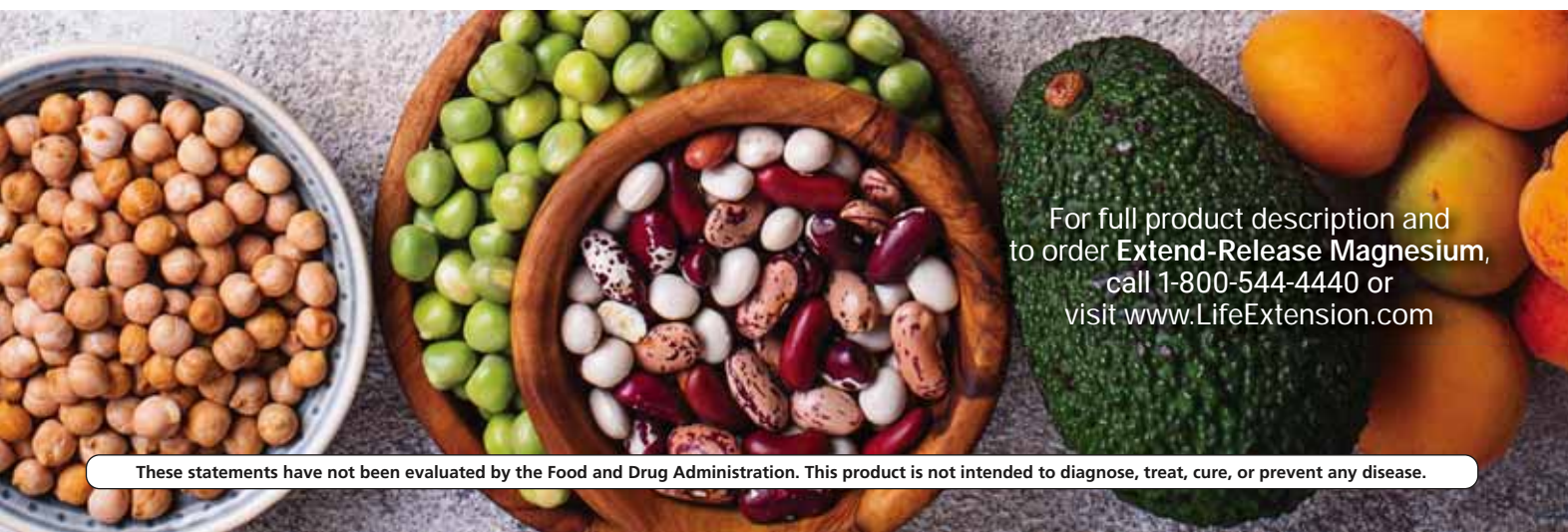
**CAUTION:** If taken in high doses, magnesium may have a laxative effect.  
If this occurs, divide dosing, reduce intake, or discontinue product.

ZümXR® is a registered trademark and protected by patents. See [www.ZümXR.com](http://www.ZümXR.com)



Item #02107 • 60 vegetarian capsules

1 bottle **\$9.75** • 4 bottles \$8.75 each



For full product description and to order **Extend-Release Magnesium**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



# SAMe

## FOR HEALTHY METHYLATION

Life Extension® first introduced SAMe in 1997. Since then, researchers around the world have continued to discover its impressive benefits.

While SAMe is largely known for mood support, it has also shown benefits for the liver and joints.

A study by Harvard Medical School and Massachusetts General Hospital cited the impressive benefits of SAMe for mood elevation.<sup>1</sup>

A report published in Germany showed that SAMe may help maintain healthy neurological function. This impressive report found that SAMe:<sup>2</sup>

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

In addition to these findings, SAMe also improves brain cell **methylation**, thereby facilitating youthful **DNA enzymatic actions**.

For full product description and to order **SAMe**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

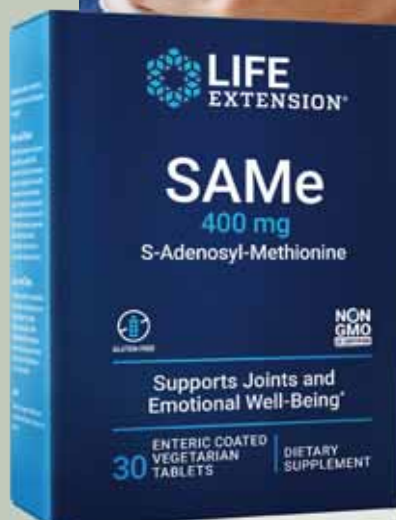
#### Item #02176

400 mg, 30 enteric coated vegetarian tablets

1 box **\$27** • 4 boxes \$24 each

#### References

1. *Am J Psychiatry*. 2010 Aug;167(8):942-8.
2. *Naunyn Schmiedeberg's Arch Pharmacol*. 2000 Jan;361(1):47-52.



(SAMe is also available in boxes containing 30 200 mg tablets. Price is \$18.75. If you buy four, the price is reduced to \$16.50 per box. Item #02175).

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

# HIGHLY PURIFIED Fish Oil

EPA/DHA FISH OIL +  
SESAME LIGNANS + OLIVE EXTRACT +  
KRILL + ASTAXANTHIN



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

Item #01988 • 120 softgels  
1 bottle \$33.75 • 4 bottles \$31.50 each

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

EPA/DHA FISH OIL +  
SESAME LIGNANS + OLIVE EXTRACT



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

Item #01982 • 120 softgels  
1 bottle \$24 • 4 bottles \$21 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](http://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 statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.







# Blood Tests to Better Predict Cardiovascular Risk

BY MICHAEL DOWNEY

**Blood tests** routinely ordered by mainstream doctors do not provide information needed to fully assess **cardiovascular risk**.

More detailed tests can pinpoint cardiac risks—and perhaps save your life.

This article describes **blood tests** to evaluate vascular health status before one develops symptoms of a **heart attack** or ischemic **stroke**.





## Doctors Fail to Test Critical Factors

Most **cardiovascular disease** is hidden until chest pain (angina) or a stroke manifest.

Standard **blood tests** for total **cholesterol**, low-density lipoprotein (**LDL**), and high-density lipoprotein (**HDL**) provide a partial picture of cardiovascular risk.

Missing from most cardiac tests is the number of **small LDL particles** circulating in your blood.

**Small LDL** cholesterol can be serious because the smaller particle size enables it to penetrate the arterial wall and start the process of **plaque formation**.

Small LDL is also more susceptible to oxidative damage.<sup>1</sup>

Knowing your **LDL particle count** provides crucial information beyond total cholesterol and LDL.

A blood test called the **NMR LipoProfile®** provides this information using nuclear magnetic resonance (NMR) spectroscopy to directly measure particle **size** and particle **count**.

## NMR LipoProfile®

The **NMR LipoProfile®** blood test measures:

- **LDL-P**—this is the **count** of LDL particles, and
- **Small LDL**—this is the **count** of *small* LDL particles.

If either of these is high, it is an indicator of an elevated risk of an **atherosclerotic** disease.

The **NMR LipoProfile®** determines the **size** of the **LDL** particles in your blood. Larger and more buoyant LDL particles do not pose the same risk as **small LDL**.

The **NMR LipoProfile®** test also provides a measure of **HDL-P**. This is the particle **count** for HDL, the “good” cholesterol. You want this number to be high.

Another test included in this panel is the **LP-IR** score, which you want to be **low**. This is a marker for **insulin resistance**—the *higher* the number, the greater the probability of developing diabetic-related disorders.

Knowing this may allow you to take corrective action before **type II diabetes** manifests and with it, the much greater risk of cardiovascular disease.

Some researchers have found that insulin resistance is associated with an increased risk for **cancer**.<sup>2,3</sup>

But how can you confidently interpret your numbers?

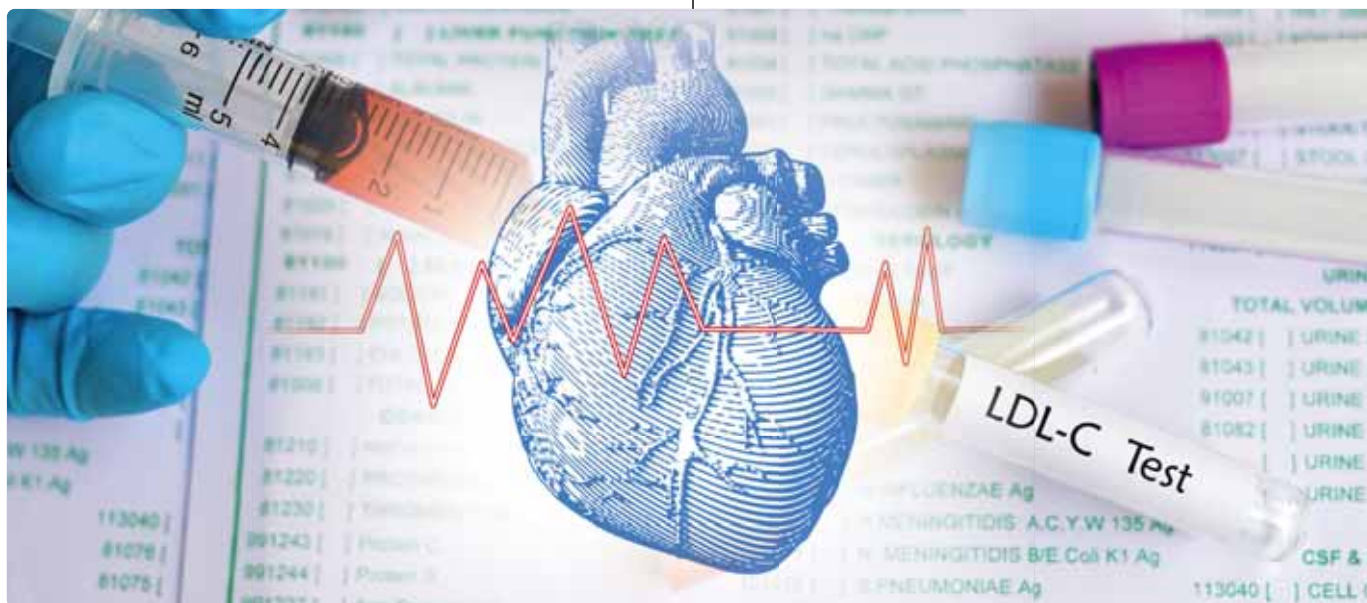
Included with the results of the **NMR LipoProfile®** test is a **chart** that helps identify your particular risks for coronary heart disease.

Results from an **NMR LipoProfile®** blood test arm you with a more comprehensive picture that you can discuss with your doctor.

## Oxidized LDL Test

**Oxidized LDL** cholesterol is more dangerous than non-oxidized cholesterol. **Small cholesterol** particles are notorious for oxidizing faster.

Oxidized LDL particles penetrate arterial walls (endothelium) and start a cascade of inflammatory events that lead to the formation and buildup of foam cells



and plaque. (Foam cells are immune cells engorged with fatty LDL.)

These structural changes account, in part, for atherosclerotic disease and risk of heart attack, stroke, and other cardiovascular disease.<sup>4</sup>

There are tests available that measure **oxidized LDL** and its related markers of **inflammation** to provide a better idea of what is happening inside your arteries.

### Assessing Vascular Inflammation

The **MPO blood test** is important for individuals who have a family history of cardiovascular disease or who make poor lifestyle choices.

When white blood cells attack the arterial wall, they release an enzyme called **myeloperoxidase** or **MPO**.

This process is dangerous when it occurs in response to **oxidized LDL** cholesterol. It creates **foam cells** that contribute to atherosclerotic plaque and narrowing of arteries.

MPO amplifies **inflammation** and causes problems that increase **arterial plaque**. Often, the plaque that MPO boosts is of the worst type—soft, vulnerable plaque that is prone to rupture.<sup>5,6</sup>

Making matters worse, MPO itself can also oxidize LDL cholesterol, further promoting plaque.<sup>7</sup> It can even oxidize HDL cholesterol—the “good” type of cholesterol—which renders HDL dysfunctional.

### C-Reactive Protein (CRP)

High sensitivity **C-reactive protein** (CRP) detects changes in inflammatory levels throughout the body.

**CRP** rises quickly after an inflammatory attack but should soon return to normal levels. When CRP remains high, however, it is an indication of **chronic inflammation**.

Elevated CRP levels indicate risk of heart attack, stroke, and death from cardiovascular disease – *even in apparently healthy people*.<sup>8</sup>

A study of over 50,000 individuals found that the *higher* the **CRP** levels, the greater the risk of cardiovascular disease and heart attack.<sup>9</sup>

And in addition to being a marker, CRP itself may **contribute** directly to cardiovascular and diabetes risk.<sup>8,10</sup> Elevated CRP levels have also been linked to **cancer** risk.<sup>11,12</sup>



### WHAT YOU NEED TO KNOW

## Blood Tests for Cardiovascular Health

- More detailed, more informative blood tests can pinpoint cardiac risk much better than the standard tests routinely ordered.
- Standard lipid tests give an incomplete picture, missing key cardiovascular disease markers.
- Stroke and heart disease remain the leading causes of disability and death. Most are preventable when risk factors, including hypertension are controlled.



## Apolipoprotein B

**Apolipoprotein B (ApoB)** is a primary protein constituent of all non-HDL cholesterol particles.

When apolipoprotein-B-containing particles penetrate the inner arterial wall (*endothelium*), they spark the initiation and progression of **atherosclerosis**, setting the stage for eventual blockage of blood flow.<sup>13-15</sup>

**Apolipoprotein B** proteins are now “**widely accepted as the most important causal agents of atherosclerotic cardiovascular disease.**”<sup>13</sup>

A study found that even when total cholesterol and HDL are within *healthy* ranges, high levels of **apolipoprotein B** can increase coronary heart disease risk by about **60%**.

When **total cholesterol** and **HDL** are in *unhealthy* ranges, high levels of **apolipoprotein B** can boost coronary heart disease risk by a frightening **160%**.<sup>16</sup>

A review of 27 studies found that lowering apolipoprotein levels resulted in a **reduction** in **existing** arterial plaque.<sup>17</sup>

The **apolipoprotein B** blood test is an often-overlooked indicator of cardiovascular risk.

## Other Heart-Disease-Related Blood Tests

Several other **blood tests** can help round out an evaluation of your risk for **cardiovascular disease**.

### Homocysteine

Elevated levels of homocysteine may directly damage the delicate cells that line the inside of your arteries (*endothelium*), resulting in vascular inflammation, blood clot formation, and greater risk of stroke.

### Vitamin D 25-Hydroxy

Low levels have now been found to be associated with increased risk for cardiovascular disease.<sup>18,19</sup>

More than **70%** of Americans have either deficient or insufficient blood levels of vitamin D.<sup>20</sup>

**Life Extension®** supporters have long been advised of the importance of maintaining an optimal vitamin D level between **50-80 ng/mL**.

### CBC/Chemistry Profile

This test includes a complete blood count (CBC) to indicate general and immune health. It also tests platelets for clotting status, as well as hemoglobin for oxygen-carrying capacity. The chemistry panel measures glucose, electrolytes, important liver enzymes, kidney markers, calcium, and uric acid levels.



## HbA1c

High blood levels of glucose are a major cause of long-term health issues, from cancer to **heart disease**. Practically all tissues in the body are negatively impacted by high blood sugar.

A **hemoglobin A1c** test is a superior way to screen for glucose problems because it shows what levels have looked like over the past *two to three months*. The higher the level, the more severe the problem with blood glucose control.

In addition, studies have shown that high levels of hemoglobin A1c are an important predictor of risk for heart disease, even in individuals who do not have metabolic syndrome or diabetes.<sup>21</sup>

## Omega-3 Index

In **June 2019**, the FDA affirmed a new, **qualified health claim** for fish oil, noting that consumption of the omega-3 fatty acids **EPA** and **DHA** may reduce the risk of high blood pressure and coronary heart disease.<sup>22</sup>

A simple, finger-stick test provides a wealth of information about **omega-3** and **omega-6** fatty acids' status in your blood.

One study found that those with an **omega-3 index** of **8%** or greater, compared to those with levels below **4%**, were estimated to have about a **30% lower risk of death** from coronary heart disease.<sup>23</sup>

## Interpreting Your Results

The Wellness Specialists at **Life Extension®** are available seven days a week to help you understand your blood test results at no charge. But as a quick rule, the very best results would be:

- *Low LDL-P* (low LDL particle count),
- *Low small LDL-P* (low small LDL particle count),
- *Large LDL size* (large and buoyant is the best kind of LDL),
- *Low LP-IR* (lower means better insulin sensitivity),
- *Low oxidized LDL* (oxidized LDL is more atherogenic),
- *Low MPO* (lower MPO indicates reduced vascular inflammation),
- *Low HbA1c* (high levels indicate elevated blood sugar and greater prediabetes or type II diabetes risk), and
- *Omega Index 8%-11%* (some data indicate 8% and above is ideal).

Results from these laboratory tests provide “reference ranges” that are helpful, but **Life Extension®** often recommends improvements beyond conventional guidelines to lower risk of cardiovascular diseases.

## Summary

Mainstream doctors seldom order a complete panel of technologically advanced blood tests to assess risk of cardiovascular disease events.

Levels of total cholesterol, LDL, and HDL do not paint the full picture of heart disease and stroke risk. While important, they are the tip of the iceberg of potentially important information.

Advanced, more detailed blood tests can better pinpoint risk of atherosclerosis, heart attack, and stroke. •

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



## What Cardiovascular-Risk Tests Do You Need?

The popular **Male or Female Panel Blood Panel** provides many tests described in this article including:

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| <b>Apolipoprotein B (ApoB)</b>               | <b>Homocysteine</b>                         |
| <b>Hemoglobin A1c</b>                        | <b>LDL cholesterol</b>                      |
| <b>Total cholesterol</b>                     | <b>HDL cholesterol</b>                      |
| <b>Triglycerides</b>                         | <b>25-hydroxyvitamin D</b>                  |
| <b>C-reactive protein (high sensitivity)</b> | <b>Complete Blood Count (CBC)/Chemistry</b> |

As you can see on page 15 of this month's issue, the **Male or Female Panels** provide far more tests than are typically prescribed in medical settings.

Those at higher risk for **coronary artery occlusion** or ischemic **stroke** should consider having the **NMR LipoProfile®** at least one time. If results come back in safe ranges, then this test may not be needed again for many years.

When first introduced, tests that measured **small LDL particles** and other lipid fractions in the **NMR LipoProfile®** cost over \$300. During the annual lab sale, you can obtain the **NMR LipoProfile®** for only \$74.25.

Similarly, once optimal balance of omega-3s to omega-6s and higher omega-3 index is established, the **Omega-3 Index** may only need to be done in response to outward changes indicative of **inflammation** or significant dietary alterations.

Those with preexisting atherosclerosis, or who are otherwise at high risk of cardiovascular events may consider adding **oxidized LDL** and/or **myeloperoxidase (MPO)**.

Note the **Blood Test Super Sale Price** for the **Male or Female Panel** is \$224, which is up to **90%** lower than what large commercial labs charge for these same tests.





## A Low-Cost, Easy Way to Have Blood Tests Done

The high cost of conventional blood testing discourages many people from availing themselves of this life-saving diagnostic, including today's more detailed, more useful tests.

**Life Extension®** long ago resolved this by allowing readers to order low-cost blood tests directly and then visit a drawing station in their own area at their convenience.

Detailed results typically come back in less than a week and are emailed to you. If you have any questions, our Wellness Specialists are available to assist, seven days a week at no charge.

Once a year, we discount prices of all lab tests. This is a convenient reminder to have your annual tests performed and save up to **25%** in the process.

## References

- Ivanova EA, Myasoedova VA, Melnichenko AA, et al. Small Dense Low-Density Lipoprotein as Biomarker for Atherosclerotic Diseases. *Oxid Med Cell Longev*. 2017;2017:1273042.
- Arcidiacono B, Iiritano S, Nocera A, et al. Insulin resistance and cancer risk: an overview of the pathogenetic mechanisms. *Exp Diabetes Res*. 2012;2012:789174.
- Scully T, Ettela A, LeRoith D, et al. Obesity, Type 2 Diabetes, and Cancer Risk. *Front Oncol*. 2020;10:615375.
- Leiva E, Wehinger S, Guzmán L, et al. Role of oxidized LDL in atherosclerosis. *Hypercholesterolemia*. 2015;55-78.
- Senders ML, Mulder WJM. Targeting myeloperoxidase in inflammatory atherosclerosis. *Eur Heart J*. 2018 Sep 14;39(35):3311-3.
- Kamanna VS, Ganji SH, Kashyap ML. Myeloperoxidase and Atherosclerosis. *Current Cardiovascular Risk Reports*. 2013 2013/04/01;7(2):102-7.
- Liguori I, Russo G, Curcio F, et al. Oxidative stress, aging, and diseases. *Clin Interv Aging*. 2018;13:757-72.
- Jimenez RV, Szalai AJ. Therapeutic Lowering of C-Reactive Protein. *Front Immunol*. 2020;11:619564.
- Wang A, Liu J, Li C, et al. Cumulative Exposure to High-Sensitivity C-Reactive Protein Predicts the Risk of Cardiovascular Disease. *J Am Heart Assoc*. 2017 Oct 24;6(10).
- Cheng L, Zhuang H, Yang S, et al. Exposing the Causal Effect of C-Reactive Protein on the Risk of Type 2 Diabetes Mellitus: A Mendelian Randomization Study. *Front Genet*. 2018;9:657.
- Li Y, Zhong X, Cheng G, et al. Hs-CRP and all-cause, cardiovascular, and cancer mortality risk: A meta-analysis. *Atherosclerosis*. 2017 Apr;259:75-82.
- Wang G, Li N, Cao L, et al. [Association between the level of high sensitivity C-reactive protein and risk of breast cancer among non-diabetic females: a prospective study in Kaifan group]. *Zhonghua Zhong Liu Za Zhi*. 2014 Dec;36(12):944-8.
- Shapiro MD, Fazio S. Apolipoprotein B-containing lipoproteins and atherosclerotic cardiovascular disease. *F1000Res*. 2017;6:134.
- Ohwada T, Sakamoto T, Kanno Y, et al. Apolipoprotein B correlates with intra-plaque necrotic core volume in stable coronary artery disease. *PLoS One*. 2019;14(2):e0212539.
- Boren J, Williams KJ. The central role of arterial retention of cholesterol-rich apolipoprotein-B-containing lipoproteins in the pathogenesis of atherosclerosis: a triumph of simplicity. *Curr Opin Lipidol*. 2016 Oct;27(5):473-83.
- Lamarche B, Moorjani S, Lupien PJ, et al. Apolipoprotein A-I and B levels and the risk of ischemic heart disease during a five-year follow-up of men in the Quebec cardiovascular study. *Circulation*. 1996 Aug 1;94(3):273-8.
- Masson W, Siniawski D, Lobo M, et al. Association between LDL-C, Non HDL-C, and Apolipoprotein B Levels with Coronary Plaque Regression. *Arq Bras Cardiol*. 2015 Jul;105(1):11-9.
- Umar M, Sastry KS, Chouchane AI. Role of Vitamin D Beyond the Skeletal Function: A Review of the Molecular and Clinical Studies. *Int J Mol Sci*. 2018 May 30;19(6).
- Meehan M, Penckofer S. The Role of Vitamin D in the Aging Adult. *J Aging Gerontol*. 2014 Dec;2(2):60-71.
- Liu X, Baylin A, Levy PD. Vitamin D deficiency and insufficiency among US adults: prevalence, predictors and clinical implications. *Br J Nutr*. 2018 Apr;119(8):928-36.
- Goto A, Noda M, Matsushita Y, et al. Hemoglobin a1c levels and the risk of cardiovascular disease in people without known diabetes: a population-based cohort study in Japan. *Medicine (Baltimore)*. 2015 May;94(17):e785.
- Available at: <https://www.fda.gov/food/cfsan-constituent-updates/fda-announces-new-qualified-health-claims-epa-and-dha-omega-3-consumption-and-risk-hypertension-and>. Accessed February 22, 2021.
- Harris WS, Del Gobbo L, Tintle NL. The Omega-3 Index and relative risk for coronary heart disease mortality: Estimation from 10 cohort studies. *Atherosclerosis*. 2017 Jul;262:51-4.



# 2

## ways to save



### PREMIER REWARDS



### FREE

Unlimited  
Shipping



### 4%

Back On  
Purchases



### \$50 Instant Credit

Use now or  
save for later.



### Worry-Free

No auto-enrollment.  
Cancel anytime.

### JOIN PREMIER TODAY!

ONLY \$49.95 PER YEAR.

[LifeExtension.com/YourPremier](http://LifeExtension.com/YourPremier)



### AUTOSHIP & SAVE

Save an average of 16%  
on your supplements!\*



### FREE Shipping

We ship to any address in the United  
States (including Alaska and Hawaii)  
regardless of order size.



### LOWEST Prices

Always pay the lowest price for your  
favorite Life Extension® products.



### NEWEST Formulations

Always receive the latest version of  
our innovative formulas.

Complimentary program! Cancel any time

[LifeExtension.com/AutoShip](http://LifeExtension.com/AutoShip)

Call 1-855-867-9361 | Please use code **REWARDS**

\*Average savings based on the average AutoShip discount across all products. Premier service expires 12 months after date of purchase or renewal and can only be renewed 6 months after Premier purchase or renewal. Includes FREE standard delivery (2 to 5 business days) to any mailing address within the United States, excluding U.S. territories. Discounts on non-standard and international shipping also available. International customers pay \$59.95 for Premier. During checkout, redeem LE Dollars (one is equal to \$1 U.S. Dollar) to purchase products, blood tests, sale items, and shipping fees.



# LAB TEST

## Annual Super Sale

March 22 - July 12, 2021



### 1-2-3 EASY How it works:

#### ORDER

Call 1- 800-208-3444 toll-free or visit  
[LifeExtension.com/LabServices](http://LifeExtension.com/LabServices).

#### DRAW

For blood tests, take your form to a local lab.  
Collect at home for saliva, breath, etc.

#### REVIEW

Go over results **for free** with  
our Wellness Specialists by calling  
**1-800-226-2370**. You may wish to  
review them with your doctor as well.

**IT'S THAT SIMPLE!  
DON'T DELAY! CALL TODAY!**

#### For Our Local Customers:

For those residing in the Ft. Lauderdale, Florida, area, blood-draws are also performed at the Life Extension Nutrition Center from 9 a.m. to 2 p.m. Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address is:

**5990 NORTH FEDERAL HIGHWAY  
FT. LAUDERDALE, FL, 33308-2633**

#### Terms and Conditions

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



LAB TEST  
SALE PRICE

### MALE AND FEMALE PANELS

- **MALE PANEL — NOW WITH FERRITIN (LC322582)** **\$224**  
**CBC/Chemistry/Lipids Panel** • DHEA-S • PSA (prostate-specific antigen) • Homocysteine • C-Reactive Protein (high sensitivity) • ApoB • Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c • Insulin • Magnesium
- **FEMALE PANEL — NOW WITH FERRITIN (LC322535)** **\$224**  
**CBC/Chemistry/Lipids Panel** • DHEA-S • Estradiol • Homocysteine • ApoB • C-Reactive Protein (high sensitivity) • Progesterone • Free Testosterone • Total Testosterone • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c • Insulin • Magnesium

### CARDIAC RISK ASSESSMENTS

- **NMR LIPOPROFILE® (LC123810)** **\$74.25**  
The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.
- **NMR LIPOPROFILE PLUS\* (LC100049) - NEW LOWER PRICE!** **\$201.75**  
In-depth analysis of cardiovascular risk markers including: NMR LipoProfile, C-Reactive Protein, Myeloperoxidase, and **Oxidized LDL**.
- **OXIDIZED LDL (LC123023)** **\$56.25**  
Oxidized low-density lipoprotein (LDL) cholesterol is one of the main causes of the formation of atherosclerotic plaque in the arterial wall. This blood test measures levels of oxidized LDL.
- **MYELOPEROXIDASE (MPO)\* (LC123006)** **\$74.25**  
The myeloperoxidase (MPO) test measures levels of an enzyme that oxidizes low-density lipoprotein (LDL) cholesterol, which could lead to increased arterial plaque formation.
- **ADVANCED OXIDIZED LDL PANEL\* (LC100035)** **\$198.75**  
This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase, and Oxidized LDL.
- **OMEGA-3 INDEX COMPLETE\*\* (LC100066)** **\$74.25**  
Beneficial for everyone! People not taking omega-3/fish oil should check their baseline Omega-3 Index to see if it is in the desirable or concerning range. Those taking Omega-3/fish oil supplements should take the test to see if they need to adjust their dosage. You want to target a range of **8%-12%** for your Omega-3 Index score.

### CONDITION-SPECIFIC TESTS

- **PERSONALIZED AMINO ACID HEALTH ASSESSMENT\*\* (LC100090)** **\$224.25**  
An in-depth analysis of amino acid metabolism provides insight into various health concerns, such as maldigestion, GI dysbiosis, neurological issues and more, with a personalized report of diet and supplementation suggestions. Provided as an at-home urine collection kit.
- **COMPREHENSIVE VAGINOSIS PROFILE\*\*\* (LC100091)** **\$111.75**  
This test uses a simple, self-collection swab to measure both healthy and unhealthy vaginal microflora to determine if there's a problem. Susceptibility testing is performed on problematic microorganisms to determine effective remedies.

## ANNUAL LAB TEST PANELS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | LAB TEST<br>SALE PRICE |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | LAB TEST<br>SALE PRICE |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>GI 360 PROFILE™ *** (LC100088)</b><br>Next generation, innovative, comprehensive and clinically-applicable stool profile to help assess gastrointestinal health concerns. Microbiome map, stool chemistry, PCR-based pathogen detection, susceptibility testing, and more!                                                                                                                                                                                                                                                                                                                                          | <b>\$379.25</b>        | <b>FEMALE ELITE PANEL* (LC100017)</b><br><b>CBC/Chemistry/Lipids Panel</b> • Free and total Testosterone • Estradiol • Total Lipids • Estrone • DHEA-S • Progesterone • Pregnenolone • DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>\$431.25</b>        |
| <b>TOXIC METALS PANEL (FECAL)*** (LC100076)</b><br>The results of fecal elemental analysis can help you identify and eliminate dietary exposure to toxic metals, while also assessing the body's natural excretion of metals. The panel tests Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, and Uranium.                                                                                                                                                                                                                                                | <b>\$127.50</b>        | <b>FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011)</b><br><b>CBC/Chemistry/Lipids Panel</b> • DHEA-S • Estradiol • Total Estrogens • TSH • Free T3 • Progesterone • Pregnenolone • Total and Free Testosterone • SHBG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>\$224.25</b>        |
| <b>NEUROTRANSMITTER PANEL-COMPREHENSIVE*** (LC100085)</b><br>Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate, Glycine, Histamine, PEA, DOPAC, 3-MT, Normetanephrine, Metanephrine, 5-HIAA, Tryptamine, Tyrosine, Tyramine, Taurine. Alterations in neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, craving, addictions, pain, and more. Not available in NY.                                                                                                               | <b>\$221.25</b>        | <b>FEMALE BASIC HORMONE PANEL (LC100013)</b><br>DHEA-S • Estradiol • Total and Free Testosterone • Progesterone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>\$56.25</b>         |
| <b>MTHFR/COMT GENETIC METHYLATION PROFILE** (LC100045)</b><br>Detect genetic variation in methylation, important for brain health, cardiovascular health, and more.                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>\$111.75</b>        | <b>WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028)</b><br><b>CBC/Chemistry/Lipids Panel</b> • DHEA-S • Free and Total Testosterone • Estradiol • Progesterone • Cortisol • TSH • Free T3 • Free T4 • Reverse T3 • Insulin • Hemoglobin A1c • Vitamin D 25-hydroxy • C-reactive protein (high sensitivity) • Ferritin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>\$206.25</b>        |
| <b>APOE GENETIC TEST FOR ALZHEIMER'S AND CARDIAC RISK** (LC100059)</b><br>Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglyceride levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing late onset Alzheimer's disease. According to the National Institutes of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer's disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele. | <b>\$111.75</b>        | <b>HEALTHY AGING PANEL-COMPREHENSIVE* (LC100026)</b><br><b>CBC/Chemistry/Lipids Panel</b> • C-reactive protein (high sensitivity) • Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c • TSH • Free T3 • Free T4 • Ferritin • Urinalysis • ApoB • Insulin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>\$186.75</b>        |
| <b>FOOD SAFE ALLERGY TEST – BASIC*** (LCM73001)</b><br>This test measures delayed (IgG) food allergies for 95 common foods.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>\$148.50</b>        | <div> <b>CBC/CHEMISTRY/LIPIDS PANEL</b><br/>           These <b>CBC/Chemistry/Lipids Panel</b> tests are <u>included</u> in the popular <b>Male and Female Panels</b>, and other panels on this page so you don't have to order them separately.           <div> <b>CARDIOVASCULAR RISK</b><br/>           Total Cholesterol • HDL Cholesterol • LDL Cholesterol Triglycerides Cholesterol/HDL Ratio • Estimated CHD Risk • Glucose<br/> <b>LIVER FUNCTION</b><br/>           AST (SGOT) • ALT (SGPT) • LDH • Total Bilirubin • Alkaline phosphatase<br/> <b>KIDNEY FUNCTION</b><br/>           BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid<br/> <b>BLOOD PROTEINS</b><br/>           Total Protein • Albumin • Globulin • Albumin/Globulin Ratio<br/> <b>BLOOD COUNTS</b><br/>           Red Blood Cell Count • White Blood Cell Count • Eosinophils Neutrophils (Absolute) • Lymphs (Absolute) • Eos (Absolute) Baso (Absolute) • RDW • Monocytes (Absolute) • Monocytes Lymphocytes • Platelet Count • Hemoglobin • Hematocrit MCV • MCH • MCHC • Neutrophils<br/> <b>BLOOD MINERALS</b><br/>           Calcium • Potassium • Sodium • Chloride • Iron           <p>The price for the <b>CBC/Chemistry/Lipids Panel</b> alone is <b>\$35. (LC381822)</b> Sale price is <b>\$26.25</b></p> </div> </div> |                        |
| <b>FOOD SAFE ALLERGY TEST – EXTENDED*** (LCM73002)</b><br>This test measures delayed (IgG) food allergies to an additional 95 foods.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>\$148.50</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| <b>FOOD SAFE ALLERGY TEST – COMBO*** (LCM73003)</b><br>This test measures delayed (IgG) food allergies to all 190 foods found in our Basic and Extended panels.                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>\$281.25</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| WHOLE-BODY HEALTH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| <b>MALE ELITE PANEL* (LC100016)</b><br><b>CBC/Chemistry/Lipids Panel</b> • Free and Total Testosterone • Estradiol • Total Estrogens • DHEA-S • Progesterone • Pregnenolone • TSH • DHT • FSH • LH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Free and Total PSA • Vitamin D 25-OH • hs-CRP, ferritin • Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium                                                                                                                                                                                                                                   | <b>\$431.25</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| <b>MALE COMPREHENSIVE HORMONE PANEL* (LC100010)</b><br><b>CBC/Chemistry/Lipids Panel</b> • DHEA-S • Estradiol • DHT • PSA • TSH • Pregnenolone • Total and Free Testosterone • SHBG • Free T3                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>\$224.25</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| <b>MALE BASIC HORMONE PANEL (LC100012)</b><br>DHEA-S • Estradiol • Total and Free Testosterone • PSA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>\$56.25</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |

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

- \* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit. Customer is responsible for obtaining dry ice.
- \*\* This test is packaged as a kit.
- † Not available in NY.

Lab tests available in the continental United States and Anchorage, AK only. Restrictions apply in NY, NJ, RI, and MA. Not available in MD. Kits not available in PA.



# Can You Afford to be Deficient?

(For about 12 cents a day)

BY CHANCELLOR FALOON

Vitamin D impacts our health from immunity to heart health.  
Here is an update on some vitamin D studies in recently published articles:

- Supplementing with vitamin D was associated with a lower rate of **rhinovirus infection** (the most common virus causing colds) in asthmatic children compared to children who were not supplemented.<sup>1</sup>
- **Crohn's** disease patients had significantly lower vitamin D blood levels than healthy controls.<sup>2</sup>
- **Tuberculosis** patients were twice as likely to have vitamin D deficiency compared to patients without tuberculosis.<sup>3</sup>
- Vitamin D deficiency is associated with elevated **oxidative stress** across multiple age groups.<sup>4</sup>
- Patients with benign paroxysmal positional **vertigo** who received conventional treatment plus vitamin D and calcium supplementation showed a lower rate in the annual recurrence of vertigo attacks compared to those who received conventional treatment only.<sup>5</sup>
- **Coronary artery bypass** patients supplemented with acute dosing of vitamin D (**150,000 IU** of vitamin D daily for three days) before surgery had significantly lower indicators of **heart** cell death.<sup>6</sup>
- *Higher* vitamin D blood levels were associated with a better response to the **hepatitis B vaccine**. However, vitamin D supplementation starting on the **third day** following vaccination was not associated with a better vaccine response compared to controls.<sup>7</sup>
- A review of the scientific literature concluded that there is convincing evidence that vitamin D supplementation is valuable for the treatment and prevention of **erectile dysfunction**.<sup>8</sup>

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. Jartti T, Liimatainen U, Xepapadaki P, et al. Clinical correlates of rhinovirus infection in preschool asthma. *Allergy*. 2021 Jan;76(1):247-54.
2. Yang Y, Cui X, Li J, et al. Clinical evaluation of vitamin D status and its relationship with disease activity and changes of intestinal immune function in patients with Crohn's disease in the Chinese population. *Scand J Gastroenterol*. 2021 Jan;56(1):20-9.
3. Jaimni V, Shasty BA, Madhyastha SP, et al. Association of Vitamin D Deficiency and Newly Diagnosed Pulmonary Tuberculosis. *Pulm Med*. 2021;2021:5285841.
4. Camara AB, Brandao IA. The relationship between vitamin D deficiency and oxidative stress can be independent of age and gender. *Int J Vitam Nutr Res*. 2021 Jan;91(1-2):108-23.
5. Jeong SH, Kim JS, Kim HJ, et al. Prevention of benign paroxysmal positional vertigo with vitamin D supplementation: A randomized trial. *Neurology*. 2020 Sep 1;95(9):e1117-e25.
6. Tasdighi E, Hekmat M, Beheshti M, et al. Vitamin D Treatment Attenuates Heart Apoptosis After Coronary Artery Bypass Surgery: A Double-Blind, Randomized, Placebo-Controlled Clinical Trial. *J Cardiovasc Pharmacol Ther*. 2020 Jul;25(4):338-45.
7. Kashi DS, Oliver SJ, Wentz LM, et al. Vitamin D and the hepatitis B vaccine response: a prospective cohort study and a randomized, placebo-controlled oral vitamin D3 and simulated sunlight supplementation trial in healthy adults. *Eur J Nutr*. 2021 Feb;60(1):475-91.
8. Canguven O, Al Malki AH. Vitamin D and Male Erectile Function: An Updated Review. *World J Mens Health*. 2021 Jan;39(1):31-7.



# Broccoli

## THE TREE OF LIFE

Just one daily **Optimized Broccoli and Cruciferous Blend** tablet provides you with the same potent cell-protective and hormone health-promoting benefits as fresh vegetables.

For maximum benefits and absorption this enteric-coated tablet contains two layers:

- **Vegetable extracts** from broccoli, watercress, cabbage, and rosemary, and
- **Myrosinase** to release **sulforaphane** in the small intestine.



Item #02368 • 30 enteric coated vegetarian tablets

1 bottle \$28.50 • 4 bottles \$26.50 each

For full product description and to order  
**Optimized Broccoli and Cruciferous Blend**,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

TrueBroc® Produced under US patents 5,725,895; 5,968,505; 5,968,567; 6,177,122; and 6,242,018 licensed from Brassica Protection Products LLC; TrueBroc® is a trademark of Brassica Protection Products LLC. BroccoVital® Myrosinase is a registered trademark of Berg Imports, LLC.

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.



# DOPAMINE

The “FEEL GOOD”  
Neurotransmitter

Feel Better,  
THINK  
More Clearly

*Dopamine, the “feel good” neurotransmitter, regulates motivation, mood, movement, and cognitive function.*

With age, dopamine levels *decline* due to the increase of the **MAO-B enzyme**.

**Amur Cork Tree** (Phellodendron bark) can help *preserve dopamine* by *inhibiting MAO-B* activity.

**Dopamine Advantage** provides **500 mg** of **Amur Cork Tree** in each capsule.

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

Note: Those who take MAO-B-inhibiting drugs like deprenyl do not need to take phellodendron.



## Dopamine Advantage

Item #02413 • 500 mg • 30 vegetarian capsules  
1 bottle **\$13.50** • 4 bottles \$12 each





# BROAD-SPECTRUM IMMUNE SUPPORT

**Lactoferrin** is a component of **whey 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.



For full product description and to order  
**Lactoferrin Caps**, call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**Item #01681** • 300 mg, 60 vegetarian capsules  
1 bottle **\$45** • 2 bottles **\$40** each  
(Two-Month Supply)

Contains milk.

Bioferrin® is a registered trademark of Glanbia.

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.



# DEFEND YOUR HEALTH

## VITAMIN D3

Systemic support for immune  
function, bone health, and  
normal blood-sugar levels.



Item #01713 • 5,000 IU • 60 softgels  
1 bottle \$7.50 • 4 bottles \$6.50 each

For full product description  
and to order **Vitamin D3**,  
call 1-800-544-4440 or  
visit [www.LifeExtension.com](http://www.LifeExtension.com)



**CAUTION:** Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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.



BOOSTS HEART HEALTH

# GLUCOSAMINE

## BEYOND JOINT HEALTH



**Glucosamine** has been used for decades to support **joint function** and **protect cartilage**.

New studies reveal it may also promote **heart health** and beneficial **autophagy**.

Large cohort studies showed that people who took **glucosamine** were more likely to live longer, healthier lives.<sup>1-4</sup>

Each capsule of this new formula provides **750 mg of glucosamine**.

### HIGH DOSE + LOW COST Glucosamine Sulfate

Item #02420 • 750 mg, 60 capsules  
1 bottle \$12 • 4 bottles \$10.50 each



#### References

1. *Eur J Epidemiol.* 2012 Aug;27(8):593-603.
2. *J Am Board Fam Med.* 2020 Nov-Dec;33(6):842-7.
3. *Ann Rheum Dis.* 2020 Jun;79(6):829-36.
4. *Am J Clin Nutr.* 2010 Jun;91(6):1791-800.

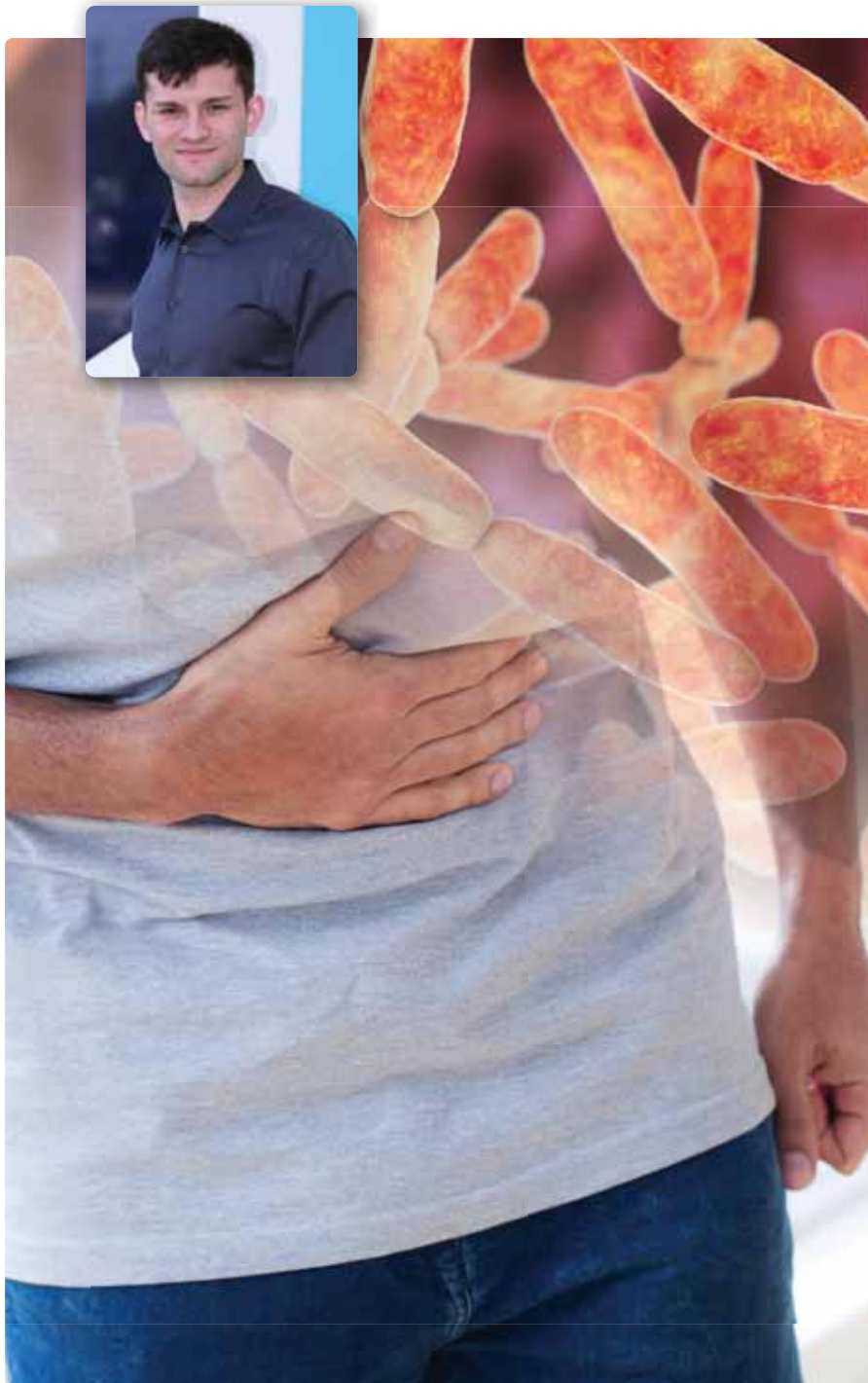


For full product description and to order **Glucosamine Sulfate**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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

# What is Glutamine?

BY CHANCELLOR FALOON



There are 20 amino acids utilized by our genetic code to manufacture proteins. **Glutamine** is the most abundant and versatile.<sup>1</sup>

Research shows that it may improve **digestive** and **gut health** and enhance the body's response to **exercise**.<sup>1,2</sup>

Researchers consider glutamine to be **semi-essential** because the body often doesn't produce enough.<sup>3</sup> The difference needs to be made up by oral intake.

Many people take whey or vegan protein, which already contains glutamine. For some individuals, however, this might not be sufficient.

While glutamine is found throughout the body, about **30%** of total glutamine is used just in the **intestines**.<sup>4</sup> Because of this, a depletion of glutamine can be especially consequential to gut health.



Three randomized, controlled studies have shown that glutamine use benefits intestinal health:

- Thirty-three obese or overweight adults received either **glutamine** or the amino acid **L-alanine** for two weeks to analyze changes in gut microbiota.<sup>5</sup> Those who received glutamine had a decreased ratio of *Firmicutes* bacteria to *Bacteroidetes* bacteria. Imbalance of this ratio is considered dysbiosis. Higher ratios are usually seen in obesity and in inflammatory bowel disease (IBD).<sup>6</sup> The **improved gut microbiota balance** with the use of glutamine suggests it is a good candidate to help restore gut flora balance.
- Ten active men received glutamine or a placebo before intense exercise, to study **gastrointestinal permeability** differences post-exercise.<sup>7</sup> Increased intestinal permeability, also known as “**leaky gut**,” is related to multiple digestive disorders. Those taking glutamine had *decreased* gastrointestinal permeability compared to those in the placebo group.

- In a larger study, 106 participants with **irritable bowel syndrome** took glutamine or a placebo for eight weeks.<sup>8</sup> Irritable bowel syndrome severity scores were *reduced* by **50 points** or more in **79.6%** of the glutamine group but in only **5.8%** of the placebo group.

Additional studies have shown that glutamine may:

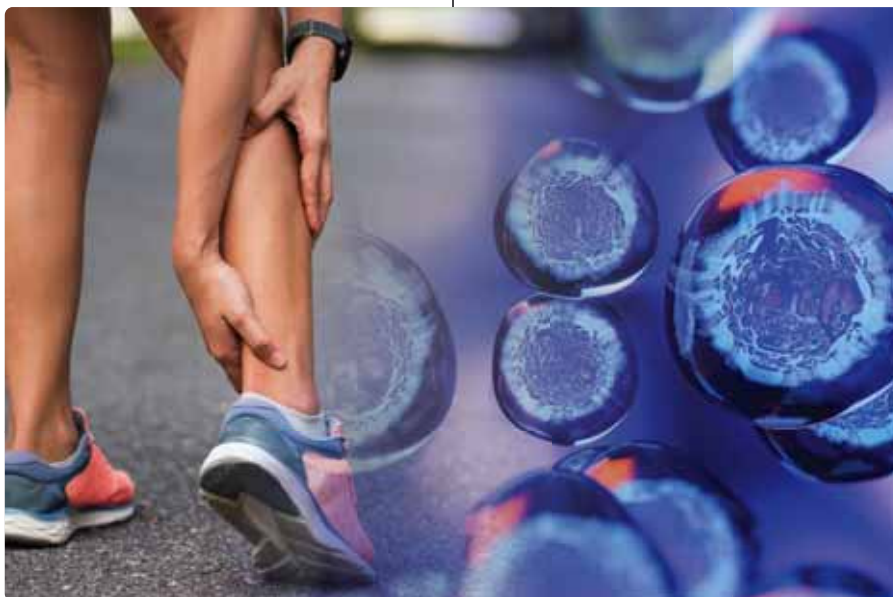
- Improve **immune function** in heavy-load-training athletes,<sup>9</sup>
- Reduce the accumulation of **blood ammonia** (believed to be a cause of fatigue) in high-level endurance athletes,<sup>10</sup>
- Decrease **muscle soreness** following eccentric exercise (a workout in which the muscles get longer in response to a force, for instance, the downward phase of a biceps curl),<sup>11</sup>
- Reduce symptoms for **sickle cell anemia** patients,<sup>12</sup> and
- Reduce chemotherapy- and radiation-induced **mucositis** (inflammation of the mucous membrane) in cancer patients.<sup>13</sup>

To summarize, research has shown that **glutamine** can improve **intestinal health** and **exercise response**. •

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. Cruzat V, Macedo Rogero M, Noel Keane K, et al. Glutamine: Metabolism and Immune Function, Supplementation and Clinical Translation. *Nutrients*. 2018 Oct 23;10(11).
2. Kim MH, Kim H. The Roles of Glutamine in the Intestine and Its Implication in Intestinal Diseases. *Int J Mol Sci*. 2017 May 12;18(5).
3. Xiao D, Zeng L, Yao K, et al. The glutamine-alpha-ketoglutarate (AKG) metabolism and its nutritional implications. *Amino Acids*. 2016 Sep;48(9):2067-80.
4. Kim MH, Kim H. The Roles of Glutamine in the Intestine and Its Implication in Intestinal Diseases. *Int J Mol Sci*. 2017 May 12;18(5):1051.
5. de Souza AZ, Zamboni AZ, Abboud KY, et al. Oral supplementation with L-glutamine alters gut microbiota of obese and overweight adults: A pilot study. *Nutrition*. 2015 Jun;31(6):884-9.
6. Stojanov S, Berlec A, Štrukelj B. The Influence of Probiotics on the Firmicutes/Bacteroidetes Ratio in the Treatment of Obesity and Inflammatory Bowel disease. *Microorganisms*. 2020 Nov 1;8(11).
7. Pugh JN, Sage S, Hutson M, et al. Glutamine supplementation reduces markers of intestinal permeability during running in the heat in a dose-dependent manner. *Eur J Appl Physiol*. 2017 Dec;117(12):2569-77.
8. Zhou Q, Verne ML, Fields JZ, et al. Randomised placebo-controlled trial of dietary glutamine supplements for postinfectious irritable bowel syndrome. *Gut*. 2019 Jun;68(6):996-1002.
9. Song QH, Xu RM, Zhang QH, et al. Glutamine supplementation and immune function during heavy load training. *Int J Clin Pharmacol Ther*. 2015 May;53(5):372-6.
10. Carvalho-Peixoto J, Alves RC, Cameron LC. Glutamine and carbohydrate supplements reduce ammonia increase during endurance field exercise. *Appl Physiol Nutr Metab*. 2007 Dec;32(6):1186-90.
11. Legault Z, Bagnall N, Kimmerly DS. The Influence of Oral L-Glutamine Supplementation on Muscle Strength Recovery and Soreness Following Unilateral Knee Extension Eccentric Exercise. *Int J Sport Nutr Exerc Metab*. 2015 Oct;25(5):417-26.
12. Niihara Y, Miller ST, Kanter J, et al. A Phase 3 Trial of L-Glutamine in Sickle Cell Disease. *N Engl J Med*. 2018 Jul 19;379(3):226-35.
13. Sayles C, Hickerson SC, Bhat RR, et al. Oral Glutamine in Preventing Treatment-Related Mucositis in Adult Patients With Cancer: A Systematic Review. *Nutr Clin Pract*. 2016 Apr;31(2):171-9.



# STRONGER BONES STRONGER YOU

Some people require *extra* support for optimal bone strength and flexibility.

**Bone Strength Collagen Formula** provides collagen as a patented **chelated calcium** designed to support bone health.

Magnesium, silicon, dried plum, vitamin D3, and boron are included to further skeletal support.

For full product description and to order **Bone Strength Collagen Formula**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

KoAct® is a patented form of bone collagen with calcium designed to support bone strength and maintain optimal bone health. KoAct® is a registered trademark of AIDP, Inc. Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. Patent No. 5,962,049.

Item #01725 • 120 capsules

1 bottle \$33.75 • 4 bottles \$30 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.



Promote Healthy *Muscle Strength* at any Age

# STAY STRONG & YOUNG

**Muscle Strength & Restore Formula** provides ingredients that can enhance **muscle strength** while helping reduce loss of muscle mass that occurs with normal aging. It contains:

- **HMB (Beta-hydroxy beta-methylbutyrate):** increases and preserves muscle mass in adults of all ages.
- **Vitamin D3 • 25 mcg (1,000 IU):** supports muscle strength and performance.

Mix one scoop with approximately **8 oz.** of cold water or other beverage, preferably a protein shake, and drink once daily or as recommended by a health practitioner.



**Item #02221** • About 30 servings  
94.2 g (3.32 oz) Container  
1 container **\$27**  
4 containers **\$24** each



For full product description and to order  
**Wellness Code® Muscle Strength & Restore Formula**,  
call **1-800-544-4440** or visit **[www.LifeExtension.com](http://www.LifeExtension.com)**

Uses of CaHMB and Vitamin D are licensed under  
U.S. Patent Nos. 8,815,280, 9,259,430, 9,539,224 and 9,707,241.

**CAUTION:** Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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.



# Glutamine

More than  
Strong Muscles

Glutamine is an amino acid used by athletes to support protein synthesis and cellular energy.

Low-cost glutamine also helps support immune, intestinal, and brain health.

Available in capsules or powder.



## L-Glutamine Capsules

Item #00345 • 500 mg

100 vegetarian capsules

1 bottle **\$11.25** • 4 bottles \$10 each



## L-Glutamine Powder

Item #00141 • 100 grams (0.22 LB)

1 bottle **\$16.50** 4 bottles \$15 each



For full product description and to order  
**L-Glutamine Capsules** or **L-Glutamine Powder**, call  
1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



Support Healthy  
Immune Function  
with  
**WHEY  
Protein**



(Whey Concentrate)



(Whey Isolate)



(Whey + Creatine + Glutamine)

**Whey protein**, packed with vital amino acids, promotes **glutathione** synthesis.

**Glutathione** plays an important role in supporting **immune** balance in the body.<sup>1-3</sup>

Whey fractions help modulate a full range of healthy bodily functions.

**References**

1. *Int J Gen Med.* 2011 Jan 25;4:105-13.
2. *Br J Nutr.* 2000 Nov;84 Suppl 1:S81-9.
3. *J Dairy Sci.* 2000 Jun;83(6):1187-95.

For full product description and to order **Wellness Code®** Whey Protein Concentrate, Whey Isolate, or Advanced Whey Isolate with Glutamine and Creatine, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

*Choose the Best Whey for You!*

- ➔ **WHEY CONCENTRATE** (chocolate or vanilla flavor)  
Pure whey with the water removed.  
Contains 80% easy-to-digest protein.

**Item #02260 Vanilla • Item #02261 Chocolate**  
**1 container \$22.50 • 2 containers \$19.95 each**

- ➔ **WHEY ISOLATE** (chocolate or vanilla flavor)  
Filtered to reduce carbohydrates, lactose and fat.  
Contains 98% protein with some lactose.

**Item #02242 Vanilla\* • Item #02243 Chocolate\***  
**1 container \$22.50 • 2 containers \$19.50 each**

- ➔ **ADVANCED WHEY ISOLATE**  
**with GLUTAMINE and CREATINE**  
A premium isolate for greater strength and exercise performance. **Item #02246 Vanilla\***  
**1 container \$22.50 • 2 containers \$19.50 each**

Contains milk. Use these products as a food supplement only. Do not use for weight reduction.



\* Proven® is a registered trademark of Glanbia plc.

—LAURIE MATHENA



## Superiority Burger

**MAKES 8 TO 10 PATTIES**

- 1 cup red quinoa
- 1 medium yellow onion, chopped
- 2 teaspoons ground toasted fennel seeds
- 1 teaspoon chili powder
- 1 cup cooked chickpeas, rinsed and drained
- 1 teaspoon white wine vinegar
- 1 cup small-diced carrots
- ½ cup coarse breadcrumbs
- ¾ cup walnuts, toasted and crushed
- Juice of 1 lemon
- 1 tablespoon chopped fresh flat-leaf parsley
- 1 tablespoon hot chili sauce
- 2 tablespoons non-modified potato starch
- Grapeseed oil for searing the patties

Toasted buns/shredded lettuce/  
roasted tomatoes/2 pickle slices/  
Muenster cheese (if you like)/  
sauces of your choice (like Special  
Sauce, see next page) for serving

Preheat the oven to 425°F.

Cook the quinoa in 1½ cups unsalted water until fluffy, about 45 minutes. Cool and reserve. In a separate pan, sauté the onion until translucent and browned, and season with salt, pepper, the fennel, and chili powder. Add the chickpeas and keep on the heat for 5 to 10 minutes, stirring constantly. Deglaze the hot pan with the white wine vinegar and scrape everything stuck to

the bottom of the pan back into the mix. Using a potato masher, roughly smash the onion-chickpea mixture. Mix the chickpea mash by hand with the cooled quinoa.

Roast the carrots in the oven until dark around the edges and soft, about 25 minutes. Add to the chickpea-quinoa mixture. Add the breadcrumbs, walnuts, lemon, parsley, and chili sauce, and season again with salt and pepper, until it tastes sharp. Mix the potato starch with 1 tablespoon water to create a cloudy,

thick slurry. Fold the slurry into the burger mix as the binding agent. Form the mixture into 8 to 10 patties and sear in grapeseed oil in a hot sauté pan or cast-iron skillet until fully browned, about 3 minutes on each side.

To serve, place each patty on a toasted bun with shredded iceberg lettuce, roasted red tomatoes, 2 pickle slices, Muenster cheese (if you like), and sauces such as Special Sauce.



## Special Sauce

MAKES ABOUT 2 CUPS

1 cup chickpea mayo  
(see on right)

½ cup roasted red tomatoes

¼ cup ketchup

¼ cup hot chile sauce

1 tablespoon red wine vinegar

Combine all the ingredients in a tall container just large enough to fit the top of an immersion blender. Blend until smooth and the tomatoes are broken up. Season with salt, if necessary, and a little bit of pepper. This can also be done in a food processor.

## Chickpea Mayo

MAKES ABOUT 2 CUPS

½ cup liquid from a chickpea can

20 individual chickpeas

1½ tablespoons Dijon mustard

2 tablespoons cider vinegar

1 tablespoon cane sugar

2 teaspoons kosher salt

2½ cups grapeseed oil

Combine the chickpea liquid, chickpeas, mustard, cider vinegar, sugar, and salt in a tall container just large enough to fit the head of an immersion blender. Blend at high speed until the mixture is completely smooth and all the whole chickpeas are broken down.

While the blender is running, slowly drizzle in the grapeseed oil. As you add the oil, an emulsion will form and it will begin to thicken. Check the seasoning for salt and sugar. This will keep, covered, in the refrigerator for about 1 week.

## Peas and Pesto

SERVES 6

6 cups packed basil leaves

1 garlic clove

½ cup marcona almonds, toasted  
and roughly chopped

1 cup extra virgin olive oil

1 pound shell-shaped pasta  
(we use gnocchi shape)

2 cups green peas, fresh or frozen  
(if fresh, blanched)

Bring a pot of salted water to a rolling boil. Prepare an ice bath. Blanch the basil leaves for only 5 seconds, until they turn bright green. Using a strainer or a spider, remove the leaves from the water and immediately plunge them into the ice bath. Save the blanching water.

Drain quickly and squeeze dry in a clean kitchen towel. Transfer the basil to a blender and add the garlic clove, almonds, and olive oil and puree until a smooth sauce forms. Transfer to a bowl and season with salt and pepper.

In the pot of boiling water, cook the pasta until just shy of al dente. Immediately strain in a colander and then spread out the pasta on two flat sheet trays to cool as quickly as possible.

Combine the cooked pasta with the pesto and peas in a large bowl. Toss thoroughly so that the pesto really thickly coats all the pasta (inside and out) and the peas begin to find their way into the cavities of the shells. If the sauce is too thick, a squirt of water will make it creamy. Check the seasoning for salt and pepper and serve immediately.





## Stuffed Green Peppers with Coconut and Iceberg

### SERVES 4

- 2 tablespoons grapeseed oil
- 1 pound firm tofu, drained well and roughly crumbled
- 2 tablespoons golden balsamic vinegar
- 2 tablespoons extra virgin olive oil, plus more for drizzling
- 1 medium yellow onion, cut into small dice
- 2 garlic cloves, minced
- 3 ears of corn, husked and kernels removed from the cob, or 2 cups creamed corn
- One 13-ounce can full-fat coconut milk
- 4 to 6 green bell peppers
- 2 cups shredded iceberg lettuce
- ¼ cup unsweetened coconut flakes, toasted
- 1 celery stalk, cut into small dice
- 2 tablespoons seasoned rice wine vinegar

Heat the grapeseed oil in a deep sauté pan over medium-high heat until shimmering. Add the crumbled tofu and cook until golden brown all over, about 8 minutes. Add the golden balsamic vinegar and cook for a little longer to let the sugar in the vinegar caramelize. Scrape the tofu into a bowl and set aside.

Rinse out the sauté pan and return to medium heat. Add the olive oil, onion, and a pinch of salt to the pan and cook, stirring often, until a deep brown color develops.

Add the garlic and cook for a minute more, until aromatic. Deglaze the pan with water if the onions are getting too brown and sticking to the bottom of the pan. Add the corn, coconut milk, and the cooked tofu. Let this simmer for about 15 minutes. Remove the pan from the heat and blend a little using either an immersion blender or a food processor. The mixture should have the consistency of thick chili. Add salt and black pepper as needed.

Preheat the oven to 375°F. Lightly oil an 8-by-8-inch baking dish.

Cut the bell peppers in half lengthwise, deseed using a little paring knife, and remove the stem if you are concerned about accidentally eating it. Stuff the peppers with the tofu mixture using a small spoon—use the back of the spoon to push the mixture into the pepper to fully fill it. Add enough filling to form a mound on top of the pepper.



Pack the peppers as tightly as possible into the baking dish with the stuffed part facing upward. Drizzle a little olive oil on top of the peppers, cover with aluminum foil, and cook, covered, for 25 minutes.

Crank the oven to 425°F and cook for another 15 minutes, until the filling is browned.

Serve these at room temperature or warm. Though the peppers are good on their own, a small salad of iceberg lettuce, toasted coconut, celery, and rice wine vinegar scattered over the top of the peppers right before serving is a nice garnish.

## Vegetable Soup with Curly Parsley

### SERVES 6

Extra virgin olive oil  
 3 medium yellow onions, finely chopped  
 2 carrots, cut into small dice  
 3 celery stalks, cut into small dice  
 2 red bell peppers, cut into small dice  
 4 garlic cloves, minced  
 2 tablespoons tomato paste  
 ½ cup dry white wine  
 6 cups water  
 ½ head green cabbage, cut into ¼-inch ribbons  
 Red wine vinegar (optional)  
 1 bunch greens (kale or Swiss chard), stems removed, torn into small pieces  
 Fresh curly parsley  
 White Italian bread, toasted, drizzled with extra virgin olive oil, rubbed with a garlic clove, and sprinkled with salt

Heat a slick of olive oil in a large deep soup pot over medium-high heat. Add the onions and a big pinch of salt and cook, stirring frequently, until the onions are starting to brown and are translucent, about 10 minutes.

Add the carrots, celery, and bell peppers to the pot and cook for about 8 minutes more. Add the garlic and tomato paste. Cook for at least 5 more minutes, until the tomato paste starts to brown and stick to the bottom of the pan. Add the white wine and scrape up any stuck bits from the pot. Add the water and another large pinch of salt and bring to a boil.

Reduce heat, add the cabbage, and let simmer, just until the cabbage starts to get soft, about 10 minutes. Check the seasoning for salt and acidity (add a little red wine vinegar if the soup tastes flat) and black pepper.

When ready to eat, add the greens to the very hot soup and let them wilt and turn a vibrant green color. Serve with a scattering of parsley, and a slice of the toasted bread.

## SUPERIORITY BURGER COOKBOOK

THE VEGETARIAN HAMBURGER  
IS NOW DELICIOUS



BROOKS HEADLEY

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

Excerpted from *Superiority Burger Cookbook:  
The Vegetarian Hamburger Is Now Delicious.*

Copyright © 2018 by Brooks Headley. Used with permission of the publisher, W. W. Norton & Company, Inc. All rights reserved.

To order a copy of *Superiority Burger Cookbook*, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**Item #34182 • Price: \$22.46**



# Keep Your ENERGY UP

Occasional feelings of fatigue happen to everyone.

Scientists have found that an extract of **French oak wood** contains compounds that fight fatigue *at the cellular level*.\*

**Energy Renew** contains a proprietary extract of French oak wood that can help promote healthy energy levels.

Item #01900 • 30 vegetarian capsules  
1 bottle \$27 • 4 bottles \$24.75 each

For full product description and to order **Energy Renew**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



Robuvit® is a registered trademark of Horphag Research and the use of this product is under International patent applications.

\* J Agric Food Chem. 2014 Jan 15;62(2):443-53.



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.

# Cauliflower

BY LAURIE MATHENA



## References

1. *Rocz Panstw Zakl Hig.* 2012;63(4):389-95.
2. *Food Chemistry*. 2012 2012/05/15;132(2):1003-9.
3. *Am J Clin Nutr.* 2011 Jul;94(1):240-6.

Cauliflower has been a dinner staple for hundreds of years, but its popularity has recently increased with the invention of a new way to eat it: as *cauliflower rice*.

Cauliflower rice has the look and feel of rice, but is low in calories and carbs, and high in vitamins and minerals. But whether you're eating it steamed, roasted, or as a rice substitute, cauliflower's health benefits remain the same.

Cauliflower is a member of the *cruciferous* family of vegetables.

The health benefits of cruciferous vegetables like cauliflower are due in part to their **phytochemicals**, which have been shown to help induce detoxification, stimulate immune function, decrease the risk of certain cancers, inhibit DNA mutations, and reduce the proliferation of cancer cells.<sup>1</sup>

Cauliflower is also rich in **glucosinolates**, which are sulfur-containing compounds regarded as promising tools that reduce free-radical damage.<sup>2</sup>

Studies have also shown that compared to those with the lowest intake, people who eat the most cruciferous vegetables, like cauliflower, broccoli, and cabbage, have a decreased risk of overall **mortality**, especially death from **cardiovascular disease**.<sup>3</sup>

To make cauliflower rice, grate the cauliflower head using a box grater, then press it into an absorbent towel to remove excess moisture. It can be eaten raw or used as a rice substitute in dishes like stir-fries, risotto, tabouleh, or casseroles.



## ACTIVE LIFESTYLE & FITNESS

- 01529 Creatine Capsules
- 02318 Keto Brain and Body Boost
- 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
- 02422 Vegan Vitamin D3

## BRAIN HEALTH

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02321 Cognitex® Basics
- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone
- 01540 DMAE Bitartrate (dimethylaminoethanol)
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 02212 Focus Tea™
- 01658 Ginkgo Biloba Certified Extract™
- 01527 Huperzine A

- 00020 Lecithin Granules
- 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
- 54160 Black Vinegar
- 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
- 01805 Asian Energy Boost
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 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
- 01647 PQQ Caps • 20 mg
- 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
- 00463 Flaxseed Oil
- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract

- 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 InSea® 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 (Dehydroepiandrosterone) 15 mg, 100 capsules
- 00335 DHEA (Dehydroepiandrosterone) 25 mg, 100 capsules
- 00882 DHEA (Dehydroepiandrosterone) 50 mg, 60 capsules
- 00607 DHEA (Dehydroepiandrosterone) 25 mg, 100 vegetarian dissolve in mouth tablets
- 01689 DHEA (Dehydroepiandrosterone) 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 with 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®
- 00955 Immune Protect with PARACTIN®
- 02005 Immune Senescence Protection Formula™
- 29727 Kinoko® Gold AHCC
- 24404 Kinoko® Platinum AHCC
- 00316 Kyolic® Garlic Formula 102
- 00789 Kyolic® Reserve
- 01681 Lactoferrin (Apolactoferrin) Caps
- 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 Boswellia
- 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
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 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
- 00550 Chlorella
- 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 Polyphenol Extract
- 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 with Beta-Sitosterol
- 01837 Pomi-T®
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

#### MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 30731 Ionic Selenium
- 01677 Iron Protein Plus
- 02403 Lithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrates)
- 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

#### 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
- 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 PEA 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 Bifido GI Balance
- 01825 FLORASSIST® Balance
- 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  
 80176 Collagen Boosting Peptide Cream  
 80156 Collagen Boosting Peptide Serum  
 02408 Collagen Peptides for Skin & Joints  
 80169 Cucumber Hydra Peptide Eye Cream  
 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 Intensive 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

## 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 Liquid Emulsified  
 02244 Liquid Vitamin D3 • 2,000 IU, 1 fl oz  
 02232 Liquid Vitamin D3 • 2,000 IU, 1 fl oz, mint  
 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  
 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  
 1,000 mg, 60 veg tablets  
 02227 Vitamin C and Bio-Quercetin Phytosome  
 1,000 mg, 250 veg tablets  
 01753 Vitamin D3 • 25 mcg (1,000 IU), 90 softgels  
 01751 Vitamin D3 • 25 mcg (1,000 IU), 250 softgels  
 01713 Vitamin D3 • 125 mcg (5,000 IU), 60 softgels  
 01718 Vitamin D3 • 175 mcg (7,000 IU), 60 softgels  
 01758 Vitamin D3 with Sea-Iodine™  
 02040 Vitamins D and K with Sea-Iodine™

## WEIGHT MANAGEMENT & BODY COMPOSITION

00658 7-Keto® DHEA Metabolite • 25 mg, 100 capsules  
 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  
 01292 Integra-Lean®  
 01908 Mediterranean Trim with Sinetrol™ -XPur  
 01492 Optimized Irvingia with Phase 3™ Calorie Control Complex  
 01432 Optimized Saffron  
 00818 Super CLA Blend with Sesame Lignans  
 01902 Waist-Line Control™  
 02151 Wellness Code® Appetite Control

## 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



# Expert **HELP WANTED** for Anti-Aging Clinical Trials

**Betterhumans, Inc.** is a fully funded 501(c)(3) biomedical research organization focused on translational anti-aging research.

**Life Extension®** and groups it supports have helped fund Betterhumans' groundbreaking research for decades.

Betterhumans is focused on bringing safe and efficacious anti-aging treatments from the lab to clinical trials as quickly as possible. They are looking to add two more full time research associates to their biomedical team, as follows:

**1. Biologicals Projects:** The researcher should have in-vitro transfection experience (general CRISPR hands-on experience along with cell culturing, flow cytometry, and Western Blotting desired). Betterhumans has a 400 square-foot clean room with two BioSpherix X2 containment hoods specifically to advance iPS, stem cells, and exosomes transplantation experiments.

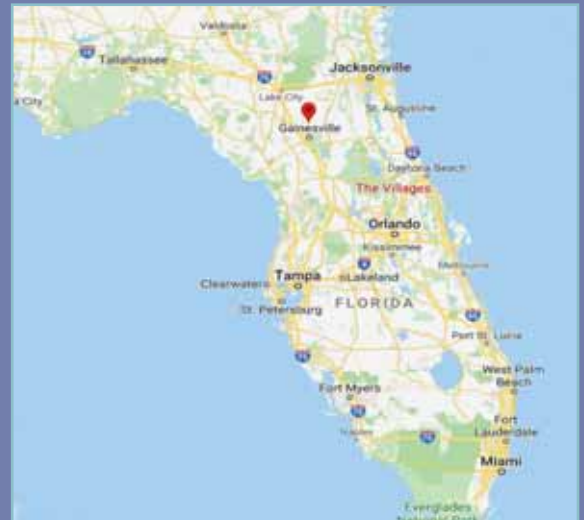
**2. Blood Analysis:** Betterhumans is also looking for an experienced scientist using immunofluorescence and genomic assays. This researcher would run assays on whole blood, plasma, and cell lysate on Bio-Plex 200, Quanterix SP-X, qPCR, Ion Torrent S5 and Illumina sequencing systems.

**Send your resume to:**  
**[jclement@betterhumans.org](mailto:jclement@betterhumans.org)**

Please only apply if you're a highly motivated researcher, passionate about making a difference in people's lives and prolonging healthy human lifespans!



**Betterhumans.org**



## **Gainesville, Florida**

is a progressive/liberal college town of about 125,000 with about 50,000 college students, a good medical school, veterinary school, and numerous health institutes. The city has a large Whole Foods, Trader Joe's, and lots of restaurants, but still has a low cost of living. No earthquakes or shoveling snow here.



# Tilt Your Bacteria Ratio for a Healthy Digestive Tract

**Phages** target bad intestinal bacteria, allowing beneficial strains to flourish.

**FLORASSIST® GI** provides a 7-strain blend of **probiotics** in a **dual encapsulation** formula to deliver beneficial bacteria and **phages** where you need them the most.



Dual-Encapsulation Delivery



Item #02125 • 30 liquid vegetarian capsules  
1 bottle **\$24.75** • 4 bottles \$22.50 each



For full product description and to order **FLORASSIST® GI with Phage Technology**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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





The Science of a Healthier Life®

PO BOX 407198  
FORT LAUDERDALE, FLORIDA 33340-7198



## IN THIS EDITION OF *LIFE EXTENSION*® MAGAZINE



### 7 HEART ATTACK MAKES DEADLY COMEBACK

Cardiovascular deaths are rising due to obesity and diabetes.



### 28 BRAIN PROTECTION FROM NOVEL VITAMIN B12

Two active forms of **vitamin B12** protect the aging brain.



### 40 CHALLENGES OF MIDDLE-OF-THE-NIGHT URINATION

A clinical trial using targeted supplements *reduced* **nighttime urination** in **64%** of male study subjects.



### 52 FISH OIL AND METABOLIC SYNDROME

**Omega-3** fatty acids found in fish oil can *decrease* the risk and *reverse* certain aspects of **metabolic syndrome**.



### 62 BLOOD TESTS TO BETTER PREDICT CARDIOVASCULAR RISK

Beyond standard lipid profiles, innovative **blood tests** better pinpoint cardiovascular vulnerabilities.



### 72 UPDATE ON VITAMIN D

Published research continues to show the impact of **vitamin D** on all aspects of human health.

VISIT US ONLINE AT [LIFEEXTENSION.COM](http://LIFEEXTENSION.COM)