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November 2024

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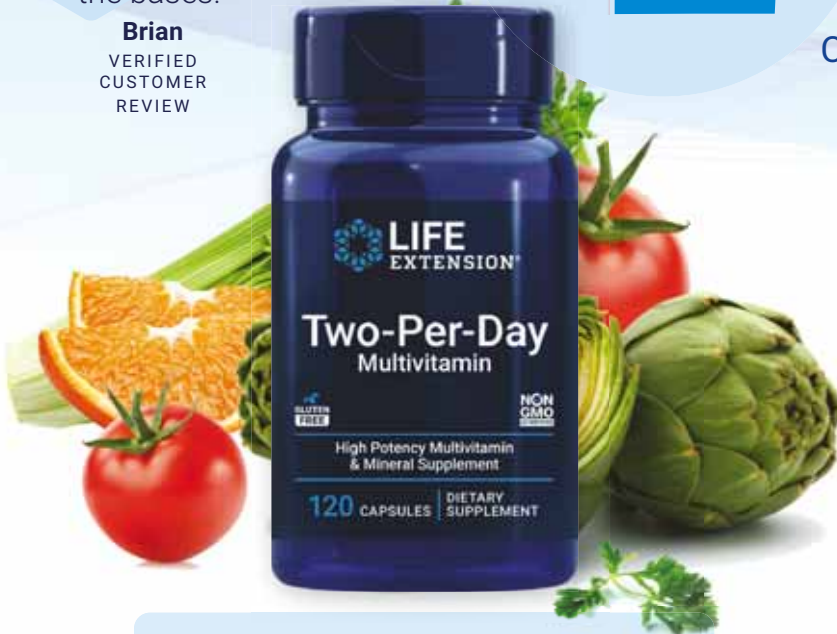
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REPORTS



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ON THE COVER**

**HELP YOUR HEART
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In a **clinical trial**, a plant extract **improved** the heart's **pumping ability**, **increased ejection fraction** and **reduced** physical **fatigue** by **23%**.

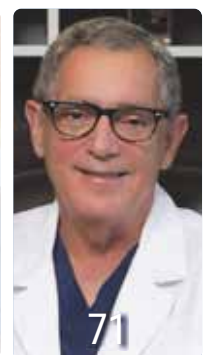
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DEPARTMENTS

- 7 **WHEN VITAMINS BECAME LEGAL**
 Before **October 1994**, the FDA raided vitamin companies at gunpoint, seizing supplements and sometimes arresting the owners.

 Thirty years ago, Congress amended the **Food, Drug and Cosmetic Act** to enable qualified health information to be disseminated to the public. In doing so, it prohibited the FDA from restricting the First Amendment protections of **free speech** and limited the FDA's authority to regulate dietary supplements. This resulted in the explosive growth of the industry.
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When Vitamins Became Legal



WILLIAM FALOON



A law took effect **30 years** ago that prohibited the **FDA** from **criminalizing** the dissemination of truthful, non-misleading information about dietary supplements.¹

Before **October 1994**, the FDA raided vitamin companies at gunpoint, seizing the vitamins and sometimes arresting the owners.²⁻⁴

Nutrients like **coenzyme Q10** were considered “**unapproved drugs**.” One company pled guilty to the crime of selling CoQ10 and providing information about it to the public.⁵

Consumers often stocked up on a year’s supply of nutrients in the event the FDA forcibly removed them from the market.

When the **FDA** threatened to convert many supplements into **prescription drugs**, consumers rebelled. **Congress** was inundated with mail asking that legislation be enacted to curb the FDA’s arbitrary powers.

Critics of the legislation predicted that without strict **FDA oversight**, a health catastrophe would erupt. They argued that mass injuries and deaths would occur if dietary supplements were not heavily regulated like **drugs** were.

Somehow, after **30 years**, the health catastrophe never happened with responsible supplement use.*

What did occur was the removal of dozens of FDA-approved **drugs** because of mass **injuries/deaths** that collectively cost pharmaceutical companies over \$25 billion in damages. Pharma still largely profited from selling **dangerous drugs** even when later paying enormous civil/criminal **penalties**.

As we mark three decades of greater **health freedom**, consumers often pay less per-milligram for **nutrients** today compared to what they cost prior to **October 1994**. Prescription drug prices, on the other hand, soared to exorbitant levels.

The majority of Americans now take supplements⁶ and are able to learn about how they work in the body.

For supporters who fought to achieve the legislative victory, **October 15, 2024**, represents a celebratory **30-year** anniversary of relative **health freedom**.^{7**}



Americans today enjoy access to low-cost, high-potency **vitamin D** supplements available from many reputable companies.

In countries that regulate supplements as “drugs,” health authorities have historically limited vitamin D potencies to only **400-800 IU** per day.

This is far less than what’s needed to achieve even modest *25-hydroxyvitamin D* blood levels.^{9,10}

A **2024** published review⁸ described:

- 1) Widespread vitamin D deficiencies,
- 2) The adverse impacts of these deficits,
- 3) Recommendations to increase the minimum daily **vitamin D** intake.⁸

This **2024** publication argues for a *higher* vitamin D supplementation dose than currently recommended by many health authorities.⁸

While modest by standards we pioneered decades ago, the authors of this review advocate for a vitamin D dose of **2000 IU (50 mcg)** per day as an efficient/safe approach to prevent and treat vitamin D deficiency in adult populations worldwide.

The authors recognize that the evidence underpinning recommendations for **2000 IU per day** is not (yet) well-recognized or established in the scientific literature or the currently published vitamin D guidelines.

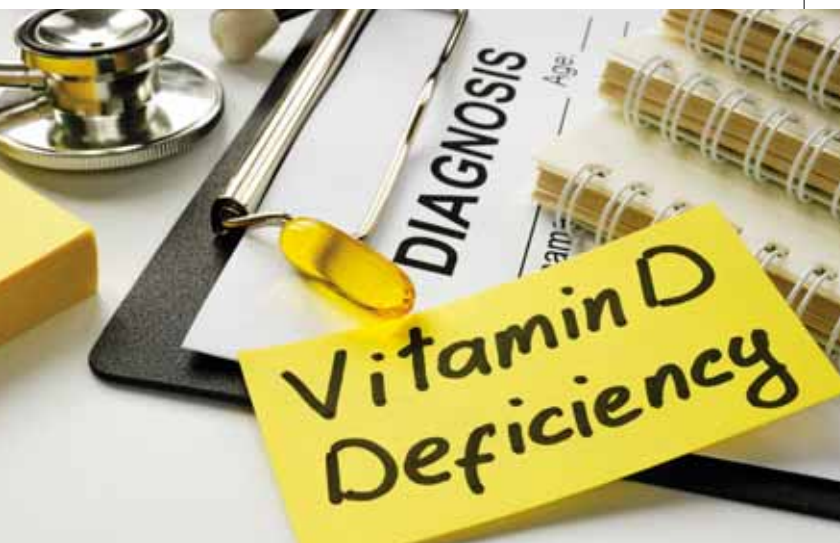
They nevertheless drafted their review with the aim that it may serve as a basis for consideration regarding future health-authority guidelines for **vitamin D**.

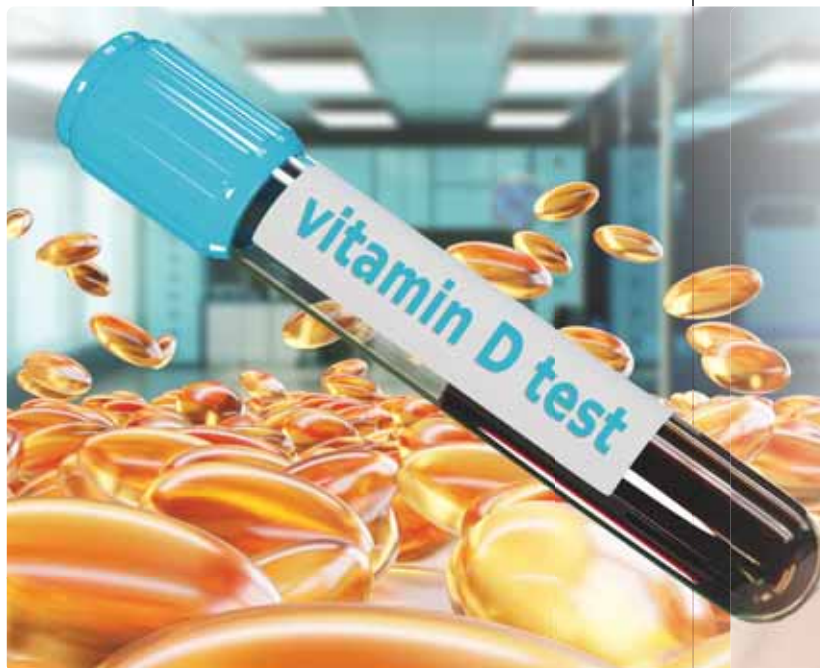
They emphasize worldwide prevalence of **25-hydroxyvitamin D** blood levels that are a frighteningly low **10-12 ng/mL** in **5% to 18%** of the population.

In **24% to 49%** of people worldwide, **25-hydroxyvitamin D** blood (serum) levels are below **20 ng/mL**.

Minimum adequate **25-hydroxyvitamin D** levels by conventional standards are at least **30 ng/mL**.¹² Many in the alternative fields advocate for ranges of **40-60 ng/mL** and higher.

The authors of the 2024 published review suggest that while individualized dosing to protect against vitamin D deficiency is the **optimal** approach, it is not practical or feasible in many at-risk populations.





Individualized approaches require baseline and follow-up **25-hydroxyvitamin D** blood tests, which most readers of *Life Extension Magazine*[®] do at modest cost. These tests are not feasible or affordable for most at-risk populations globally.

The authors of this **2024** review, therefore, argue that a universal daily **2000 IU** dose of **vitamin D** is reasonable.

They suggest adjusting doses according to individual needs, with characteristics such as low baseline **25-hydroxyvitamin D**, obesity, or malabsorption syndromes justifying the **2000 IU/day** dose.

Widespread Individual Variability

We at **Life Extension** have collectively reviewed tens of thousands of **25-hydroxyvitamin D** blood test results.

Some people are high *absorbers* and only need **2000-3000 IU** a day of supplemental **vitamin D** to achieve **25-hydroxyvitamin D** levels above **40-50 ng/mL**.

Many aging individuals, on the other hand, require **vitamin D** doses of around **7000 IU** a day to optimize their **25-hydroxyvitamin D** status.

I've observed when I temporarily discontinue taking a **5000 IU** daily vitamin D capsule and rely on a **2000-3000 IU** dose in multi-nutrient supplements, my **25-hydroxyvitamin D** levels decline faster than anticipated.

Easy Way to Boost Vitamin D Blood Levels

For those challenged to achieve the desired **25-hydroxyvitamin D** blood levels, in many cases all one needs to do is take their vitamin D supplement with a meal that contains some **fat**.

One study found **>50%** greater *absorption* of **vitamin D** when taken with a **fat-containing** meal compared to taking it on an empty stomach.¹⁴

Taking vitamin D with some fat enhances absorption and can reduce the potency/frequency of vitamin D capsules needed.

Vitamin D is **fat soluble** and can remain stored in a good range in the body for variable time periods after a high dose is lowered.¹³ I've reviewed hundreds of vitamin D blood test results and often find **25-hydroxy-vitamin D** levels do not always correlate to the dose of vitamin D ingested.

This is why **25-hydroxyvitamin D** blood tests are so important.

The next page describes a **CBC/Chem/Lipids Panel** with **25-hydroxyvitamin D** blood test that costs around **\$700** at commercial labs. This comprehensive panel is available with a **25-hydroxyvitamin D** blood test as a special offer for only **\$56**, through November 4, 2024.

Most of our readers perform **blood tests** frequently.

I want to make it easy for all of you to conveniently and affordably test your blood to optimize health parameters, including ensuring adequate **vitamin D** blood levels.

For longer life,



Bill Faloon, Co-Founder
Life Extension

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* *Examples of irresponsible use are taking high-dose stimulant supplements while engaging in excess physical exertion in hot climates. This can cause heat stroke. Even without excess physical activity/heat, high-dose stimulants can cause heartbeat irregularity, transient hypertension, and other health issues.*



VITAMINS BECOME LEGAL

Thirty years ago, Congress amended the **Food, Drug and Cosmetic Act** to enable qualified health information to be disseminated to the public.

In doing so, it prohibited the **FDA** from restricting the **First Amendment** protections of **free speech** and limited the FDA's authority to regulate dietary supplements. This resulted in the explosive growth of the industry.

Before **October 1994**, the FDA raided vitamin companies at gunpoint, seizing some dietary supplements and sometimes arresting the owners. Some companies were driven out of business.

** *The Dietary Supplement Health and Education Act (DSHEA), enacted in October 1994, had two primary goals: to ensure continued consumer access to a wide variety of dietary supplements, and to provide consumers with more information about the intended use of dietary supplements.*¹¹

SPECIAL BLOOD TEST OFFER!

VITAMIN D *plus* CBC/Chemistry and Lipid Panels

More than **70%** of Americans have insufficient blood levels of vitamin D, despite the ease and low cost of taking vitamin D supplements.¹

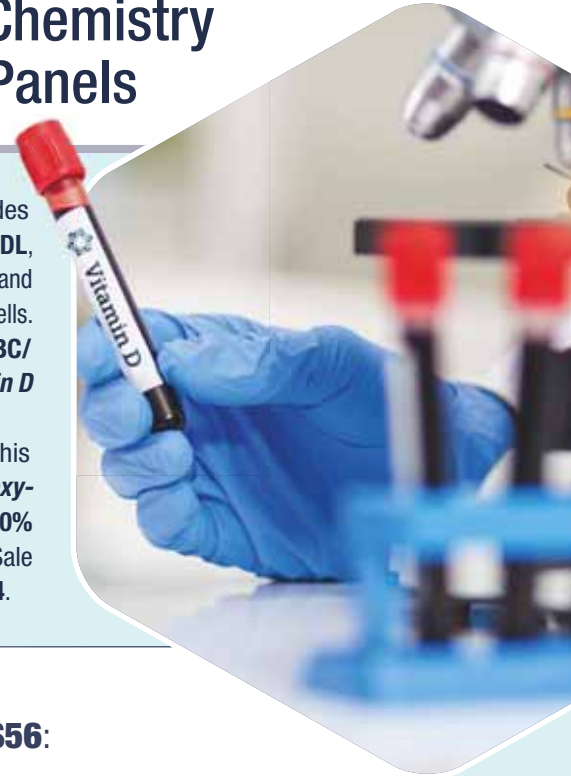
New research points to the importance of maintaining optimal vitamin D levels for **healthy immunity** and full-body health.

The **25-hydroxyvitamin D** test assesses your vitamin D status, enabling you to increase or decrease your dose based on how close you are to achieving **optimal** ranges.

The **CBC/Chem/Lipid Panel** includes measurements of **cholesterol, glucose, LDL, HDL, triglycerides, liver/kidney function**, and blood counts including important **immune cells**.

The regular member price for the **CBC/Chem/Lipid Panel** and **25-hydroxyvitamin D** tests when ordered separately is **\$82**.

For a limited time, we are offering this **CBC/Chem/Lipid Panel** plus the **25-hydroxyvitamin D** blood test for only **\$56**—over **30%** off the normal price of these two tests. Sale price effective through **November 4, 2024**.



Life Extension's **CBC/Chem/Lipid Panel** plus **25-hydroxyvitamin D** includes the following tests—for just **\$56**:

- Complete Blood Count:
 - Immune cell differential count
 - White blood cell count
 - Red blood cell count
 - Hemoglobin
 - Hematocrit
 - Red blood cell indices
 - Mean corpuscular hemoglobin
 - Mean corpuscular hemoglobin concentration
 - Red blood cell distribution
 - Platelet count
- Fasting Glucose (blood sugar)
- Uric acid
- BUN (blood urea nitrogen): Measures liver and kidney function
- Creatinine: A test used to measure kidney function
- BUN/Creatinine Ratio: For diagnosis of impaired renal function
- Estimated glomerular filtration rate (eGFR)
- Sodium
- Potassium
- Chloride
- Calcium
- Carbon Dioxide
- Phosphorus
- Total Protein
- Albumin
- Globulin
- Bilirubin: Evaluates kidney and liver function
- Alkaline Phosphatase: Evaluation of liver and bone diseases
- LDH (lactate dehydrogenase)
- AST (SGOT): Evaluates liver function
- ALT (SGPT): Evaluates liver function
- Iron (serum)
- Lipid Profile: Evaluates the risk for developing atherosclerosis (arterial plaque) and coronary heart disease.
 - Total Cholesterol
 - Triglycerides
 - HDL Cholesterol
 - LDL Cholesterol
 - VLDL
 - Total Cholesterol/HDL Ratio
 - Estimated CHD Risk



INCLUDES
**25-Hydroxy-
vitamin D**



To obtain this **special CBC/Chem/Lipid Panel + Vitamin D blood panel (LC381822COMBO)** at this **low price**, call **1-800-208-3444 (24 hours a day)** or visit **www.LifeExtension.com/labspecial** to order your requisition forms. Then – at your convenience – visit a blood-drawing facility in your area.

1. *Br J Nutr.* 2018 Apr;119(8):928-36.

Lab tests available in the continental United States and Anchorage, AK only. Restrictions apply in MA. Not available in MD.

Fisetin

The Healthy-Aging Flavonoid

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

Fisetin has low bioavailability 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 fisetin compound increased up to **25 times** compared to fisetin by itself.²



"I believe this product is another arrow in my quiver of products I use to be my best."

Raymond

VERIFIED CUSTOMER REVIEW

References

1. *EBioMedicine*. 2018 Oct;36:18-28.
2. Available at: <https://pubmed.ncbi.nlm.nih.gov/36304817/>

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

Item #02414
30 vegetarian capsules

1 bottle \$11.25
4 bottles \$10 each



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CELLULAR ENERGY



OPTIMIZED
NAD⁺
WITH
**RESVERATROL
ELITE™**

**NAD⁺ Cell Regenerator™
and Resveratrol Elite™**

Item #02348

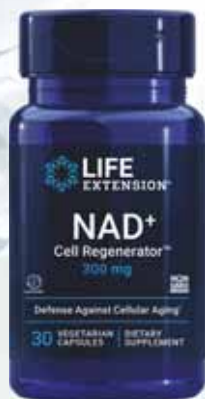
30 vegetarian capsules

1 bottle *

Resveratrol activates longevity proteins called **sirtuins**.

NAD⁺ enables cellular **sirtuins** to **function**.

Optimized NAD⁺ Cell Regenerator™ combines **300 mg** of **NIAGEN®** **nicotinamide riboside** with bioavailable **resveratrol** and **quercetin**.



NAD⁺ Cell Regenerator™

NAD⁺ Cell Regenerator™

Item #02344

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For those already taking resveratrol, we offer **NAD⁺ Cell Regenerator™** that provides **300 mg** of **NIAGEN®** **nicotinamide riboside**.



* For pricing available to readers of this magazine,
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For full product description and to order **NAD⁺ Cell Regenerator™** or **NAD⁺ Cell Regenerator™ and Resveratrol Elite™**, call **1-800-544-4440** or visit www.LifeExtension.com

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

NAD⁺ Cell Regenerator™ has met ConsumerLab.com standards for ingredient and product quality for Nicotinamide Riboside in independent testing. More information at www.consumerlab.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.

We Are Recruiting Study Participants in Person and Online!



Participate in a clinical research study at our Fort Lauderdale location or visit LifeExtension.com/AtHomeStudy.

Who We Are

Life Extension Clinical Research, Inc. is a dedicated research arm of Life Extension. Our research efforts are primarily focused on understanding the potential benefits of innovative dietary supplements and healthy lifestyle regimens on longevity, healthspan and quality of life.

We also offer Contract Research Organization (CRO) services, helping others develop and implement their own clinical trials—from subject recruitment to project management.



How to Participate

You can participate in the research process and be the first to potentially benefit from innovative new dietary supplement formulations and health-promoting interventions. Help people live a healthier life by being part of a clinical research study either at Life Extension's Ft. Lauderdale, FL location or virtually from the comfort of your own home.

Our Published Studies

Inflammation and Discomfort: This virtually conducted study on inflammation and discomfort found that a PRM-enriched marine oil/ bioavailable curcumin combo significantly reduced pain severity, intensity, and total pain scores over the course of 60 days.

Men's Bladder Clinical Study: Focusing on the quality-of-life effects of nighttime urinary frequency, this study showed promise for men seeking non-pharmaceutical therapies for frequent, sleep-disrupting nighttime urination.

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You can also email LEClinicalResearch@LifeExtension.com
or call 1-866-517-4536

In the News



Antioxidants Improve Short-Term Mortality Risk in Sepsis Patients

Findings from a systematic review and meta-analysis revealed that the administration of antioxidants was associated with improved short-term survival among men and women with sepsis, a complication of infection that results in body-wide inflammation.*

A total of 60 studies were analyzed, which included 130,986 sepsis patients. There were 35 randomized controlled trials and 25 non-randomized controlled studies.

An analysis of all studies that examined in-hospital mortality and 28-day mortality found a **19% reduction** among patients who received antioxidant therapy in comparison with the odds of in-hospital mortality of those receiving standard care.

When separate therapies were analyzed, **vitamin B1** and **vitamin C** were associated with respective **36%** and **34% lower** odds of in-hospital mortality compared to the odds of mortality in those receiving standard care.

When separate therapies were analyzed, **vitamin C** treatment was associated with **34% lower** odds of in-hospital mortality and **57% reduction** in 28-day mortality compared to the odds of mortality in those receiving standard care.

Editor's Note: An analysis of only the randomized controlled trials found that the odds of short-term mortality were **43% lower** among the **vitamin C** group compared to the odds of mortality in the group receiving standard care.

* *Heliyon*. 2024 Apr 4;10(8):e29156.

Melatonin and Age-Related Macular Degeneration

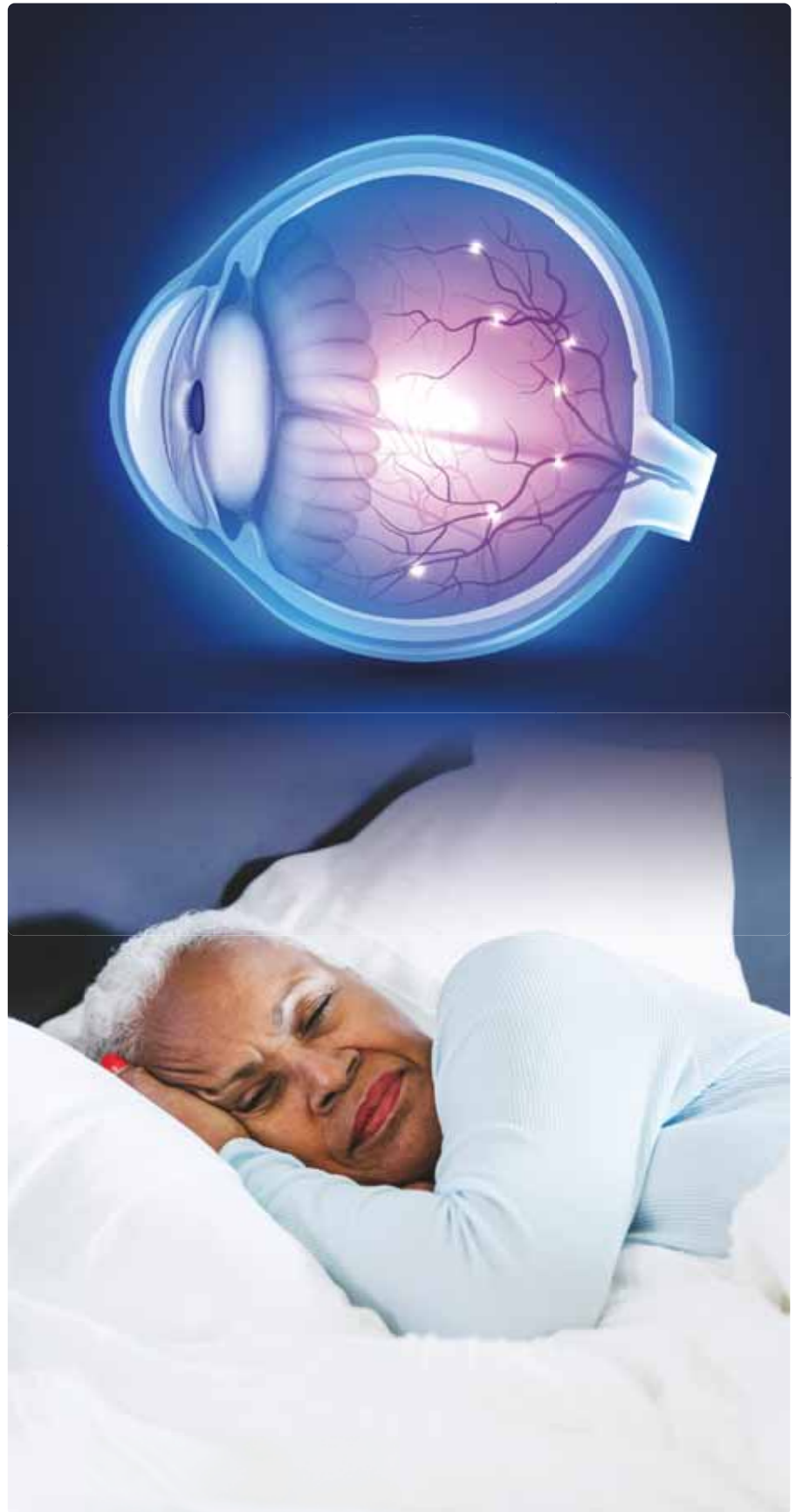
Adults who used the sleep hormone melatonin had a significantly lower risk of developing age-related macular degeneration (AMD) and had less disease progression according to a retrospective study.*

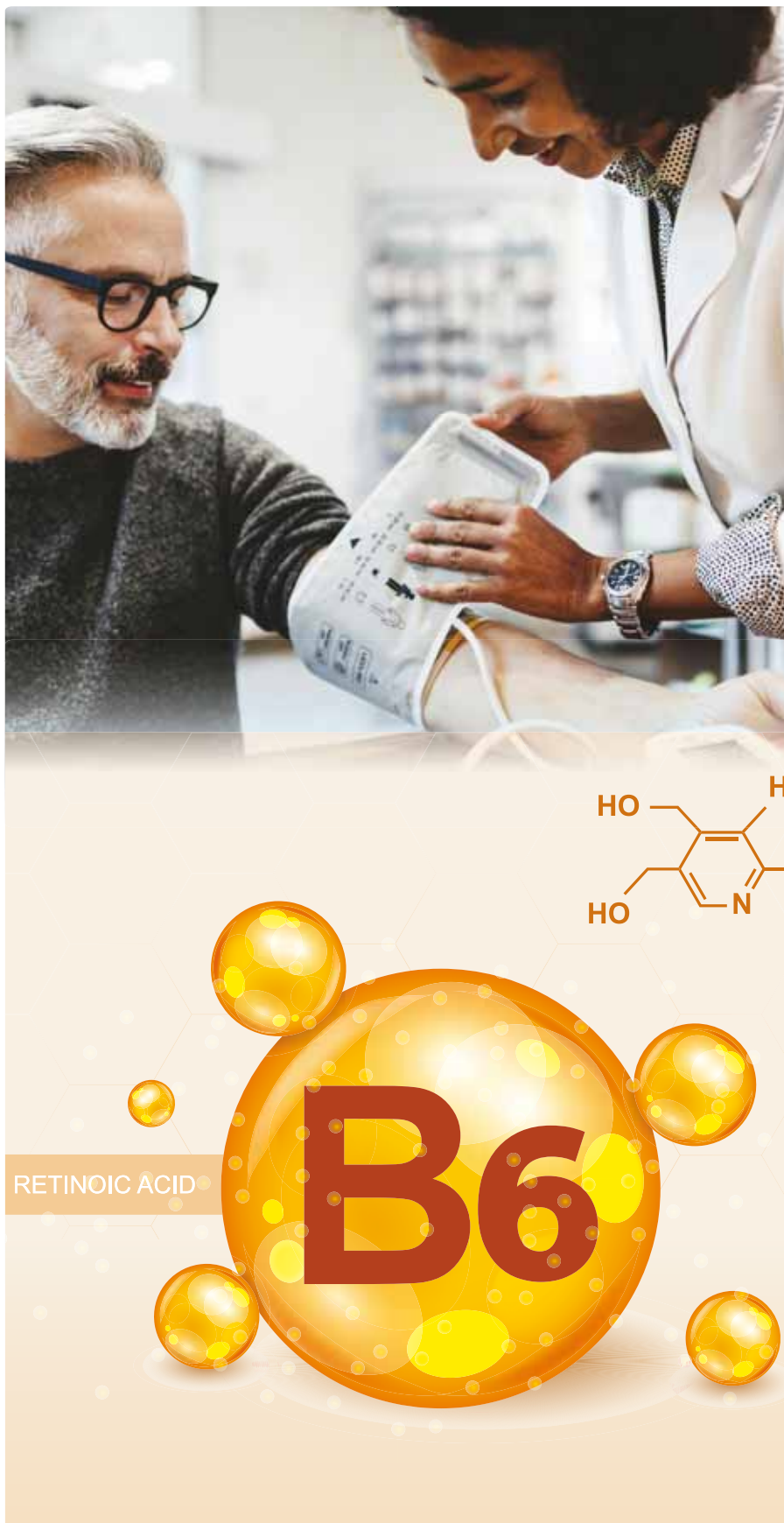
Researchers analyzed information from the health records of 121,523 men and women aged 50 or older who had at least one record of receiving an eye examination or being screened for eye disorders that did not reveal wet AMD beginning in November 2008 to November 2023. Individuals who reported melatonin use on four or more occasions at least three months apart were categorized as melatonin users.

Among subjects who did not initially have AMD, those who used melatonin had a **58% lower** risk of developing the disease through 2023 compared to the risk of those who did not use melatonin. For people who had dry AMD, the risk of progressing to wet AMD was **56% less** among melatonin users compared to the risk of nonusers.

Editor's Note: When people aged 60 and older were examined, melatonin use was associated with a **64%** lower risk of developing AMD and a **62%** lower risk of progression from dry to wet AMD.

* *JAMA Ophthalmol.* 2024 Jun 6.





Lower Odds of Stroke with Higher Vitamin B6 Intake

A study including 24,214 men and women found lower odds of stroke among those who consumed higher amounts of vitamin B6.*

Researchers analyzed data collected between 2005–2018 from participants in the National Health and Nutrition Examination Survey (NHANES). It included 921 people who had been diagnosed with stroke and 23,293 with no stroke history. Vitamin B6 intake was determined from responses to two dietary recall interviews.

People whose vitamin B6 intake was among the top **25%** of the study's subjects had **52%** lower odds of stroke in comparison with individuals whose intake was among the lowest **25%**. The authors observed that B vitamins lower levels of the amino acid homocysteine. Higher levels of homocysteine are associated with an increased risk of stroke.

Editor's Note: Vitamin B6 also helps support a healthy inflammatory response by inhibiting the activation of nuclear factor kappa-B, interleukin-6 and tumor necrosis factor-alpha.

* *Heliyon*. 2024 May 11;10(10):e31125.

Alpha-Lipoic Acid Shows Benefits for Polycystic Ovary Syndrome

A retrospective study revealed improvements in insulin sensitivity and liver enzymes among overweight or obese women with polycystic ovary syndrome (PCOS) who received alpha-lipoic acid (ALA) daily for 12 weeks.*

PCOS is a condition caused by elevated levels of hormones known as androgens. The condition is characterized by ovarian cysts, weight gain, difficulty becoming pregnant and other signs. Women with PCOS may have elevated levels of insulin and/or a family history of diabetes.

The study included 32 women with PCOS who received **400 mg** daily of ALA. Routine examinations and blood tests for hormones, insulin, glucose tolerance, liver enzymes and other factors were conducted at the beginning and end of the study.

At the end of the treatment period, participants had significant improvement in insulin sensitivity and reduced levels of the liver enzymes ALT and AST without changes in reproductive hormones. After three months plasma insulin levels decreased together with an index (HOMA) of **insulin resistance**.

Editor's Note: The authors noted that the combination of high insulin levels and elevated ALT and AST has been considered a trigger for nonalcoholic fatty liver disease, which occurs at a higher rate among women with PCOS than in those who do not have the condition.

* *Gynecol Endocrinol.* 2024 Dec;40(1): 2341701.





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

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

VITAMIN D + VITAMIN K + SEA IODINE = Convenience + Cost Savings



Just one capsule daily provides:

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

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

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4 bottles \$16.50 each



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

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"Good stuff!"
Steven
VERIFIED CUSTOMER
REVIEW

A

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People tend to live longer in areas where lithium is abundant in the drinking water.*

Lithium is a low-cost mineral that functions in several ways to support cognition and overall brain health.

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(1,000 mcg of lithium per tiny cap)

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100 vegetarian capsules

1 bottle **\$12**
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Each bottle lasts 100 days.

*European Journal of Nutrition. 2011;50(5):387-389.

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"It is my goal to never run out of this. Ever!"

Rusty

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SUPPORTS OVERALL
COGNITIVE ABILITY

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References: 1. *Neuropharmacology*. 2016 2016/09/01/;108:426-39. 2. *Journal of Cellular Physiology*. 2016;231(9):1903-12. 3. *J Alzheimers Dis*. 2016;49(4):971-90.

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Help Your
HEART
PUMP
BETTER



BY MICHAEL DOWNEY

Over time, our **heart** muscles *weaken*.

Age-related degenerative changes are often major culprits.¹

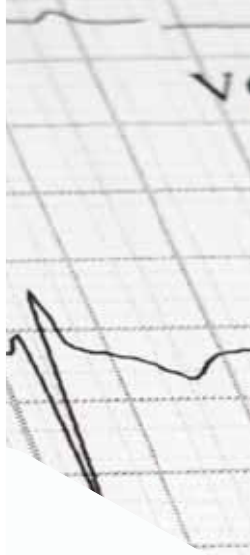
These changes may result in *reduced* efficiency of the heart to pump blood, which *reduces* the amount of oxygen that is pumped to the rest of our body. This often becomes symptomatic during periods of exertion or stress.¹⁻³

Weaker pumping of the left ventricle over time may result in debilitating **cardiovascular disease** and even **cardiac failure**.⁴

For centuries, the **arjuna** plant has been used in Indian Ayurvedic medicine to treat heart disorders and other diseases.⁵

Modern research has found that **arjuna** supports **cardiac function** by strengthening the heart muscle's "squeeze," increasing the volume of blood it can pump with each heartbeat.^{6,7}

Clinical trials show that a specific **arjuna bark extract** boosts the left ventricle's pumping output, supporting cardiac endurance and decreasing **physical fatigue** by a clinically significant average of **23%**.^{6,7}



ARJUNA BARK



Measuring Cardiac Pumping Power

The **ejection fraction** test measures how effectively one's heart pumps blood during each heartbeat.

Testing **left ventricular ejection fraction** enables doctors to assess how effectively one's heart pumps blood out of the left ventricle. The **left ventricle** is the heart chamber that directly pushes oxygen-rich blood to the rest of the body.⁸

In a healthy heart, the **left ventricular ejection fraction** is usually **50% to 70%**.⁸ A lower number indicates the heart is having trouble keeping up with your body's needs, especially under exertion. A left ventricular ejection fraction **below 50%** can indicate left-sided heart dysfunction.⁸

Left ventricular ejection fraction generally declines with **age**, though healthy eating, exercise, and reducing stress can help inhibit this decline.^{3,4,9}

In recent years, an extract of the **arjuna tree** has been clinically shown to increase left ventricular **ejection fraction** and improve cardiac output.

What Your Left Ventricular Ejection Fraction Means

Ejection fraction refers to the percentage of blood that is pumped out of the ventricles with each heartbeat.

It is a key measure used to assess how well the heart is functioning, particularly the left ventricle.

A physician can help interpret the implications of your **left ventricular ejection fraction**, or **LVEF**, number. But here is a general guideline:¹⁴

- LVEF **above 70%** - Hyperdynamic (a possible sign of a heart condition)
- LVEF **50% to 70%** - Normal
- LVEF **40% to 49%** - Mild dysfunction
- LVEF **30% to 39%** - Moderate dysfunction
- LVEF **below 30%** - Severe dysfunction

* LVEF **below 30%** may indicate heart failure.

Arjuna Bark

Parts of the **arjuna** tree, which grows widely on the Indian subcontinent, have long been studied for medicinal properties.

In pre-clinical studies, **bioactive** compounds found in **arjuna** were shown to be:¹⁰

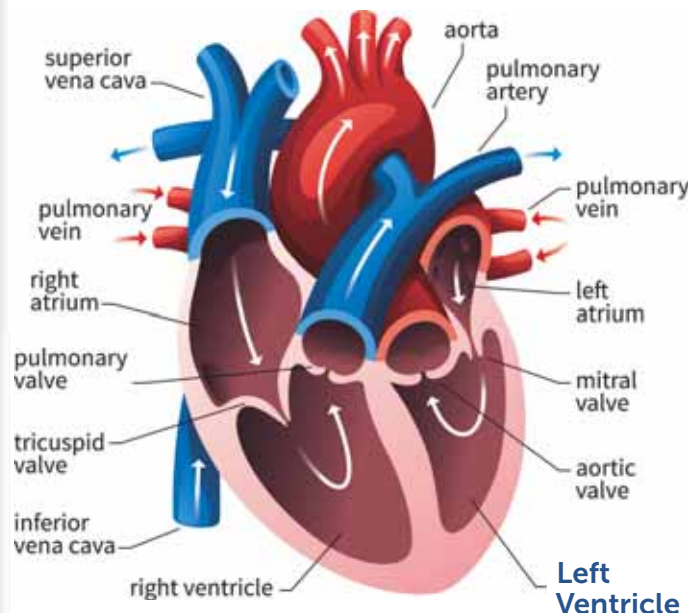
- Anti-inflammatory,
- Antioxidative,
- Anti-atherosclerotic,
- Cardioprotective, and
- Anti-tumor.

Compared to the fruit, seed, leaf, and root of the tree, **arjuna bark** has a substantially *higher* concentration of **flavonols** (quercetin, myricetin, and kaempferol), **flavanole** (catechin), and **phenolic acids** (gallic acid, p-coumaric acid, and ferulic acid).¹⁰

These compounds appear to have the ability to *increase* the force of the heart's muscular contractions.^{6,7} This improves pumping, increases **cardiac output**, and reduces physical **fatigue**.^{6,7}

Two randomized, controlled clinical studies have confirmed these benefits in an **arjuna bark** extract standardized to provide **30% polyphenols** and **15% glycosides**.^{6,7}

Anatomy of the Human Heart





Better Pumping, Less Fatigue

In one study, researchers enlisted 72 male and female volunteers between the ages of 30–70 years, sedentary, and overweight. They had left ventricular **ejection fraction** ratios (assessed using a type of echocardiogram) ranging from **48% to 60%**,⁶ which are mildly reduced to normal.

One group took **400 mg of arjuna extract** daily for eight weeks, while another took a **placebo**. Both groups maintained normal dietary and exercise regimens.⁶

Those who took the arjuna *increased* their left ventricular **ejection fraction** by a clinically significant **3.6 percentage points**, improving their cardiac endurance.⁶

Research shows that even modest changes in left ventricular ejection fraction may be clinically important in determining the risk of future **mortality**.^{11,12}

Physical fatigue levels were also evaluated, using a standard questionnaire that measures fatigue severity and how it affects activities and lifestyle.

Those who took the **arjuna extract** reported clinically significant improvement in fatigue scores¹³ with an average of **23% improvement**, compared to less than **10%** in the **placebo** group.⁶

Arjuna extract provided a **decrease** in fatigue's interference in:⁶

- Physical functioning,
- Sustained physical functioning, and
- Performance of duties and responsibilities.

WHAT
YOU
NEED
TO
KNOW

Support Healthy Heart Function

- With age, the heart's **left ventricle** loses its ability to effectively pump oxygen-rich blood to the body. Over time this may lead to cardiovascular disease/cardiac failure.
- A standardized extract of **arjuna** tree bark has been shown to increase the **left ventricular ejection fraction**, a measure of how much blood the heart can pump out of the left ventricle with each heartbeat.
- In a clinical study, **arjuna extract** increased left ventricular ejection fraction by a clinically meaningful **3.6%** in participants in the mildly reduced to normal ranges. Their fatigue scores decreased by a clinically significant **23%**.
- A similar improvement in **left ventricular ejection fraction** was demonstrated in a clinical trial of active young men with LVEF numbers well into the healthy range, showing that **arjuna** improved cardiac output in a wide range of subjects.

Effects in Healthy Adults

Scientists also tested **arjuna** extract's effect on the heart's pumping capability in **active** adults with a **healthy** left ventricular ejection fraction.

Researchers enlisted 31 healthy, endurance-exercising men, aged **18-40** years. Their left ventricular ejection fraction scores ranged from **55%** to **70%**.⁷

All volunteers' left ventricular ejection fraction and fatigue levels were assessed after physical exertion on a treadmill.

After eight weeks, participants who took the **arjuna extract** had improved their *already* healthy left ventricular **ejection fraction** by a clinically significant **3.7** percentage points.⁷

This shows that this extract may benefit individuals whether their left ventricular ejection fraction is mildly **reduced** or **healthy**.

Researchers also used a scale measuring subjects' perceived exertion to assess physical fatigue. Those taking arjuna had statistically significant *increase* in **time-to-exhaustion** score, and their perceived level of **exertion** was significantly *reduced*.⁷

No serious adverse events were reported in either study.^{6,7}

Arjuna extract can help maintain a strong, healthy heart and decrease physical fatigue by increasing cardiac output.

Research suggests that **arjuna** extract may have potential to improve **ejection fraction** in patients with **heart failure**.^{6,7} While preliminary studies are promising, more extensive clinical trials are needed to confirm these effects in heart failure patients who must rely on cocktails of drugs and nutrients to maintain barely sufficient cardiac output.

Summary

Over time, the heart's **left ventricle** tends to pump less oxygen-rich blood to your body.

This can eventually lead to **cardiovascular disease/ cardiac failure**.

Clinical studies show that **arjuna bark** extract increases the **left ventricular ejection fraction**, a measure of the amount of blood the heart can pump out of the left ventricle with each heartbeat.

This ability to support healthy heart function was seen in individuals with mildly **reduced** and **healthy** left ventricular ejection fractions. Both groups also had a significant decrease in **fatigue** levels. ●



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

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Transcatheter aortic valve implant

Aortic Stenosis and Transcatheter Aortic Valve Replacement (TAVR)

Aortic stenosis is a common disorder seen in adults 65 years and older. It involves scarring and calcification of the **aortic valve**.¹⁵

When working normally, the **aortic valve** helps ensure that blood flows in only one direction, blocking backward flow into the heart's left ventricle.¹⁶

But with age, heart valves can become diseased. The pathology reflects cardiac valve dysfunction, where calcium and scar tissue build-up impedes valve functionality, such as in **aortic valve stenosis**, which can also be genetic in origin.¹⁵ This makes the valve stiff and difficult to open.

Stenosis of the aortic valve puts a large stress on the heart and impairs its ability to function. Because the main output pathway from the heart is partially blocked, the heart muscles must work harder to get adequate blood supply to the entire body.¹⁵

Over time, as aortic stenosis worsens, it can significantly impair the **cardiac output**, becoming symptomatic. Symptoms such as shortness of breath, chest pain, and fainting can occur with physical exertion. As the stenosis gets worse, the heart can eventually fail to generate enough blood flow and **heart failure** develops.

Traditionally, the only option to correct aortic stenosis has been open heart surgery to replace the valve.¹⁵ Although this procedure can reverse aortic stenosis and take stress off the heart, it cannot be tolerated by all patients, especially the elderly.

Open heart surgery typically has long hospitalization and recovery times. Patients with severe disease or other age-related conditions may be poor candidates for open heart surgery. The stress of these procedures and long anesthesia times increase the risk of complications and poor outcomes.

Fortunately for people suffering from aortic stenosis, there is now another option.

Transcatheter aortic valve replacement (TAVR) is an alternative treatment in many cases. It is an effective and less invasive endovascular procedure—meaning that it does not require the chest to be opened and it is done almost entirely through catheters in the blood vessels with x-ray guidance.¹⁷

The advantages of this technology are that it is much less traumatic than open heart surgery and the resulting hospitalization and recovery times are significantly reduced compared to open heart surgery.

TAVR may not be indicated for all patients, depending on various details of their condition and general health. Furthermore, while generally less traumatic than open heart surgery, **TAVR** is not without its own risks. As with surgical valve replacement, complications such as bleeding, stroke, and others can occur in some cases, as well as death.

However, a recent trial that randomized patients with aortic stenosis to **TAVR** versus surgery found that outcomes were largely comparable. Most notably, the occurrence of poor outcomes (death, stroke, rehospitalization related to the procedure, and heart failure) was not significantly different between the two options.¹⁸ Therefore, this **TAVR** may be an option for a growing subset of patients suffering from symptomatic **aortic stenosis** who wish to avoid surgery or for whom open heart surgery is too risky.



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

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

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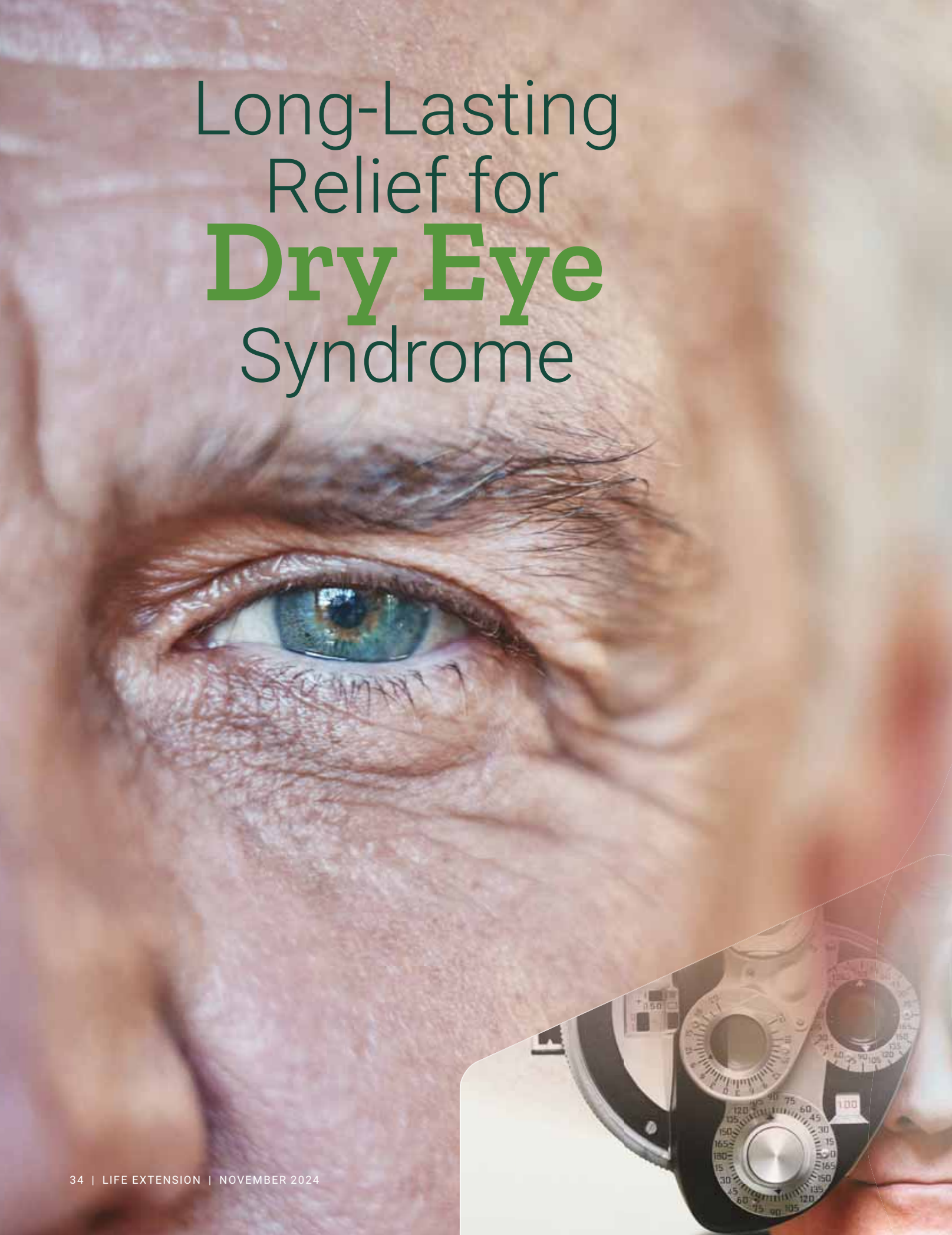
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2. *Am J Ther.* 2017 May;24(3): e298-e307.

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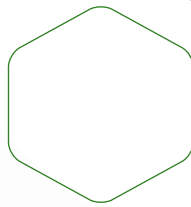
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Long-Lasting Relief for **Dry Eye** Syndrome





MAQUI BERRY



BY MICHAEL DOWNEY

Dry eye syndrome is an annoyance, causing redness, itching, and other frustrating symptoms.

This condition occurs when the eyes don't produce enough **quality tears**.²

When **dry eye syndrome** becomes severe, and is left untreated, it can lead to permanent **eye damage**.¹

Prevalence of dry eye syndrome is growing with greater use of smartphones, tablets, computers, and other **digital screens**.³

It has been estimated to affect about **16 million** Americans.⁴

Many turn to over-the-counter eye drops, which provide **short-term** relief but don't address underlying causes.

Prescription treatments are available but can have side effects and may provide only symptomatic relief.⁵

Here's the good news: Scientists have identified a **berry extract** that combats dry eyes the natural way, by boosting the body's *own* production of **real tears**.⁶

A pilot study found that, taken **orally**, a **maqui berry** extract provided a **72%** improvement in **dry eye** symptoms after 60 days.⁶

A larger **clinical trial** showed that **maqui** extract, taken orally for four weeks increased **tear production** by **89%**, protecting the eyes and improving quality of life.⁷



Possible Eye Damage

Dry eye syndrome can be caused by aging, wearing contact lenses, dry weather, air pollution, smoking, and allergies.⁵ It can also be associated with some medical conditions or can even occur after eye surgery.^{4,5} Use of computers, smartphones, tablets, e-readers, and other **digital screens** often worsens the condition.^{8,9}

The symptoms of dry eyes can include itching, burning, light sensitivity, and blurred vision.⁴ The discomfort and visual disturbances from dry eyes can impact **quality of life**.¹⁰ Studies have shown that the irritation of dry eyes is associated with lower scores on mental health scales,^{10,11} including depression and anxiety.¹²

Even worse, without treatment, chronic dry eyes can cause **eye damage**.^{1,4}

Tears are essential for lubricating and protecting the **cornea**, the front central surface of the eye. They protect the eye from infection, wash away foreign matter, and deliver critical nutrients to the surface.^{13,14}

As a result, dry eyes can eventually damage the **cornea**. If severe and left untreated, ulceration and scarring of the cornea can lead to permanent **impairment of vision**.⁵



Tear Quantity and Quality Matter

There are **three layers** of natural tears: oil, water, and mucus.¹⁵

The eye surface is lubricated, nourished, and protected by the normal, if tiny, amount of **tears** normally produced daily, about **0.7 mL** to over **3 mL** per eye.⁶

People affected by **dry eye syndrome** either:⁵

- Don't produce enough tears, or
- Have tears that evaporate too quickly.

Maqui Berry Restores Tears

Seeking a solution, scientists identified **maqui berries**, a fruit found in Chile, abundant in anthocyanidin pigments called **delphinidins**. Maqui berries and delphinidins exhibit protective effects to support eye and vision health.^{6,16}

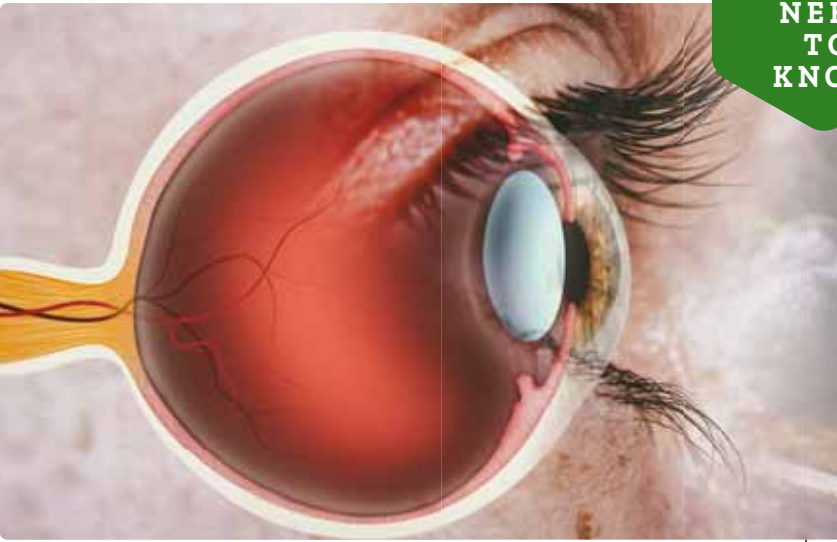
Researchers have found in preclinical studies that a standardized **extract** of **delphinidin-rich maqui berries** may:^{16,17}

- Provide protection to the eye and tear producing lacrimal gland by reducing levels of free radicals,¹⁶
- Inhibit harm from light exposure, protecting critical **photoreceptor cells** that convert light into signals sent to the brain,¹⁷ and
- Help restore production of natural, high-quality tears.¹⁶

Taken orally, an extract of maqui berries has been shown to **boost natural tear production**, delivering relief for dry and irritated eyes.^{6,7} This, in turn, may help prevent the damage that can occur with long term, unmanaged dry eyes.

This eye benefit of **maqui berry** extract was seen in a rat model of dry eyes. The rats were randomized to receive pretreatment with **maqui berry** extract and with **placebo**.

Pretreatment with maqui berry extract significantly prevented loss of tears as compared to placebo. The animals pretreated with **maqui berry extract** retained clear eyes with no new corneal damage throughout the study.¹⁶

WHAT
YOU
NEED
TO
KNOW

Boost Natural Tears and Soothe Dry Eyes

- **Dry eye syndrome** is increasingly common, causing burning, redness, itching, eye fatigue, and reduced quality of life. When severe, prolonged, and untreated, it can also lead to permanent eye damage.
- Eye drops only have a temporary effect, and prescription medications can have side effects.
- Taken orally, an extract of the **maqui berry** has been clinically shown to boost **high-quality** tear production by **89%**, improving dry eye symptoms, quality of life, and eye health.

Compelling Pilot Study

In a pilot **clinical trial**, researchers investigated the ability of **maqui berry extract** to relieve dry eyes by supporting healthy tear production. The study enrolled 13 adults with moderate eye dryness, which was tested by Schirmer's test to evaluate the amount of tear fluid produced by the tear glands.⁶

The 13 volunteers took either **30 mg** or **60 mg** of **maqui berry extract** daily for 60 days.

Both dosages led to about **50%** improved **tear production** after 30 days. After 60 days, however, the *lower-dose* group lost half of their improvement, while the *higher-dose* group maintained **nearly all** their increased tear production.⁶

The participants were also evaluated to assess bothersome symptoms of dry eyes and their effect on daily life. This was done using a **Dry-Eye Related Quality-of-Life Score test** questionnaire. A *higher* score indicates *greater* impairment and *worse* quality of life.

The score for each group was about **40** at the start of the study. After taking daily **maqui berry extract**:⁶

- Scores for patients taking **30 mg** of maqui berry extract improved to almost **22** after 30 days. But their scores stayed much the same by day 60.
- Scores for patients taking **60 mg** improved to almost **27** after 30 days. But their scores continued to drop to a beneficial low **11** points by day 60.

This constitutes a **72% improvement** in dry eye-related quality-of-life symptoms after just two months.⁶

Clinically Validated

Moving on to the gold standard of medical research, scientists conducted a **randomized, placebo-controlled trial**.

This study enrolled 74 healthy adults with moderate eye dryness and eye fatigue and more than four hours of exposure to computer, cell phone or other screen-based devices. Each day, half took a placebo, and half took **60 mg** of **maqui berry extract** for four weeks.⁷

At the start, dryness levels were the same for each group. But after four weeks, the **maqui extract** group had:⁷

- Higher production of **tear fluid** in both eyes, with an average increase of **89%**,
- Reduced **eye dryness**, and
- Less **eye fatigue**.

On a quality-of-life test, the maqui group had substantially *improved* total values for bothersome **ocular symptoms** (such as grittiness, dryness, or redness), compared to the placebo.

On another survey, the **Visual Analog Scale**, the maqui group reported significant improvements in **eye fatigue**.⁷

This clinical trial found that taking **60 mg of maqui berry extract** daily for four weeks reduces eye dryness and fatigue, which may help protect eyes from permanent damage.

Summary

Dry eye syndrome causes discomfort and reduced quality of life and can lead to long-term damage to eye tissue.

An oral extract of the **maqui berry** helps the body produce more of its *own* high-quality tears.

It has been shown in clinical research to boost natural tear production by **89%**, improving dry eye symptoms, protecting eye health, and boosting quality of life. •



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

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FOR HEART HEALTH



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This produces a high content of s-allyl-cysteine, a phytochemical associated with **cardiovascular** health.¹⁻⁴

Clinical research has shown that **aged black garlic** provides targeted support for healthy serum triglycerides, blood pressure, and cholesterol within normal range.⁴



Item #02530

30 500 mg vegetarian capsules

1 bottle **\$18**

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For full product description and to order **Aged Black Garlic Odorless Extract**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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Cry me a river

Tears are a good thing—until you don't have enough.



Item #01918

30 vegetarian capsules

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4 bottles \$12 each

"Love this!"

Michael

VERIFIED CUSTOMER
REVIEW

You might think tears are produced only when you're happy or sad. But your body constantly makes them. Tears lubricate and protect your eyes.

Maqui berries produce compounds called delphinidins that encourage tear production—an up to **45% increase** in one study.

So where can you get a delphinidin-rich maqui extract? **Tear Support with MaquiBright®**.

For full product description and to order **Tear Support with MaquiBright®** call **1-800-544-4440** or visit **www.LifeExtension.com**

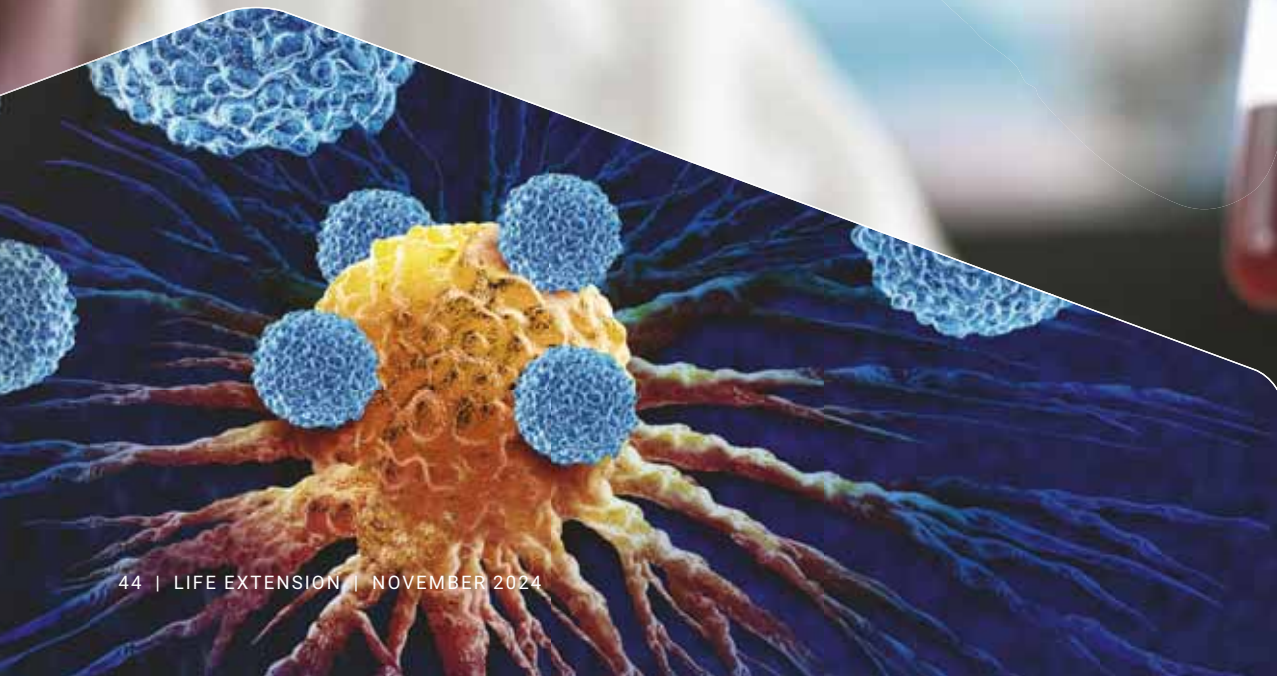


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MELATONIN: Potential Anti-Cancer Effects





BY RANDALL THOMPSON

The hormone **melatonin** has long been used to help improve sleep.¹

But its effects go much further.

Scientists have found that taking **oral melatonin** may influence many physiological processes that could potentially provide **anti-cancer** benefits.²⁻⁵

Oral melatonin has been shown in clinical studies to reduce side effect severity when taken along with conventional cancer treatments.^{2,5-7}

Even more impressively, in multiple studies of **cancer** patients, adding melatonin to standard treatment improved **tumor regression** and **survival** rates.

Too Much Light!

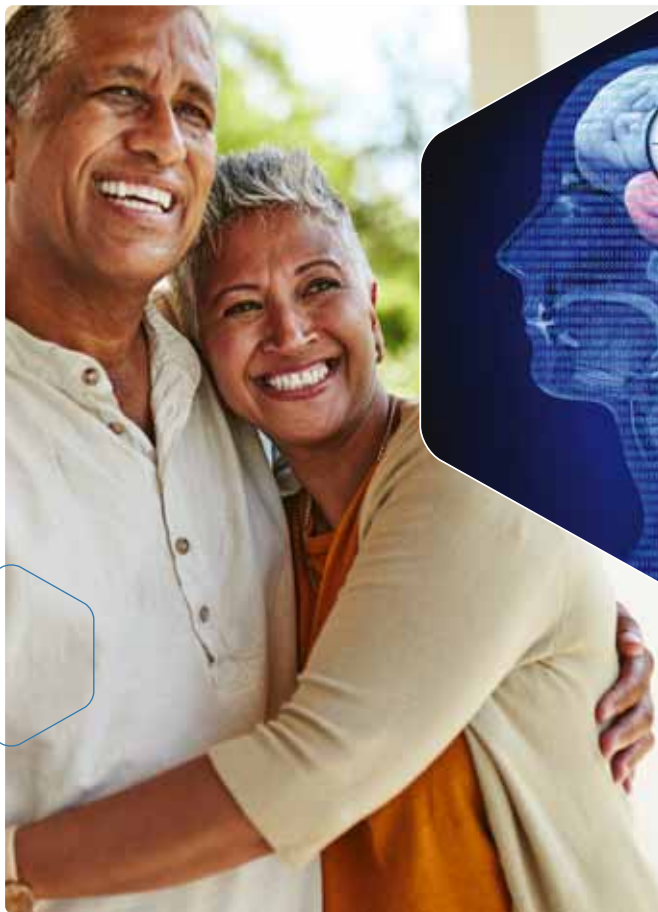
When we are exposed to regular light and dark cycles, our bodies produce and release the hormone **melatonin** mostly at night in the dark.^{2,4}

Melatonin helps induce and control **sleep**. But it determines much more than just sleep/wake cycles: It affects hormone levels, immune function, inflammation, reproduction, and cell protection^{4,8} One of its important roles is DNA protection and repair.^{3,9}

These days, many people get too much **artificial light** exposure in the evenings, whether from overnight work shifts, late night television watching, or staying up looking at phones, tablets, or computer screens.

This *disrupts* the natural light and dark cycle and can cause **melatonin** levels to plunge.¹⁰ To make matters worse, melatonin secretion also tends to diminish with **older age**.¹¹

Disruption of this natural cycle and of melatonin secretion has negative effects throughout the body. Research has shown that taking **oral melatonin** at night may help mitigate these problems, aiding sleep and activating the hormone's other vital functions.



Anti-Cancer Actions

Preclinical data have shown that melatonin can regulate different physiological pathways in the body that can help protect against **cancer**. These include inhibition of **tumor cell growth**, promotion of **immune cell response**, and enhanced **apoptosis** (normal cell death).¹²

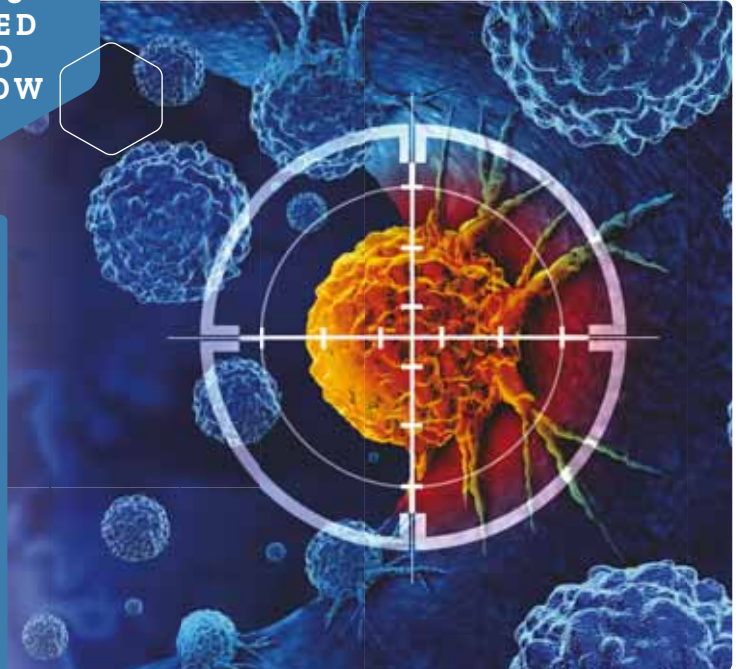
Three pathways involved in these effects include:

- 1. Signaling Pathways.** In preclinical studies melatonin has been shown to inhibit malignant transformation of healthy cells by downregulating growth factors, suppressing tumor progression, and initiating apoptosis.² Studies on breast cancer cells and animals have reported melatonin combined with chemotherapy treatment showed improved **apoptotic** effects compared to melatonin alone.⁸

- 2. Supporting healthy immune function.** Preclinical studies have shown that melatonin plays an instrumental role in modulating immunity, which suggests

potential as an adjuvant against certain viral and bacterial infections.¹³⁻¹⁵ Modulation of immune response has potential to enhance the effectiveness of anti-tumor therapy and ease normal tissue toxicity.¹⁶ This immune-modulating property of melatonin may also help the immune system identify and target cancerous and precancerous cells, meaning it might be able to impede the growth of cancerous cells and reduce tumor size.^{8,16}

- 3. Oxidative stress.** Oxidative stress can cause DNA damage, increasing the risk of cancer. The antioxidant activity of melatonin is a protective mechanism that might reduce cancer risk and progression.^{2,9}

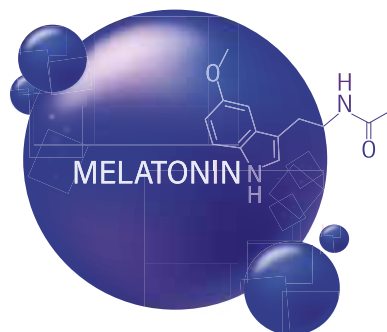
WHAT
YOU
NEED
TO
KNOW

Help Fighting Cancer

- Best known for helping to promote quality sleep, the hormone melatonin has wide-ranging effects on cells throughout the body. In preclinical settings it has also shown **anti-cancer** activity.
- In observational studies, lower levels of urinary melatonin metabolites are linked with higher risks of some **cancers**.
- Human trials have shown that taking oral melatonin, alone or with other treatments, has improved outcomes for cancer patients, increasing **survival rates** and **tumor regression**.
- Melatonin may also ease and protect against many harmful **side effects** of chemotherapy and radiation.

Through these and other actions, melatonin has been shown to have **anti-cancer** effects on cancer cell lines, including:

- Prostate,^{8,17}
- Breast,^{8,17}
- Stomach,^{2,17}
- Lung,^{5,18}
- Ovarian,^{5,8}
- Colorectal,^{5,17}
- Oral,^{2,5}
- Liver,^{8,12} and
- Kidney.⁵



Improving Response to Human Standard Treatment

Observational studies have shown that exposure to light at night is associated with increased risk of breast cancer. And suppression of melatonin is believed to play an important role in this association.¹⁹⁻²¹

Human studies have reported that lower levels of urinary melatonin metabolites are associated with increased risk of advanced prostate²² and breast cancer.²³

One study evaluated women with estrogen receptor negative ER (-) **metastatic breast cancer**. These women had late-stage advanced disease and could not tolerate further chemotherapy (due to age, low performance status) and/or had previously received chemotherapy.²⁴

They were randomized to receive **20 mg of melatonin** or a **placebo** nightly, in addition to the cancer medication tamoxifen. For such aggressive cancer, the outcomes were remarkable:²⁴

- The **tumor response rate**, the percentage of patients who had improvement in their cancer, was significantly better in those receiving melatonin and tamoxifen.
- The one-year survival rate more than **doubled** in those taking melatonin.

A Note About Melatonin Dosing

To improve sleep, it's generally suggested to take **1 to 3 mg** of melatonin before bedtime.¹ However, human studies evaluating melatonin's effects on **cancer** often use higher doses, typically around **20 mg** per night.^{6,18,31}

Several other studies in cancer patients have shown benefits of melatonin added to treatments such as immunotherapy or chemotherapy.^{2,6,7,18,25-28}

In one of these studies, patients with **metastatic solid tumors** of various types were randomized to receive chemotherapy alone, or **20 mg** of melatonin daily in addition to their chemotherapy. The one-year **survival rate** and rate of **tumor regression** was *higher* with melatonin, with positive outcomes approximately **doubled**.²⁸

Another study of patients with cancer that had metastasized to the **brain** showed that taking melatonin improved one-year survival rates and mean survival times.²⁶

Meta-analyses of human trials have shown that cancer patients taking melatonin along with conventional treatment had **better survival rates** and **tumor response rates** than patients who don't receive melatonin.^{6,7,25}

These studies show that melatonin, when taken with standard cancer treatment, may enhance the efficacy of chemotherapy and mitigate side effects.

Easing Side Effects

Melatonin may also help minimize the negative effects of cancer treatments.²⁹

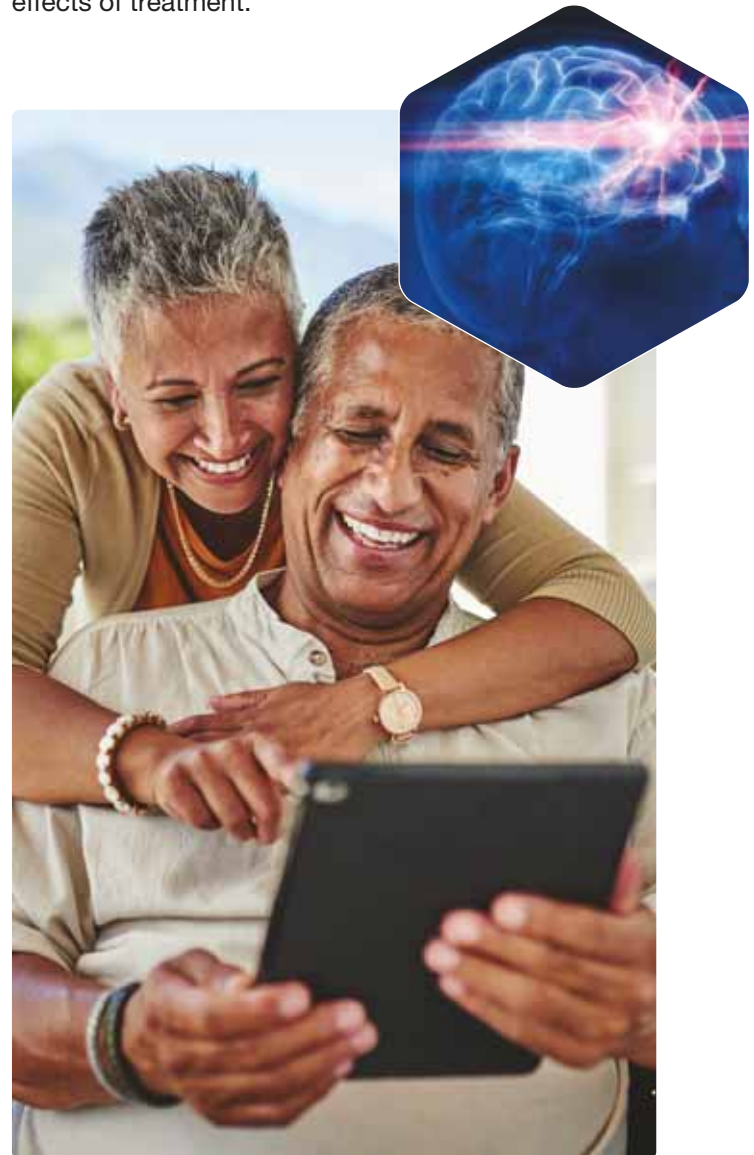
A review of human studies showed that melatonin may improve sleep quality and insomnia in patients with cancer.³⁰

In one trial of women with breast cancer, the treatment group received **18 mg** of melatonin daily, beginning one week prior to the treatment until two years after completion. After two years researchers concluded that long-term use of melatonin decreased the level of fatigue, which is common in cancer patients undergoing cancer treatment.³¹

Impaired cognitive function is a common side effect of chemotherapy. In a randomized controlled trial in women undergoing **chemotherapy** for breast cancer, **20 mg** of daily melatonin was taken before and during their first cycle of chemotherapy. Those who received melatonin experienced improvement in several markers of **cognitive function** as compared to placebo. In addition, there was improvement in sleep quality and reduction in symptoms of depression, compared to placebo.³²

Many chemotherapy and radiation treatments also cause potentially **lethal side effects**. Studies have found that melatonin protects against many of these, including low platelet counts, neurotoxicity and cardiotoxicity, weakness, and more.^{6,7,31,32}

Melatonin has been shown to augment some cancer therapies and protect against harmful side effects of treatment.



Summary

The hormone **melatonin** exhibits **anti-cancer** properties.

Human observational studies have shown lower levels of urinary melatonin are associated with increased risk of advanced prostate and breast cancer.

Studies of patients with existing cancer show that taking **oral melatonin** may increase **survival rate**, improve **tumor response**, and protect against **side effects** of other cancer treatments. •

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

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REVIEW

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References 1. Akay Internal Study. Liposomal vitamin C (calcium ascorbate) pharmacokinetics. Data on file. 2021.
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“Great product!”
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References

1. *Biomed Pharmacother.* 2016(3);78:50-9.
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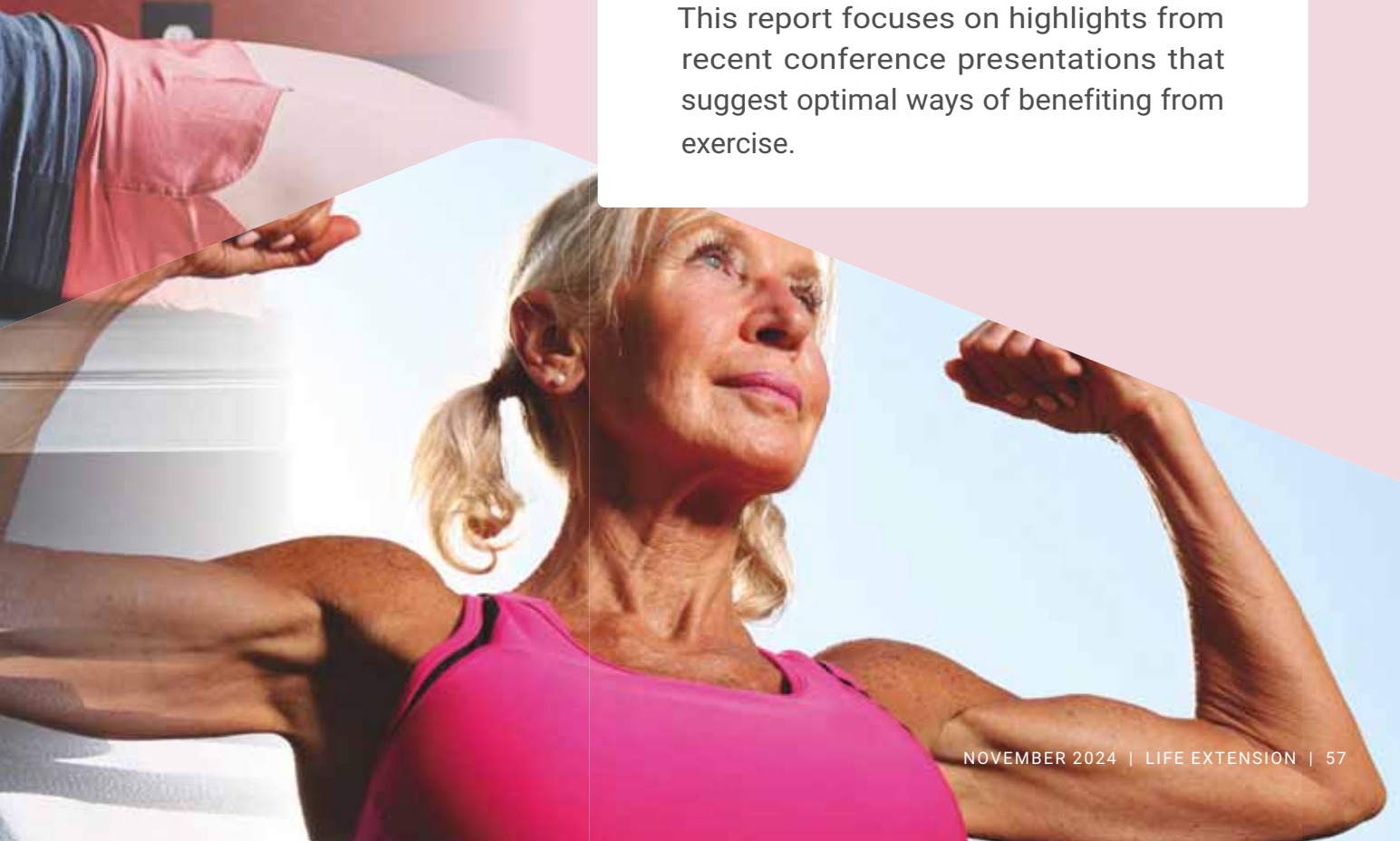
EXERCISE and HEALTH

Recent Conference Presentations

BY BEN BEST

Exercise is a frequent topic at health and longevity summits.

This report focuses on highlights from recent conference presentations that suggest optimal ways of benefiting from exercise.



Cardiorespiratory Fitness for Longevity

Rhonda Patrick, PhD (host of the FoundMyFitness podcast) is passionate about cardiorespiratory fitness for health and longevity. She has cited the fact that aerobic exercise, whether walking, running, or cycling, reduces both **systolic** (heart pumping) and **diastolic** (heart relaxing) blood pressure.¹

A meta-analysis of studies found that **longer** intervals of exercise will invariably increase cardiovascular fitness (measured by **VO₂ max**, the maximum volume of oxygen used by the body during intense exercise).² A recent study in men found that high-intensity interval training (short bursts of high-intensity full-body movements followed by short rest periods) increases VO₂ max more than sprint interval training (short bursts at maximal intensity followed by longer periods of rest). However, a review of 19 studies showed that both forms of exercise produce similar gains for cardiovascular fitness.^{3,4}

One study found that six minutes of high-intensity cycling intervals increased circulating **brain-derived neurotropic factor**, important for learning and memory, four to five times more than prolonged, low-intensity cycling.⁵



A study of middle-aged men, followed for 46 years, showed that **VO₂ max** was a significant predictor of cardiovascular mortality and all-cause mortality. Those in the **highest 5%** lived about **five years longer** than those in the **lowest 5%**.⁶ This and other evidence suggest that VO₂ max is a greater predictor of cardiovascular mortality and all-cause mortality than conventional risk factors such as obesity, high blood pressure, and insulin resistance. The most accurate prediction of mortality can be made when VO₂ max is tested in conjunction with these other risk factors.⁷

Dr. Patrick recommends “**exercise snacks**” as a convenient alternative to structured exercise at a gym. Avoiding prolonged sitting by quickly ascending 60 steps of stairs as quickly as possible every few hours can result in significant improvements in cardiovascular fitness. Dynamic warm-up, including 10 jumping jacks, 10 air squats, and five lunges on each side, and a one-minute walk for cool-down will facilitate these “snacks.”⁸

Aerobic exercise may even have benefits for **cancer** prevention and treatment. Scientists used a bio-mimicking circulatory system to recreate the environment of intense and low-intensity exercise to test its effects on cancer cells. The results showed that when cancer cells were in a high-intensity exercise environment they were able to be killed significantly better than in a low-stress environment. The cancer cells were killed by exercise-induced stress, while normal cells were unaffected.⁹ In colon cancer patients, a small clinical trial found that any intensity of exercise significantly reduced circulating cancer cells after six months.¹⁰

Metabolic Flexibility and Aging

John P. Thyfault, PhD (Professor of Cell Biology and Physiology at the University of Kansas Medical Center) studies the effects of fasting and exercise on metabolic health.

For people who are not exercising, after a meal the liver stores glucose as **glycogen**, which can provide glucose as an energy source for 10-14 hours. After that time, the body begins to use stored fat as energy. However, an hour of medium-intensity aerobic exercise, such as running, even four hours after a meal may be enough to start burning **fat**.¹¹ The ability to switch from glucose to fat as an energy source (“**metabolic flexibility**”) is enhanced by exercise but can be adversely affected by a poor diet. Animals fed high amounts of fat and sugar show impaired learning and memory,¹² which may be counteracted by exercise.

Dr. Thyfault noted that insulin resistance plays an important role in reducing metabolic flexibility.¹³ Getting **150 minutes per week** of moderate to vigorous exercise will reduce the risk of **type II diabetes** by **30%**.¹³ Insulin sensitivity declines rapidly within 24 to 48 hours after physical movements regardless of intensity.¹⁴ Even low-intensity exercise is sufficient to mobilize fat from fat cells, as well as increasing release of glucose from the liver.^{13,15}

Although aging is associated with increased insulin resistance and reduced metabolic flexibility, Dr. Thyfault contends that it is the chronic **inactivity** equally associated with getting older, compared to aging itself, that results in these effects.¹⁴

Benefits of Creatine

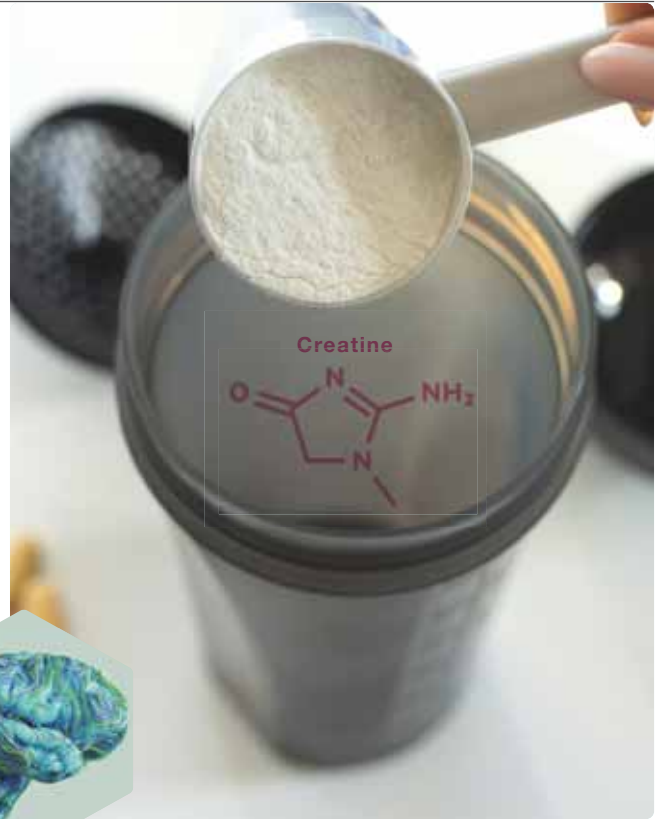
Eric Rawson, PhD (Professor of Health, Nutrition, and Exercise Science at Messiah University in Mechanicsburg, Pennsylvania) has devoted his career to studying the effects of **creatine** on the human body. Approximately **95%** of the creatine in the human body is found in skeletal muscle, where it makes energy rapidly available.¹⁶

The major source of creatine in the diet is meat. Creatine content in muscle is lower in **vegetarians** and the **elderly**. For this reason, creatine supplementation increases muscle creatine much more in the **elderly** and in **vegetarians** than in young people or meat-eaters.^{17,18}

Creatine supplementation combined with **resistance exercise** increases muscle strength and reduces fatigue more than exercise or supplementation alone.¹⁹ Some studies presented in a review paper show that **creatine supplementation** combined with resistance training produced beneficial impacts on bone health.²⁰

Creatine is important for **brain function**, although the brain can synthesize creatine and is therefore less dependent on other organs; however, it responds to supplementation. Research shows that creatine supplementation may increase brain creatine content by **5%-15%**.²¹ Creatine supplementation has been shown to be more beneficial for memory in vegetarians than in meat-eaters.²²

Creatine is safe and well tolerated in dosages up to **30 grams daily** for five years. However lower dosages may be all that are required.²³ One study found that **8 grams daily** for five days reduced mental fatigue on a math test and increased oxygen utilization to the brain.²⁴



Concluding Remarks

Most people understand that exercise contributes to health and longevity. Learning the mechanisms and conditions by which this occurs may increase people's motivation to exercise.

The effects on cognitive health are less often recognized, so it is worthwhile to learn about these benefits from experts. ●

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



**RHONDA
PATRICK, PhD**



**JOHN P.
THYFAULT, PhD**



**ERIC
RAWSON, PhD**



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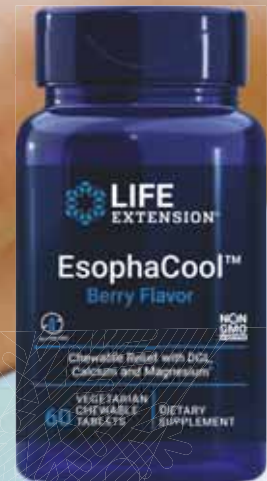
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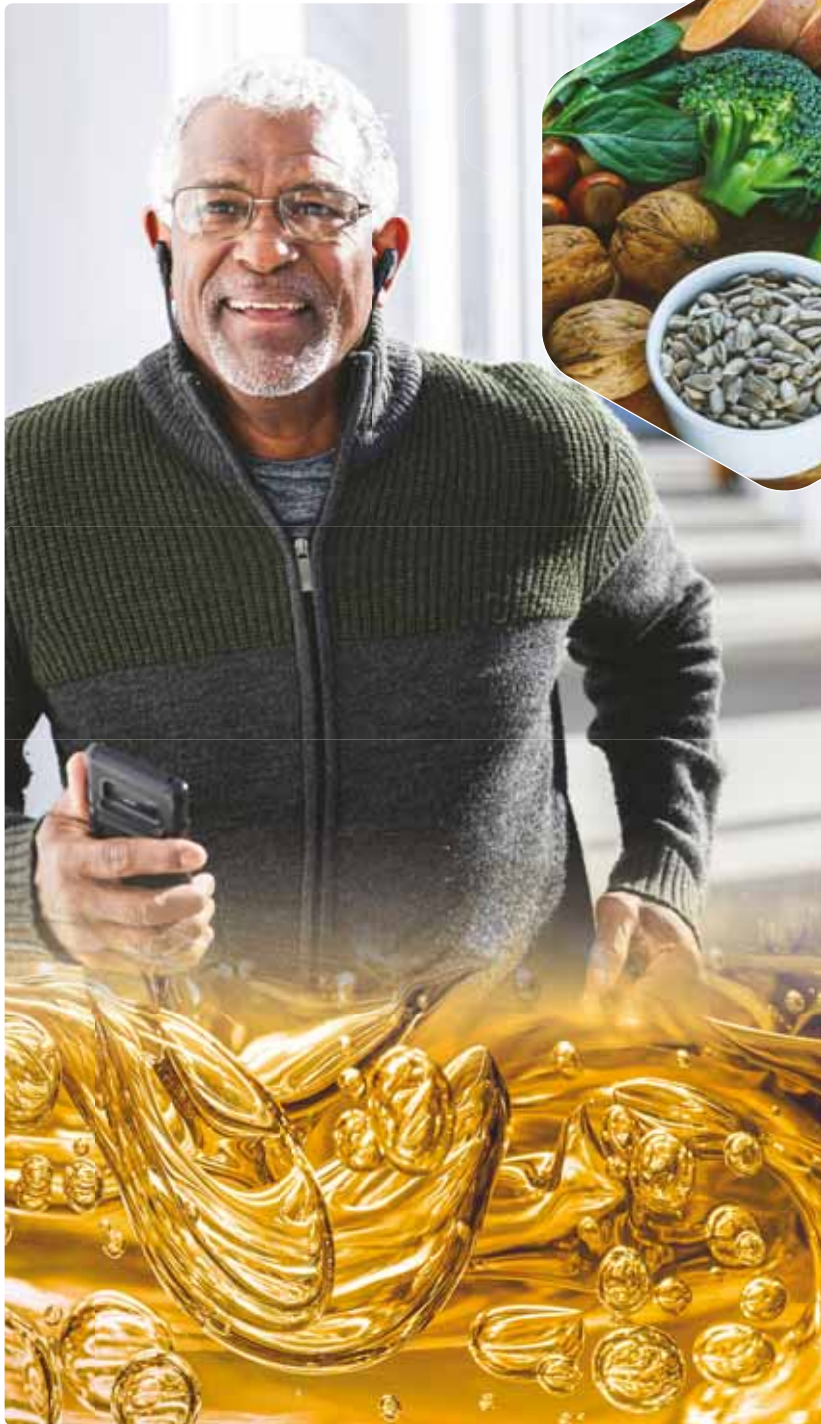
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What are Tocotrienols?

BY LAURIE MATHENA



Tocotrienols are one of two primary forms of **vitamin E**.¹

They play key roles in fighting oxidation,^{2,3} modulating immune function,⁴ combatting skin aging,⁴ and more.

While **tocopherols** are the well-known form of vitamin E, research has shown that **tocotrienols** carry greater antioxidant potential.⁵

Research further indicates that **tocotrienols** can help combat aging by blocking DNA damage,^{4,6} and they promote healthy aging by supporting immune functions,^{7,8} and improving cholesterol values^{9,10} and bone biomarkers.³

Five Effects of Tocotrienols

Tocotrienols come in four varieties: alpha-tocotrienol, beta-tocotrienol, gamma-tocotrienol, and delta-tocotrienol.¹¹

These tocotrienol forms of vitamin E provide a variety of anti-aging and health-supporting effects.

Below are five benefits, as demonstrated primarily in **human** studies:

1. Tocotrienols may protect against DNA damage.

A clinical trial in elderly people has suggested a beneficial effect of tocotrienols against DNA damage,⁶ which is an underlying factor in many aging processes.

In this human study, 64 elderly participants were randomized to receive either a **160 mg** tocotrienol supplement or a **placebo**, daily for six months. At the end of six months researchers found total DNA damage decreased significantly among the **tocotrienols** group compared to the **placebo**.

The ability to reduce DNA damage was likely due to antioxidant and signaling properties of tocotrienols either lowering DNA damage or improving repair.⁶

2. Tocotrienols could reduce the risk of cardiovascular disease in those with poor kidney function.

Elevated triglycerides and low levels of HDL (good) cholesterol are risk factors for cardiovascular disease.¹² In one study, tocotrienols were shown to help improve levels of both factors in patients with advanced kidney disease.

In patients undergoing dialysis for **kidney failure**, supplementation with a combination vitamin E supplement

containing tocotrienols (**180 mg**) and tocopherols (**40 mg**) resulted in a drop in triglyceride levels of **33 mg/dL** after 12 weeks and **36 mg/dL** after 16 weeks. Levels of HDL (“good”) cholesterol also increased.⁷

3. Tocotrienols could improve bone health.

A systematic review of preclinical studies suggested that tocotrienols could be useful in conditions characterized by excessive bone loss.¹⁰

In a separate study, a placebo-controlled clinical trial, the impact of supplementing with tocotrienols was evaluated in 89 postmenopausal women with **osteopenia** (a decrease in bone density that is less severe than osteoporosis). Results were measured in terms of biomarkers of bone metabolism in blood and urine.

Participants were randomized into three groups to receive daily:

- Placebo
- Low dose tocotrienols **430 mg**
- High dose tocotrienols **860 mg**

Blood and urine samples were collected at the beginning of the study and after 6 and 12 weeks. After 12 weeks, supplementation decreased markers of bone resorption (the breakdown of bone) and improved markers of bone turnover rate (the replacement of **new bone**) compared to placebo. The high and low doses appeared to be equally effective at improving the status of the bone biomarkers.⁹

4. Tocotrienols may help manage metabolic health.

In individuals with pre-diabetes, supplementation with **delta-tocotrienol (300 mg)** for 12 weeks led to significantly greater reductions in fasting plasma glucose, glycosylated hemoglobin A1C, insulin, and HOMA-IR (an indicator of insulin resistance and pancreatic beta cell function), compared to placebo.¹³

The researchers concluded that *supplementation with delta-tocotrienol significantly improves glycemic control in pre-diabetics.*



And in type II diabetics who were using anti-diabetic drugs, taking **250 mg** of delta-tocotrienol once daily for six months led to improvements in markers of glycemic control, inflammation, oxidative stress, and miRNA expression.¹⁴

5. Tocotrienols can help modulate immune response.

Rheumatoid arthritis (RA) is an autoimmune disease that attacks joints. In RA, the immune system attacks healthy tissue, causing inflammation and damage, leading to pain and tissue destruction in joints.

Cell studies have shown that tocotrienols help mitigate the bone-destructive processes that contribute to rheumatoid arthritis by decreasing the production of proteins involved in excess osteoclast activation.

Tocotrienols also decreased the differentiation of pro-inflammatory cells, called **Th17 cells**.² Th17 cells have been implicated in the development of many autoimmune diseases and inflammation.¹⁵

A different type of immune dysfunction can happen when an aging immune system has a weak response to a vaccine, resulting in diminished stimulation of immunity, and thus less protection from the immunization.

In one placebo-controlled clinical trial, participants were randomly assigned to receive supplementation with **400 mg** of mixed tocotrienols and tocopherols daily for two months or placebo, to evaluate the effects of the supplement on immune response. Participants' blood samples were evaluated at the beginning of the study and on days 28 and 56. They received the tetanus vaccine on day 28. The supplemented group showed a significantly **enhanced** production of **immune cells** and proteins compared with the **placebo** group.¹⁶

By bolstering the immune system, these forms of vitamin E may potentially enhance immune response to vaccines, improving their efficacy.

Summary

As potent antioxidants, tocotrienols have benefits throughout the entire body.

Studies show that **tocotrienols** support **DNA repair**.

In human studies, tocotrienols have demonstrated benefits in the areas of heart disease risk factors, immune regulation, metabolic health, and biomarkers of bone health. •

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

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Watercress

BY LAURIE MATHENA



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The Centers for Disease Control and Prevention has a list called “Powerhouse Fruits and Vegetables” that rates the foods most strongly associated with reducing the risk of chronic disease.

Watercress tops the list with the *highest nutrient density* score of 100.

It earned this number-one spot because it has the greatest bioavailability of 17 different key nutrients, including protein, calcium, iron, vitamins A, B6, B12, C, D, E, K, and others.¹ When compared to 12 other cruciferous vegetables, watercress was found to be one of the highest in phenols and the ability to neutralize free radicals.² Another study identified 132 flavonoid metabolites among four varieties of watercress.³

Traditionally, watercress was used as a remedy for high blood pressure, high cholesterol, high blood sugar, and conditions ranging from arthritis to bronchitis to scurvy.⁴

It also has well-documented antibacterial, anticancer, and anti-inflammatory properties, as well as protective effects for the heart, liver, kidneys, and more.⁴

One study showed that consuming watercress every day for eight weeks was associated with reduced DNA damage and increased concentrations of carotenoids. The researchers concluded that by decreasing damage to DNA and modulation of antioxidant status, consuming watercress could potentially contribute to a reduced risk of cancer.⁵

Like other cruciferous vegetables, watercress contains **glucosinolates**, which are plant compounds that are activated to a range of bioactive compounds including isothiocyanates and sulforaphane.

In animal and cell studies, these active glucosinolates have demonstrated actions against breast, colorectal cancer,^{4,6} prostate cancer,^{4,7} and skin cancer.⁸

In a study of human colon cancer cells, watercress extract was found to exert protective effects against three different stages of the cancer process.⁹

Watercress extract has also been shown to reduce liver injury that occurs as a result of arsenic, gamma radiation, and cholestatic hepatic injury.⁴

Watercress is as versatile as it is nutritious. It can be consumed in salads, tossed into smoothies, placed atop a sandwich, added to stir fries and omelets, and much more.

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Cancer Treatment Update



DR. GARY ONIK

BY LAURIE MATHENA



A Novel Cancer Vaccine

Over the past 40 years, Dr. Gary Onik has created and implemented multiple methods to detect and treat challenging malignancies.

And when Dr. Onik *himself* was faced with metastatic prostate cancer, he successfully used his own technique.

Five years later, Dr. Onik has personally celebrated something he has given to hundreds of patients before him—another anniversary of being *cancer-free*.

Dr. Onik was diagnosed with metastatic prostate cancer in 2018.

“I had prostate cancer with a very high PSA, and eventually I was going to die from it,” said Dr. Onik. “I refused to go on hormone treatment that would chemically castrate me. Instead, I knew of something else that could help: my own treatment.”

Three years earlier, Dr. Onik had pioneered a new therapy called intra-tumor immunotherapy.

Or, as Dr. Onik calls it, the *first cancer vaccine* of its kind.

Intra-tumor immunotherapy involves freezing a small portion of the tumor in a special way, which releases tumor proteins that the immune system can recognize. This is different from traditional cryosurgery, where freezing kills the tumor completely. The tumor is then directly injected with a checkpoint inhibitor* drug.¹

“We treat one small area of one tumor. After that, the patient’s immune system can recognize that tumor, go to other sites where metastatic tumors reside, and often kill those tumors as well,” said Dr. Onik. “We only have to do a procedure on one tumor, *and all of them often go away.*”

This patented process arms the immune system to create its own cancer vaccine out of the patient’s tumor without the side effects of *systemic checkpoint inhibitor* drugs or **CAR T****.

While Dr. Onik himself had successfully treated many cancer patients using his intra-tumor immunotherapy, no one else knew how to perform the procedure when he received his own cancer diagnosis.

But Dr. Onik wasn’t fazed by this roadblock.

Dr. Onik decided to have spinal anesthesia so that he could be awake to guide a colleague through the procedure.

“He thought I was out of my mind,” laughed Dr. Onik.

But eight weeks and two procedures later, Dr. Onik was *cancer-free*.

“On December 4, I reached my five-year anniversary with no metastatic disease,” said Dr. Onik.

40% Success Rate

Dr. Onik’s success story has been repeated in patients whose lives have been saved by his innovative cancer discoveries.

One of the first patients to undergo intra-tumor immunotherapy was Joe Lee, who was dying from metastatic prostate cancer. After undergoing a radical prostatectomy, the cancer had recurred, and he had tumors throughout his body.

“Lee was going to hospice. He only had weeks to live because he was essentially bleeding to death from a tumor invading his bladder,” said Dr. Onik.

He had a dramatic response to intra-tumor immunotherapy.

After the first month, Lee’s PSA went down by almost two-thirds. After the second month, his tumors vanished.

Nine years later, Lee remains cancer-free.

Dr. Onik has since treated nearly 200 patients with every kind of tumor using intra-tumor immunotherapy.

A preliminary retrospective analysis of 27 patients showed that this treatment has a complete response of **40%** in metastatic cancers including prostate, bladder, colon, and breast.² A complete response means that all signs of cancer have disappeared in response to treatment.

“These results are unheard of in patients previously deemed untreatable—and this is just the beginning,” said Dr. Onik.

Dr. Onik is currently working with Nova Southeastern University on sophisticated immune tests to identify which patients respond to the immune therapy and which do not.

Many types of cancers respond to intra-tumor immunotherapy.

A Track Record of Success

Dr. Onik has been revolutionizing the cancer industry since his days in radiology residency training in 1982, when he pioneered a new approach to cancer treatment called **image-guided tumor ablation**.

This radical new approach utilized ultrasound guidance in real-time to allow the doctor to guide a probe directly into the tumor, and then to destroy it with either freezing or heating. The tumor is left in place to be removed naturally by the body.

This procedure is especially useful for treating liver cancers that can’t be surgically removed (called unresectable tumors) due to their location.

“Image-guided tumor ablation changed that scenario. Finally, we had a method that could reliably destroy a tumor that couldn’t be surgically removed or destroyed by radiation or chemotherapy,” said Dr. Onik. “Patients with these unresectable tumors had no hope. Since then, data has shown that by using liver cryosurgery, we could benefit many patients.”

Marsha Sawyer was one of those patients.

* *Some of the checkpoint inhibitor drugs that Dr. Onik injects directly into the tumor include pembrolizumab (Keytruda®) and ipilimumab (Yervoy®). These drugs can cause serious side effects when systemically administered, but not when injected directly into a tumor.*

** *CAR T-cell therapy, or chimeric antigen receptor therapy, is a type of immunotherapy that helps the immune system identify and destroy cancer cells. It’s a complex treatment that can only be performed at registered hospitals with specialized healthcare professionals.*

At only 33 years old, this mother of two young children was diagnosed with a rare form of liver cancer called hepatic leiomyosarcoma. She was told that her cancer was inoperable and **100%** fatal.

Dr. Onik performed liver cryosurgery using image-guided tumor ablation on Marsha in 1987. Now, 37 years later, she is alive and cancer-free.

Many more followed, with overwhelmingly positive results.

“At five years after the procedure, the majority of patients who have undergone cryosurgery for liver cancer have no evidence of disease,” said Dr. Onik. “This procedure is done tens of thousands of times every year. It’s a part of the cancer treatment landscape now.”

Prostate Cancer

Another innovation of Dr. Onik’s that is widely used today, called image-guided focal ablation, has been shown to improve disease-free survival in prostate cancer while dramatically reducing side effects.

Until recently prostate cancer was treated as if the whole gland was involved, either by irradiation, freezing, or complete removal. All of these treatments come with complications like incontinence and impotence.

Adding insult to injury, in approximately **30%** of cases, *the cancer returns anyway*.³

Dr. Onik improved prostate cancer treatment in two ways: first by creating 3D prostate mapping, a new biopsy technique that is more accurate than the traditional biopsy, and second, by utilizing image-guided focal ablation to selectively destroy the cancer while leaving the rest of the prostate unharmed.

A study published in the *Journal of Men’s Health* followed 70 men who underwent optimized focal therapy to treat their prostate cancer.⁴

Maintaining potency and preventing incontinence were the main concerns. After 10 years, overall disease-free survival was **89%**. There was no urinary incontinence after the first treatment and **94%** of the study participants remained potent.

Focal therapy is also effective in men who have *recurrent* prostate cancer whose options would otherwise be limited to radical prostatectomy, chemical castration chemotherapy and/or radiation.

The treatment has also been found to be effective in liver, skin, lung, breast, and head and neck cancers.

Working Toward FDA Approval

Dr. Onik’s goal is to achieve the same level of widespread integration with intra-tumor immunotherapy as he has had with image-guided tumor ablation and focal therapy.

He is working to obtain funding for clinical trials. After that, he hopes to obtain a breakthrough designation from the FDA. This is a process that fast-tracks the development and review of treatments that can save lives.

While each individual component of the therapy is approved by the FDA, the novel combination of methods utilized in intra-tumor immunotherapy is not.

Because of that, insurance companies don’t cover the procedure, and as of now, only Dr. Onik and a handful of doctors he has trained are capable of performing it.

Without insurance coverage, anyone electing to undergo intra-tumor immunotherapy will pay somewhere in the range of \$100,000.

Dr. Onik is optimistic that intra-tumor immunotherapy could receive approval in as little as three years.

“Right from the very beginning, we were treating patients that nobody else could treat,” said Onik. “We were offering hope, and that’s what we’re continuing to offer now.” •

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

Anyone interested in utilizing any of the treatments mentioned in this article should contact Dr. Onik’s office by visiting <https://garyonikmd.com/contact/> or calling **561-527-2380**.

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

BRAIN HEALTH

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02510 Brain Fog Relief
- 01659 CDP Choline
- 02321 Cognitex® Alpha GPC
- 02396 Cognitex® Elite

- 02397 Cognitex® Elite Pregnenolone
- 01540 DMAE Bitartrate
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 01658 Ginkgo Biloba Certified Extract™
- 01527 Huperzine A
- 00020 Lecithin
- 02101 Memory Protect
- 00709 Migra-Eeze™
- 01603 Neuro-Mag® Magnesium L-Threonate Caps
- 02032 Neuro-Mag® Magnesium L-Threonate Powder
- 00888 Optimized Ashwagandha
- 01676 PS (Phosphatidylserine) Caps
- 02406 Quick Brain Nootropic™
- 01327 Vinpocetine

CHOLESTEROL MANAGEMENT

- 01828 Advanced Lipid Control
- 01910 CHOL-Support™
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

DIGESTION SUPPORT

- 02412 Bloat Relief
- 02514 Easy Fiber
- 01736 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™

ENERGY MANAGEMENT

- 01628C Adrenal Energy Formula • 60 veg capsules
- 01630C Adrenal Energy Formula • 120 veg capsules
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 01805 Ginseng Energy Boost
- 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 Elite™
- 01500 PQQ Caps • 10 mg, 30 vegetarian capsules
- 01647 PQQ Caps • 20 mg, 30 vegetarian capsules
- 00889 Rhodiola Extract
- 02003 Thyroid Support Complex

EYE HEALTH

- 01923 Astaxanthin with Phospholipids
- 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

- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
- 01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
- 01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels
- 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
- 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
- 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
- 01812 Provinal® Purified Omega-7
- 01640 Vegetarian DHA

FOOD

- 02008 California Estate Extra Virgin Olive Oil
- 02170 Rainforest Blend Decaf Ground Coffee
- 02169 Rainforest Blend Ground Coffee
- 02171 Rainforest Blend Whole Bean Coffee

GLUCOSE MANAGEMENT

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

HEART HEALTH

- 02530 Aged Black Garlic
- 01066 Aspirin (Enteric Coated)
- 01842 BioActive Folate & Vitamin B12 Caps
- 02531 Cardio Peak™
- 02121 Homocysteine Resist
- 02508 Omega-3 Fish Oil Gummy Bites
- 02018 Optimized Carnitine
- 01949 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 50 mg, 60 softgels
- 01951 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 100 mg, 60 softgels
- 01929 Super Ubiquinol CoQ10
- 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
- 01425 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels
- 01437 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels
- 01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels
- 01431 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels
- 01733 Super Ubiquinol CoQ10 with PQQ
- 01859 TMG Liquid Capsules
- 00349 TMG Powder

HORMONE BALANCE

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

IMMUNE SUPPORT

- 02302 Bio-Quercetin®
- 02410 Black Elderberry + Vitamin C
- 02433 Echinacea Elite
- 01961 Enhanced Zinc Lozenges
- 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic
- 02005 Immune Senescence Protection Formula™
- 01681 Lactoferrin (Apolactoferrin) Caps
- 02426 Mushroom Immune with Beta Glucans
- 01903 NK Cell Activator™
- 01394 Optimized Garlic
- 01309 Optimized Quercetin
- 01811 Peony Immune
- 01708 Reishi Extract Mushroom Complex
- 01906 Standardized Cistanche
- 01561 Zinc Lozenges

INFLAMMATION HEALTH SUPPORT

- 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™
- 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
- 56886 Restore Activ Joint Muscle & Tissue
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract

JOINT SUPPORT

- 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 02529 Lower Back Relief
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

KIDNEY & BLADDER SUPPORT

- 00862 Cran-Max® Cranberry Whole Fruit Concentrate
- 01424 Optimized Cran-Max®
- 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
- 02240C Anti-Alcohol Complex
- 01651 Calcium D-Glucarate
- 01571 Chlorophyllin
- 02402 FLORASSIST® Liver Restore™
- 02521 Glutathione
- 01541 Glutathione, Cysteine & C
- 01393 HepatoPro
- 01608 Liver Efficiency Formula
- 01522 Milk Thistle • 60 veg capsules
- 01534 N-Acetyl-L-Cysteine
- 01884 Silymarin
- 02361 SOD Booster

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin®
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02431 Essential Youth - L-Ergothioneine
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 02527 Healthy Aging Powder
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol Elite™
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol Elite™
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

LUNG HEALTH

- 02512 Healthy Lungs

MEN'S HEALTH

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Control
- 02515 Men's Vitality Packs
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans

- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

MINERALS

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

MISCELLANEOUS

- 00577 Potassium Iodide

MOOD & STRESS MANAGEMENT

- 02519 Ashwagandha Plus
- 02434 Calm-Mag
- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 01683 L-Theanine
- 02175 SAME (S-Adenosyl-Methionine)
200 mg, 30 enteric coated vegetarian tablets
- 02176 SAME (S-Adenosyl-Methionine)
400 mg, 30 enteric coated vegetarian tablets
- 02174 SAME (S-Adenosyl-Methionine)
400 mg, 60 enteric coated vegetarian tablets
- 02429 Theanine XR™ Stress Relief

MULTIVITAMINS

- 02199 Children's Formula Life Extension Mix™
- 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
- 02428 Whole Food Multivitamin

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

- 02322 Hair, Skin & Nails Collagen Plus Formula
- 01278 Life Extension Toothpaste
- 00408 Venotone
- 02252 Youthful Legs

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

- 01622 Bifido GI Balance
- 01825 FLORASSIST® Balance
- 02421 FLORASSIST® Daily Bowel Regularity
- 02125 FLORASSIST® GI with Phage Technology
- 01821 FLORASSIST® Heart Health
- 02250 FLORASSIST® Mood Improve
- 02208 FLORASSIST® Immune & Nasal Defense
- 02120 FLORASSIST® Oral Hygiene
- 02203 FLORASSIST® Prebiotic
- 02505 FLORASSIST® Probiotic Women's Health

SKIN CARE

- 02423 Daily Skin Defense
- 01938 Shade Factor™
- 02129 Skin Care Collection Anti-Aging Serum
- 02130 Skin Care Collection Day Cream
- 02131 Skin Care Collection Night Cream
- 02096 Skin Restoring Ceramides
- 02528 Vegan Pro Collagen

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 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 tabs
- 01721 Optimized Tryptophan Plus
- 01445 Quiet Sleep Melatonin • 5 mg, 60 veg capsules
- 02502 Rest & Renew
- 02526 Serene Sleep

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin®
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin
1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin
5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin®
60 veg tablets
- 02227 Vitamin C and Bio-Quercetin®
250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite
100 mg, 60 veg capsules
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control™

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 02534 Estrogen Balance Elite
- 01894 Estrogen for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

THiNK ZiNC

FOR IMMUNE HEALTH

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

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

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



Item #01813

50 mg • 90 vegetarian capsules

1 bottle \$6.75 • 4 bottles \$6 each



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

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

OptiZinc® is a Lonza trademark, registered in the USA.

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.



BODY & BRAIN



BIOACTIVE FORMS OF VITAMIN B12

B12 Elite provides both:

ADENOSYLCOBALAMIN

- Active in brain cell mitochondria.
- Supports nerve cell function.
- Supports cellular energy production.

METHYLCOBALAMIN

- Supports brain cell function.
- Promotes red blood cell production.
- Helps maintain healthy homocysteine levels.

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

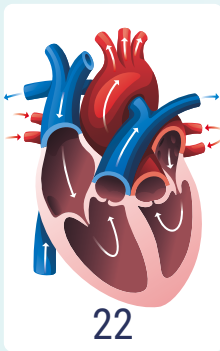


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