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January 2022

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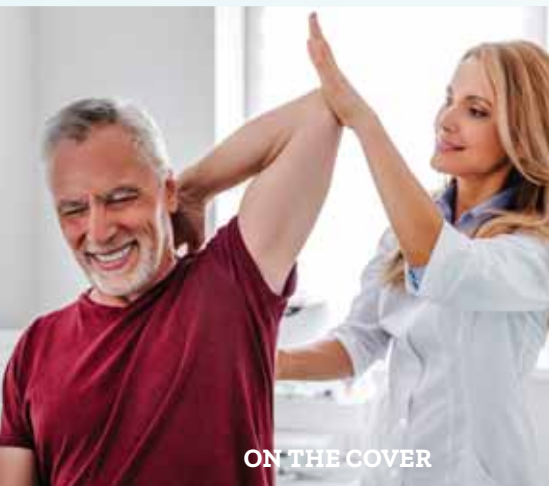
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Life Extension® Magazine values your opinion and welcomes feedback.

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Letters to the Editor, PO Box 407198, Fort Lauderdale, FL 33340

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



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Soaring Deaths From Pain-Relieving Drugs



WILLIAM FALOON



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

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

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

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

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

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

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

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

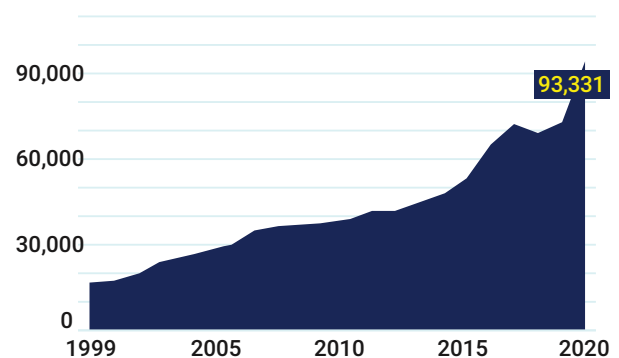
CDC data show that drug-related overdose deaths in **2020** hit a record high of **93,331** Americans.^{8,9}

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

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

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

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



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

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

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

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

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

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

Non-Prescription Pain Killers

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

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

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

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



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

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

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

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

Our Position on Routine Pain Relief

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

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

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

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

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

Excess Dietary Omega-6 Fats Cause Painful Inflammation

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

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

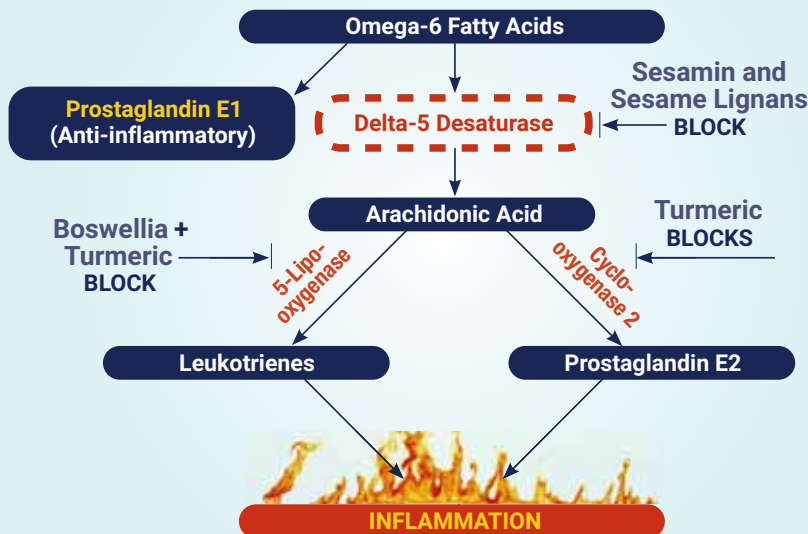
When one ingests an **omega-6** fat, there are two major pathways it follows in the body.

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

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



How Plant Extracts Reduce Inflammation



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

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

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

Clinical Trial Compares Nutrients to Acetaminophen

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

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

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

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

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

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

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

Fast- versus Slow-Acting Nutrients

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

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

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

Young Bodies Heal Fast

Children's injuries usually heal quickly.

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

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

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

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

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

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

In this month's issue...

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

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

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

Anti-Aging Update

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

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

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

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

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

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

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

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

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

For longer life,



William Faloon, Co-Founder
Life Extension Buyers Club

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

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

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

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

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

Origins of the Opioid Crisis

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

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

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

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

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

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



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

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

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

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



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

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

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



Novel Hyperbaric Oxygen Protocol Extends Telomere Length and Improves Immune Markers

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

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

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

**Aviv Clinic
The Villages, FL 32163**

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

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Increase **AMPK** to Better Manage Body Weight

Most people today consume excess calories.

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

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

Reduce Cell Fat Storage

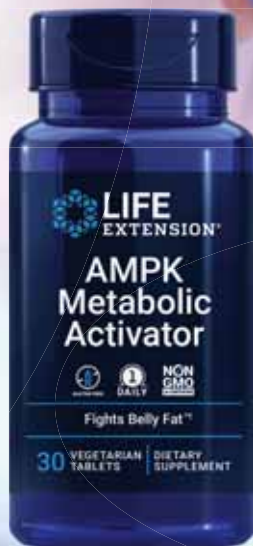
Scientific studies show that increasing AMPK activity can encourage cells to store less fat and burn it as energy.^{2,3}

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

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

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SUPER SALE PRICE

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This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results are not guaranteed, and results may vary.

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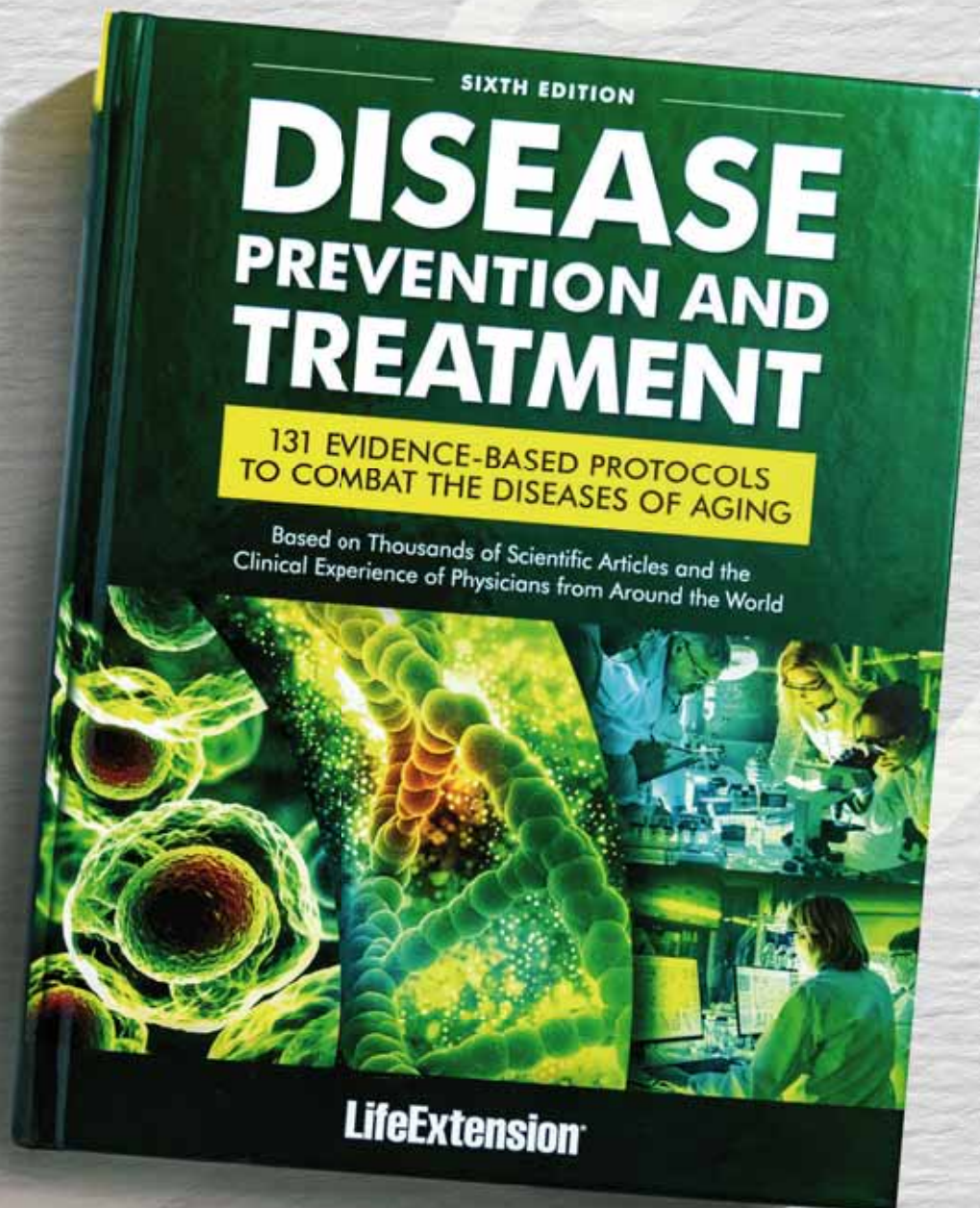
Clinically studied **plant extracts** can safely relieve occasional minor soreness of muscles and joints.*

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

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

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

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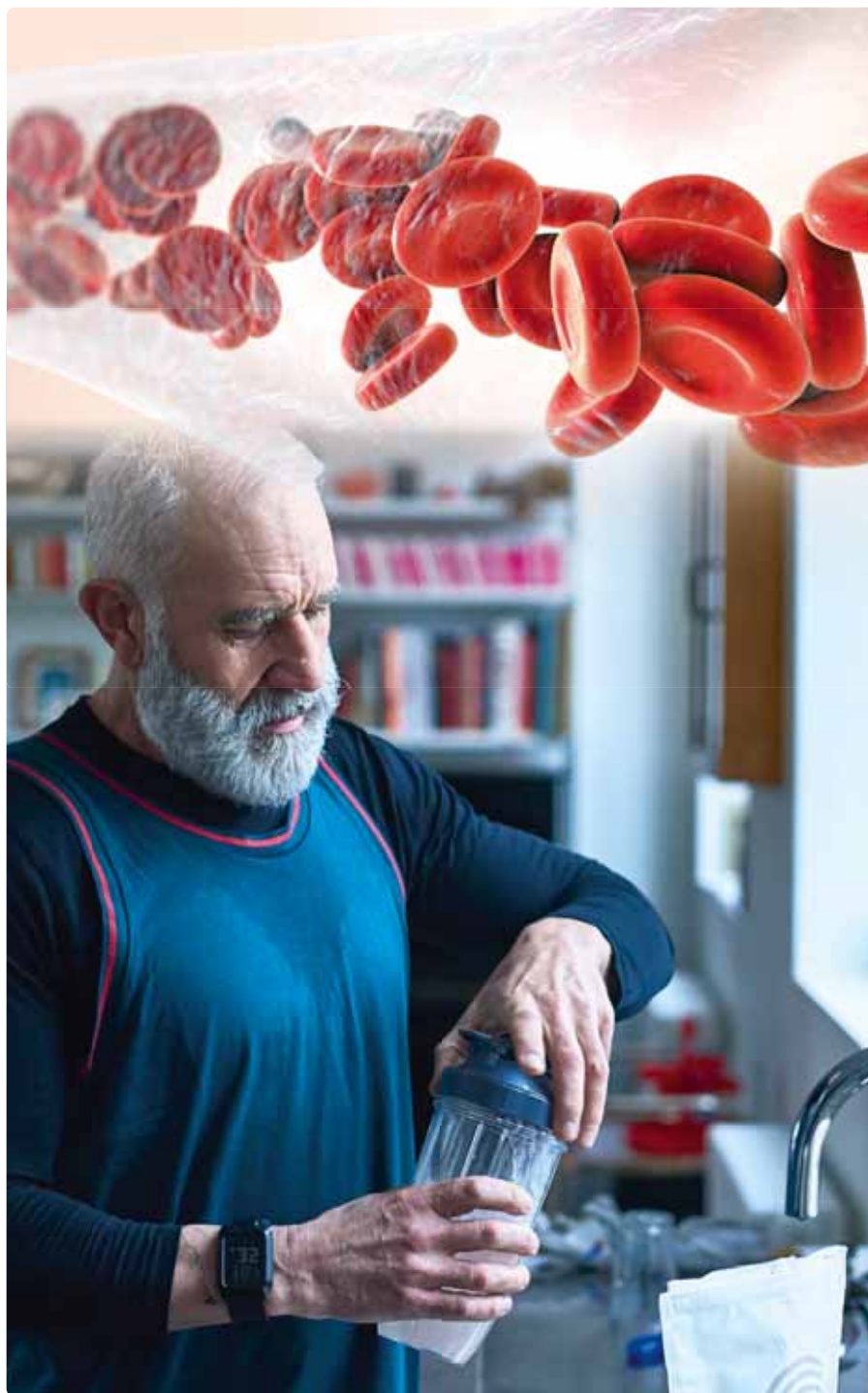
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In the News



Whey Protein Improves Microvascular Function in Heart Failure Patients

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

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

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

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

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

Greater Magnesium Intake Linked with Lower Liver Cancer Risk

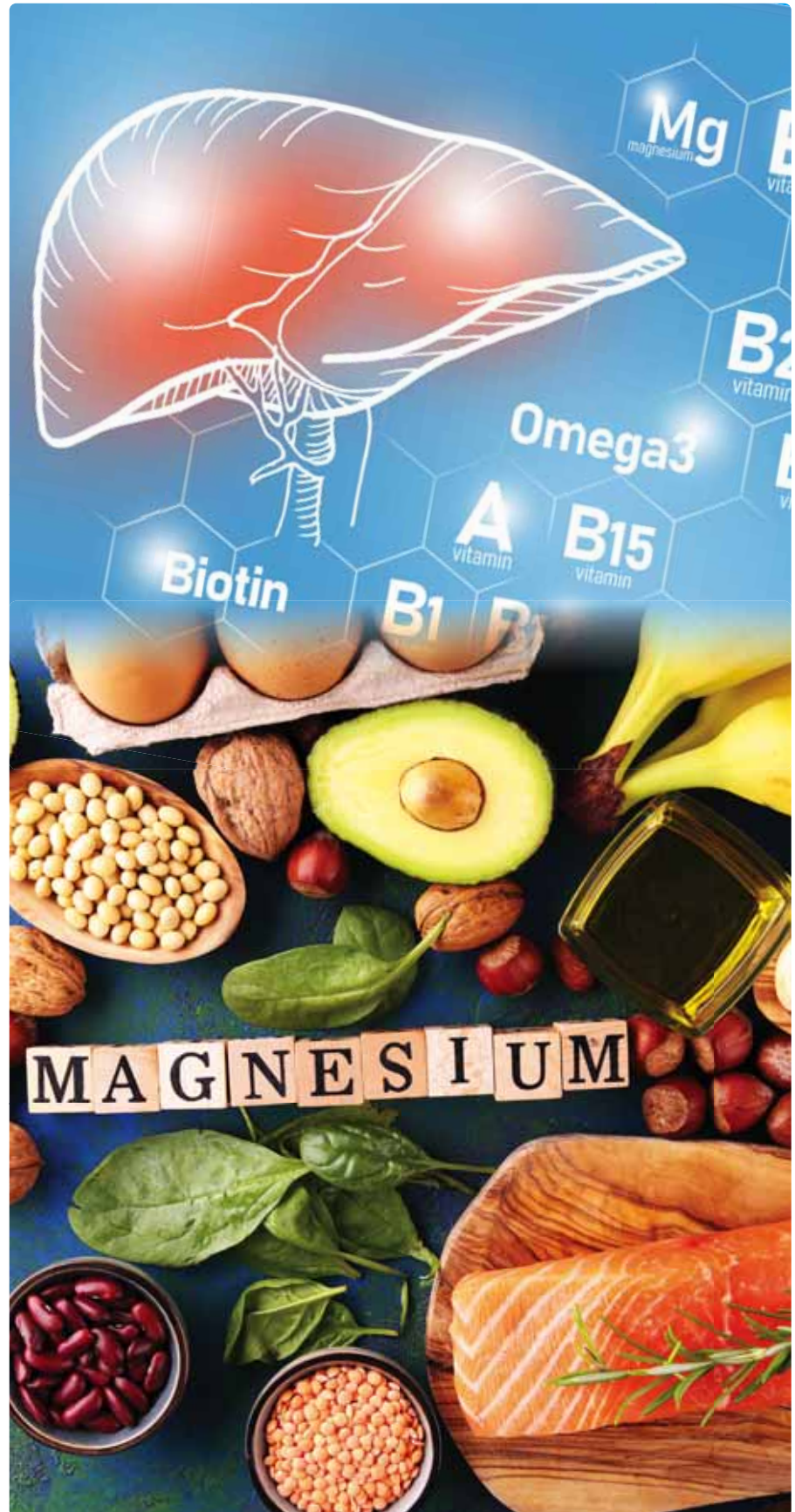
Increased intake of magnesium has a protective effect against the risk of developing liver cancer, an article published in *The American Journal of Clinical Nutrition* reported.*

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

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

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

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





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

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

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

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

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

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

B Vitamins Benefit Stroke Patients

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

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

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

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

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



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

Testosterone Elite helps maintain healthy testosterone levels:[†]

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

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

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



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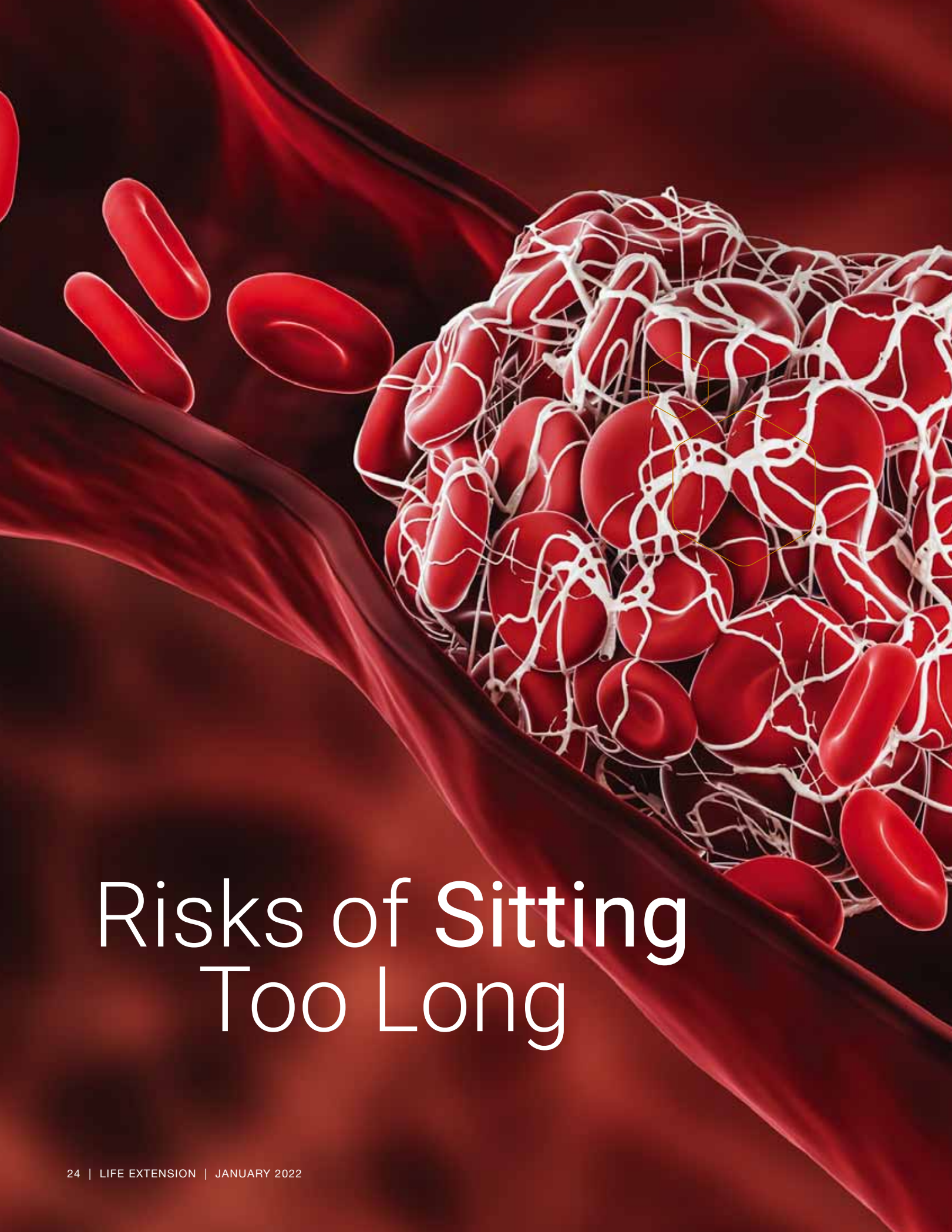
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Risks of Sitting Too Long



BY MARSHA MCCULLOCH, MS, RD



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

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

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

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

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

Sitting Too Long Can Be Deadly

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

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

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

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

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

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

The Risk Factors

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

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



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

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

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

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

Anti-Clotting Activity of Nattokinase

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

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

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

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

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

Putting Nattokinase to the Test

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

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

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

WHAT
YOU
NEED
TO
KNOW

Defend Against Deep Vein Thrombosis

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



Complete Relief

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

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

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

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

How French Maritime Pine Bark Helps

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

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

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

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

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

Stop Swelling

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

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

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

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

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

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

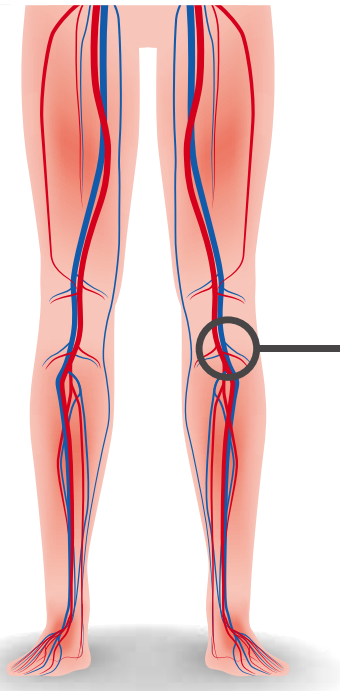
Prevent DVT Recurrence

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

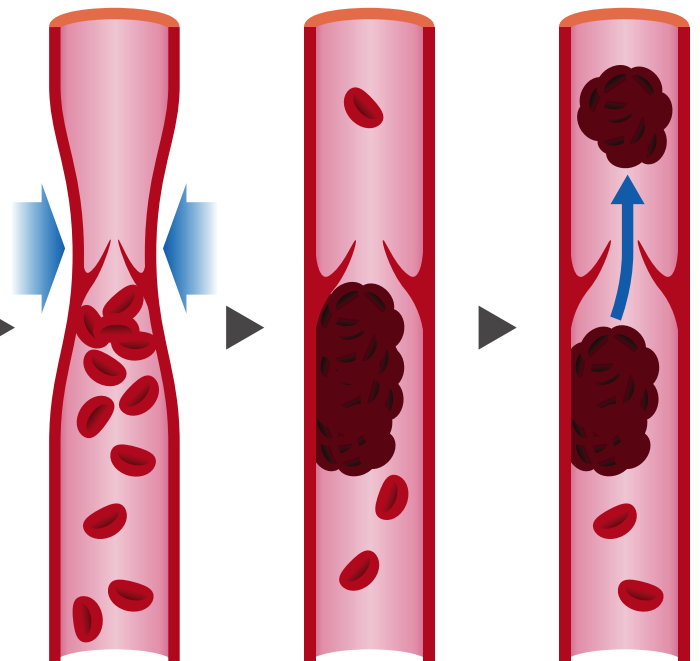
The highest risk of recurrence is within the first year. But a heightened risk remains for the **rest of a person's life**.³⁹

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

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



VEIN THROMBOSIS





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

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

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

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

More Powerful Together

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

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

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

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

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

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

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

Summary

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

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

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

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

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

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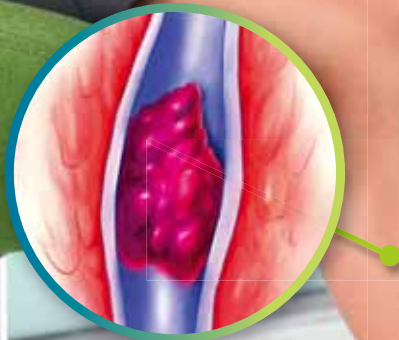
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* *Br J Pharmacol.* 2004 Mar;141(5):825-30.



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

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VINPOCETINE

Improves Hearing Capacity

BY CHANCELLOR FALOON



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

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

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

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

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

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

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

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

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

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

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

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

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

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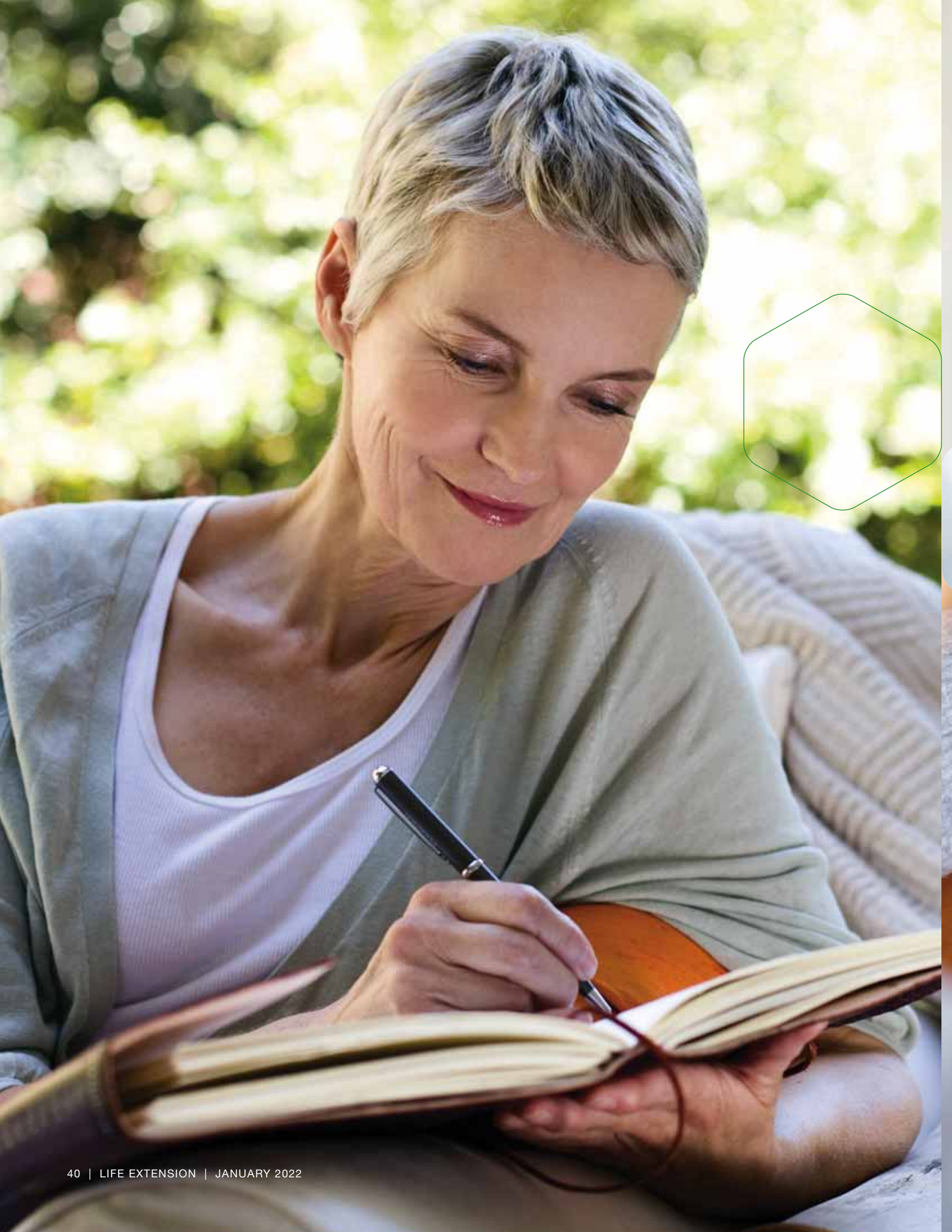
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Nutrients to *Reduce* Memory Loss



BY MIKE JENSEN

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

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

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

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

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

A Progressive Condition

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

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

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

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

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

Brain Changes and Dementia

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

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

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

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

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

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

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

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

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

Lithium Protects the Brain

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

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

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

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



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

Human Trials of Lithium

Lithium may help slow the worsening of cognitive decline.

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

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

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

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

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

WHAT
YOU
NEED
TO
KNOW



Help Prevent Brain Aging

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





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

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

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

Proline-Rich Polypeptides Fight Brain Aging

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

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

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

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

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

Human Studies of Proline-Rich Polypeptides

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

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

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

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

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

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

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

Summary

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

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

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

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

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

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

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



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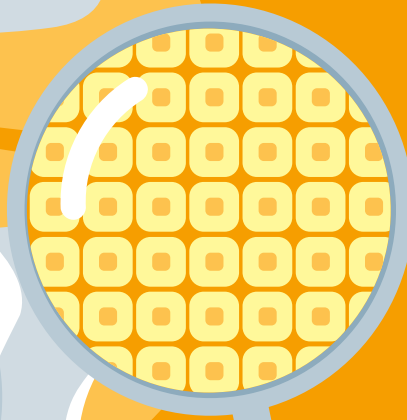
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FAST RELIEF for **Acute** **Pain**





BY MARSHA MCCULLOCH, MS, RD

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

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

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

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

Acute Musculoskeletal Pain

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

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

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

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

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

Pain-Relieving Plants

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

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

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

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

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

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



Boswellia serrata



Turmeric



Black Sesame Seeds

Testing the Combination

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

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

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

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

Safe and Effective Pain Relief

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

WHAT
YOU
NEED
TO
KNOW



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

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

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

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



Fast-Acting Relief

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

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

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

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

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

Reduced Pain Intensity

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

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

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

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

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

Superior To Medication

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

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

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

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

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

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

How It Works

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

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

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

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

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

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

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

Free From Side Effects

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

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

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

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

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



Summary

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

These painkillers carry the risk of harmful side effects.

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

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

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



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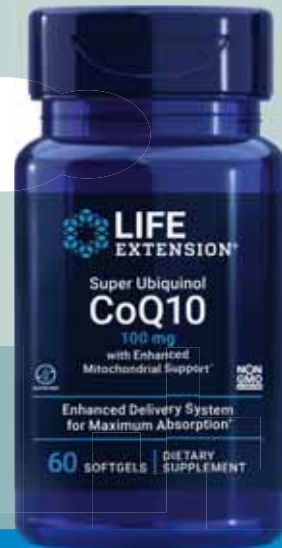
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A Probiotic That *Lowers* Cholesterol

BY MICHAEL DOWNEY

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

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

Science has found a novel way to help reduce cholesterol.

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

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

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

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

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

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

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

The Importance of Gut Bacteria

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

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

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

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

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

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



Lowering Cholesterol in Human Studies

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

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

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

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

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

Benefits Beyond Cholesterol

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

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

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

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

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


 WHAT YOU NEED TO KNOW

Protect the Heart with a Probiotic

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

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

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

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

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



How *L. Reuteri* NCIMB 30242 Works

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

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

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

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

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

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

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

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

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

Proven Safety

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

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

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

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

Summary

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

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

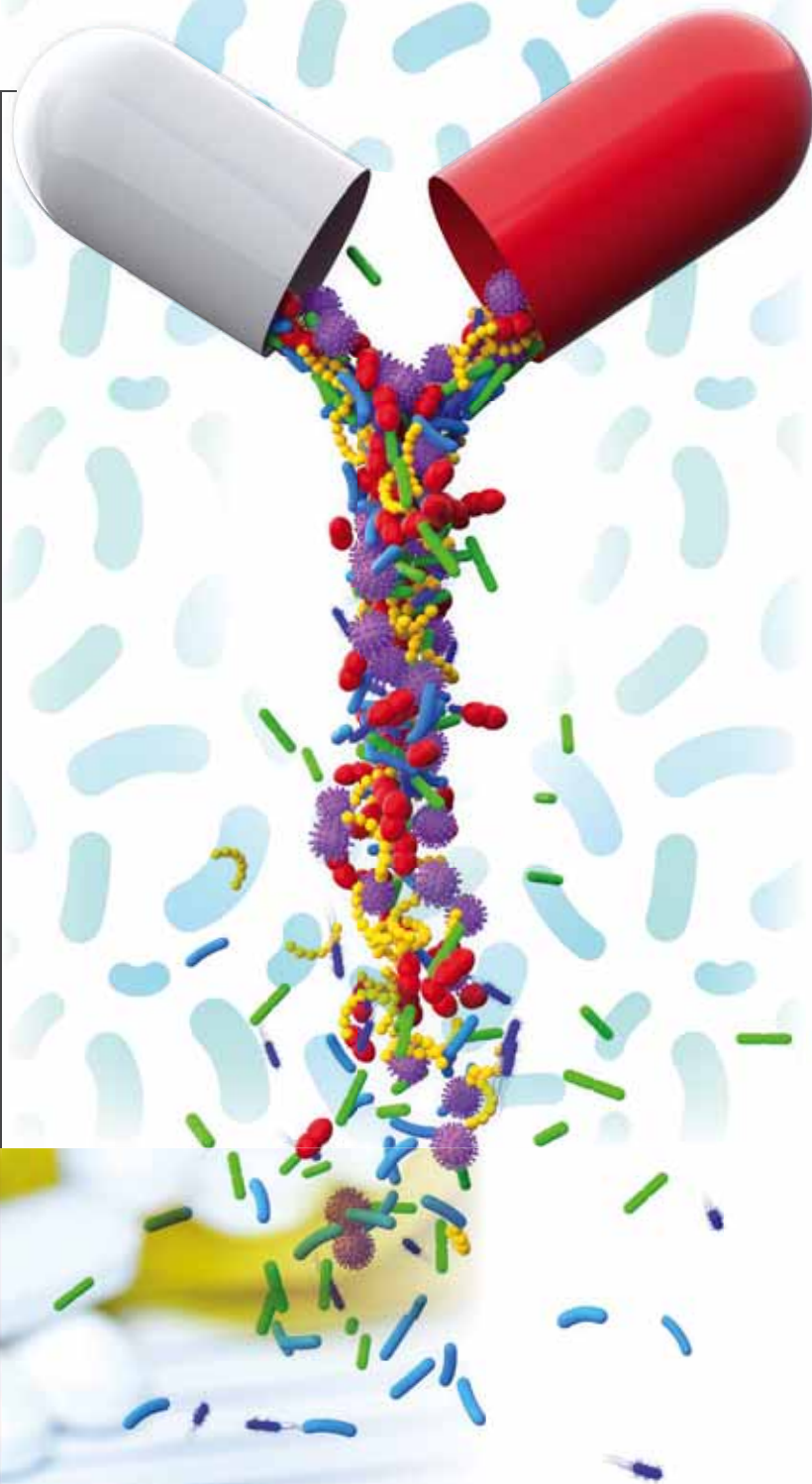
If you have any questions on the scientific content of this article, please call a **Life Extension Wellness Specialist** at 1-866-864-3027.

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Total Cholesterol:	Goal < 200
HDL "good" Cholesterol:	Goal > 40
LDL "bad" Cholesterol:	Goal < 100, ¹
Triglycerides:	Goal < 150

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

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

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MAGNESIUM

Mitigates Migraines



BY CHANCELLOR FALOON

Migraines are among the leading causes of disability worldwide.¹

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

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

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

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

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

Magnesium vs Conventional Medication

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

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

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

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

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

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

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

A Successful Combined Approach

Preventing and treating migraines sometimes requires a multifaceted approach.

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

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

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

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

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

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

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



WHAT
YOU
NEED
TO
KNOW

Summary

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

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

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

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

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

Migraine Relief at Last

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

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



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The Mindspan Diet:

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

BY PRESTON ESTEP III, PHD



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

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

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

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

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

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

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

—LAURIE MATHENA

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

Dr. Estep: Here is a short list:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LE: What other key biomarkers should people be testing?

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

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

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

LE: Isn't iron beneficial for the body?

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

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

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

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

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

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

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

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

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

LE: How does excess iron impact the brain specifically?

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

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

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

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

LE: Why do so many people have excess iron?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LE: What about APP?

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

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

GENES + ENVIRONMENT = TRAIT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LE: Please tell us about your current projects.

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

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

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

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

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

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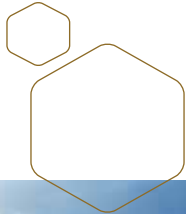
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John Robbins

The Remarkable Legacy of the Baskin-Robbins Heir

BY LAURIE MATHENA



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

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

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

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

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

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

Walking Away from the Family Business

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

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

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

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

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

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

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

A Legacy Better than Ice Cream

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

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

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

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

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

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

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

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

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





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Changing the World One Bite at a Time

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

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

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

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

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

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

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

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

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

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

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

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

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

Let Food be Thy Medicine

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

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

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

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

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

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

Living a Vibrant Life

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

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

He lived off less than \$500 per year.

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

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

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

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

He also takes targeted supplements for increased healthspan and lifespan.

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

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

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

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

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

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

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

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



Fennel

BY LAURIE MATHENA



Reference

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

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

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

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

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

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

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

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BRAIN HEALTH

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

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

CHOLESTEROL MANAGEMENT

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

DIGESTION SUPPORT

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

ENERGY MANAGEMENT

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

EYE HEALTH

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

FISH OIL & OMEGAS

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

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

FOOD

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

GLUCOSE MANAGEMENT

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

HEART HEALTH

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

HORMONE BALANCE

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

IMMUNE SUPPORT

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

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

INFLAMMATION MANAGEMENT

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

JOINT SUPPORT

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

KIDNEY & BLADDER SUPPORT

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

LIVER HEALTH & DETOXIFICATION

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

LONGEVITY & WELLNESS

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

MEN'S HEALTH

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

MINERALS

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

MISCELLANEOUS

- 00577 Potassium Iodide
- 00657 Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT

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

MULTIVITAMINS

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

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

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

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

- 01622 Bifdo GI Balance
- 01825 FLORASSIST® Balance
- 02421 FLORASSIST® Daily Bowel Regularity
- 02125 FLORASSIST® GI with Phage Technology
- 01821 FLORASSIST® Heart Health
- 02250 FLORASSIST® Mood Improve
- 02208 FLORASSIST® Immune & Nasal Defense
- 02120 FLORASSIST® Oral Hygiene
- 02203 FLORASSIST® Prebiotic
- 01920 FLORASSIST® Throat Health
- 02400 FLORASSIST® Winter Immune Support
- 52142 Jarro-Dophilus® for Women
- 00056 Jarro-Dophilus EPS® • 60 veg capsules
- 21201 Jarro-Dophilus EPS® • 120 veg capsules
- 01038 Theralac® Probiotics
- 01389 TruFlora® Probiotics

SKIN CARE

- 80157 Advanced Anti-Glycation Peptide Serum
- 80165 Advanced Growth Factor Serum
- 80170 Advanced Hyaluronic Acid Serum
- 80154 Advanced Lightening Cream
- 80155 Advanced Peptide Hand Therapy
- 80175 Advanced Probiotic-Fermented Eye Serum
- 80177 Advanced Retinol Serum
- 80152 Advanced Triple Peptide Serum
- 80140 Advanced Under Eye Serum with Stem Cells
- 80137 All-Purpose Soothing Relief Cream
- 80139 Amber Self MicroDermAbrasion
- 80118 Anti-Aging Mask
- 80151 Anti-Aging Rejuvenating Face Cream

- 80153 Anti-Aging Rejuvenating Scalp Serum
- 80179 Brightening Peptide Serum
- 80176 Collagen Boosting Peptide Cream
- 80156 Collagen Boosting Peptide Serum
- 02408 Collagen Peptides for Skin & Joints
- 80180 CoQ10 and Stem Cell Rejuvenation Cream
- 80169 Cucumber Hydra Peptide Eye Cream
- 02423 Daily Skin Defense
- 80141 DNA Support Cream
- 80163 Eye Lift Cream
- 80123 Face Rejuvenating Anti-Oxidant Cream
- 80109 Hyaluronic Facial Moisturizer
- 80110 Hyaluronic Oil-Free Facial Moisturizer
- 80138 Hydrating Anti-Oxidant Facial Mist
- 00661 Hydroderm
- 55495 Instensive Moisturizing Cream
- 80103 Lifting & Tightening Complex
- 80168 Melatonin Advanced Peptide Cream
- 80114 Mild Facial Cleanser
- 80172 Multi Stem Cell Hydration Cream
- 80159 Multi Stem Cell Skin Tightening Complex
- 80122 Neck Rejuvenating Anti-Oxidant Cream
- 80174 Purifying Facial Mask
- 80150 Renewing Eye Cream
- 80142 Resveratrol Anti-Oxidant Serum
- 01938 Shade Factor™
- 02129 Skin Care Collection Anti-Aging Serum
- 02130 Skin Care Collection Day Cream
- 02131 Skin Care Collection Night Cream
- 80166 Skin Firming Complex
- 02096 Skin Restoring Ceramides
- 80130 Skin Stem Cell Serum
- 80164 Skin Tone Equalizer
- 80143 Stem Cell Cream with Alpine Rose
- 80148 Tightening & Firming Neck Cream
- 80161 Triple-Action Vitamin C Cream
- 80162 Ultimate MicroDermabrasion
- 80173 Ultimate Peptide Serum
- 80178 Ultimate Telomere Cream
- 80160 Ultra Eyelash Booster
- 80101 Ultra Wrinkle Relaxer
- 80113 Under Eye Refining Serum
- 80104 Under Eye Rescue Cream
- 80171 Vitamin C Lip Rejuvenator
- 80129 Vitamin C Serum
- 80136 Vitamin D Lotion
- 80102 Vitamin K Cream

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01551 Enhanced Sleep with Melatonin
- 01511 Enhanced Sleep without Melatonin
- 02234 Fast-Acting Liquid Melatonin
- 01669 Glycine
- 02308 Herbal Sleep PM
- 01722 L-Tryptophan
- 01668 Melatonin • 300 mcg, 100 veg capsules
- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets

- 01786 Melatonin 6 Hour Timed Release 3 mg, 60 veg tablets
- 01721 Optimized Tryptophan Plus
- 01444 Quiet Sleep
- 01445 Quiet Sleep Melatonin
- 02502 Rest & Renew

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 00664 Beta-Carotene
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin Phytosome
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00065 MK-7
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 02335 Super K Elite
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin Phytosome • 60 veg tablets
- 02227 Vitamin C and Bio-Quercetin Phytosome • 250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
- 01509 Advanced Anti-Adipocyte Formula
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 02478 DHEA Complete
- 01738 Garcinia HCA
- 01908 Mediterranean Trim with Sinetrol™ -XPur
- 01432 Optimized Saffron
- 00818 Super CLA Blend with Sesame Lignans

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 01064 Femmenessence MacaPause®
- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01441 Progesta-Care®
- 01649 Super-Absorbable Soy Isoflavones

Turn Back

the Hands of Time



SUPER SALE PRICE

Item #02414

30 vegetarian capsules

1 bottle **\$10.13**

4 bottles \$9 each

Fisetin has a range of benefits that may increase lifespan. Most impressively, it's better than other plant compounds at clearing out senescent cells that are no longer functioning effectively. Our Bio-Fisetin formula is up to 25 times more bioavailable than other fisetin formulas—another way to reverse the clock!



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

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

More Nutrients
Higher Potencies

LIFE EXTENSION® TWO-PER-DAY MULTIVITAMIN

Compared to Centrum®
Two-Per-Day Provides:

- 50 times the VITAMIN B1
- 25 times the VITAMIN B6
- 12 times the VITAMIN B12
- 10 times the BIOTIN
- 10 times the SELENIUM
- 8 times the VITAMIN C
- 2.5 times the VITAMIN B3
- 2 times the VITAMIN D
- 3 times the VITAMIN E
- 2 times the ZINC



Two-Per-Day Multivitamin Tablets

SUPER SALE PRICE

Item #02315 • 120 tablets (two-month supply)
1 bottle \$15.53 • 4 bottles \$13.95 each

Two-Per-Day Multivitamin Capsules

SUPER SALE PRICE

Item #02314 • 120 capsules (two-month supply)
1 bottle \$16.20 • 4 bottles \$14.40 each

Each bottle provides a two-month supply.

For full product description and to order **Two-Per-Day Multivitamin**,
call **1-800-544-4440** or visit **www.Life Extension.com**



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IN THIS EDITION OF *LIFE EXTENSION MAGAZINE*®



24 RISKS OF SITTING TOO LONG

Americans spend more than half their waking time sitting, which can lead to **deep vein thrombosis**.

35 VINPOCETINE IMPROVES HEARING CAPACITY

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

40 NUTRIENTS THAT PROTECT AGAINST MEMORY LOSS

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

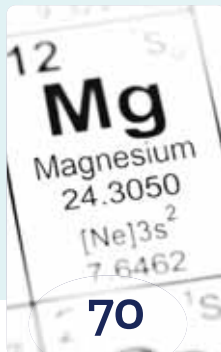


50 SAFE RELIEF FROM ACUTE PAIN

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

60 PROBIOTIC THAT LOWERS CHOLESTEROL

In a clinical trial, a unique **probiotic** *reduced* LDL by **12%** and total cholesterol by **9%** in nine weeks.



70 MAGNESIUM MITIGATES MIGRAINES

Magnesium combined with **riboflavin** and **CoQ10** helps prevent migraines and lessens their duration and severity.