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September 2023

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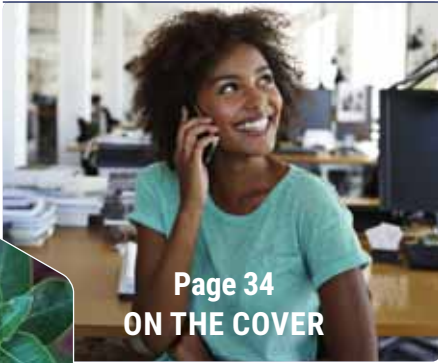
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# Tragic Errors!



WILLIAM FALOON

About **34,700** men in the U.S. perished from **metastatic prostate cancer** in **2022**.<sup>1</sup>

Many of the deaths can be attributed to the **U.S. Preventive Services Task Force** recommending *against PSA screening* in **2008** and **2012**.<sup>2</sup>

As we long ago predicted, the penalty for avoiding **PSA screening** is an upsurge in **metastatic** prostate cancers.<sup>3</sup>

A landmark study published by the **American Medical Association** confirms the absurdity of advising men to not undergo **PSA screening**.

From **2004** through **2010**, there were no statistically significant changes in the incidence rate of **meta-static** prostate cancer. Back then lots of men were having **PSA blood tests** to detect *early-stage* disease.<sup>2</sup>



Between **2010** and **2018** (after PSA screening declined) there was an approximate **41% increase** in **metastatic prostate cancer** incidence.<sup>2</sup>

This study also found *higher* **PSA** levels at diagnosis, suggesting a higher risk of more advanced disease occurring after the **U.S. Preventive Services Task Force** advised *against PSA screening*.

The authors of this **American Medical Association**-published study predict that these data may translate into even *higher* future incidences of **metastatic disease** and **deaths** caused by delayed diagnoses.

This **tragic error** is an example of government-funded “committees” making sweeping policy recommendations that do not apply to most readers of **Life Extension® Magazine**.

**Prostate cancer** is the second leading cause of cancer death in men.<sup>1</sup>

A low-cost **blood test** called **PSA** (prostate-specific antigen) is a screening tool to monitor prostate health.

This test can indicate when further diagnostics are necessary or prompt a man to initiate lifestyle changes that can reduce PSA levels.

Early detection is critical, because it helps to identify cancer in time for curative treatment to be initiated.<sup>4</sup>

What’s interesting is how quickly **PSA screening** declined after misguided policy statements were issued by the **U.S. Preventive Services Task Force**.

### Government-Funded Committees

The **United States Preventive Services Task Force** is a group funded by the federal government and private industry.<sup>5</sup>

In **2008**, the **United States Preventive Services Task Force** recommended that men over age **75** not have their blood routinely screened for **PSA**.<sup>6</sup>

In **2012**, the **United States Preventive Services Task Force** recommended against routine **PSA screening** for all men.<sup>7</sup>

These recommendations resulted in the media proclaiming that **PSA screening** should be halted.

My response was to write an article titled “**Federal Death Panels**,” published in the **May 2013** issue of **Life Extension® Magazine**.

### Fewer PSA Screenings = More Metastatic Disease

In men 45 to 74 years old, there was a nonsignificant decline in the incidence rate of metastatic prostate cancer from **2004 to 2010** followed by an approximately **41% increase** from **2010 to 2018**. For men aged 75 years and older, there was a significant decline in incidence of metastatic prostate cancer from **2004 through 2011** followed by an even steeper **43% increase**.<sup>2</sup>

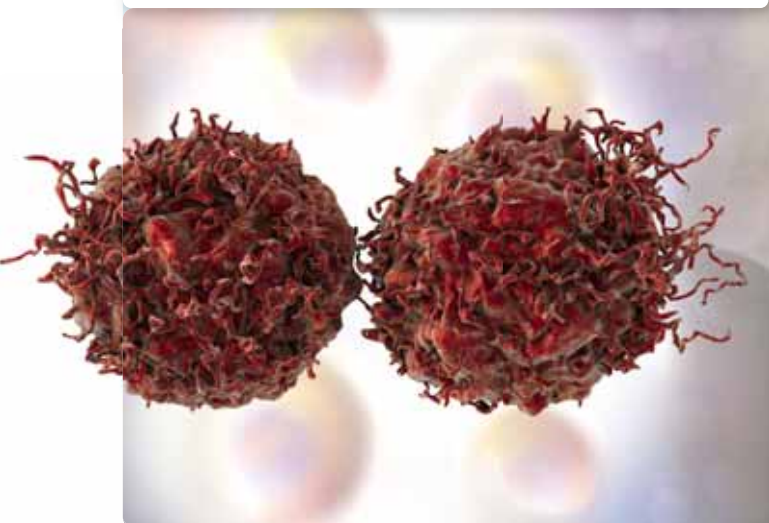
### Consequences of Reduced PSA Screening

The initial effect of the **United States Preventive Services Task Force** recommendations in **2008-2012** was a decline in prostate cancer **diagnoses**. This happened because as the number of **PSA tests** went down, so did new cases... at least in the beginning.

By the year **2016**, however, **11,387 more** American men were diagnosed with **metastatic prostate cancer** compared to **2008** levels, when **PSA blood test** prevalence was robust.<sup>10</sup>

In **2022**, the **American Medical Association** published a huge study that found by **2018**, about **12,300 more** men were being diagnosed with **metastatic prostate cancer** each year... **41%** of whom were aged 45-75 and **43%** were above 75 years.<sup>2</sup>

Interestingly, in a multicenter randomized **European** trial, that did not follow the **United States Preventive Services Task Force** (USPSTF) recommendations for PSA screening, participants were followed up for 13 years. It was found that there was a **21% reduction** in the risk of **prostate cancer** and a **27% reduction** in the risk of **prostate cancer mortality** in **PSA-screened** men.<sup>11</sup>





### UPDATE:

In **December 2022**, a widely publicized study found that **77%** of **prostate cancers** in America are detected by **PSA screening**.<sup>9</sup> This is a *higher* number of cancers caught in *early* stages than by mammography, colonoscopy, or PAP smears. Yet the **United States Preventive Services Task Force** still does not recommend universal **PSA screening** for all men over age 40.

Here are some stark conclusions from the **2022** study by the **American Medical Association**:

*“Our study of the recently released 2004 to 2018 SEER data set confirms a rising incidence rate of metastatic prostate cancer coinciding with the 2008 and 2012 USPSTF recommendations against PSA-based prostate cancer screening.*

*Although this increase was seen across all age groups, it was greater in men aged 75 years and older, as well as in non-Hispanic White men, and followed trends in PSA screening reduction.”<sup>2</sup>*

Those who chose to follow the **United States Preventive Services Task Force (USPSTF)** guidelines of **2008-2012** are now at *greater* risk for advanced-stage disease.

Few **metastatic prostate cancer** patients will be **cured**.<sup>12</sup> Some are kept alive by grueling **chemotherapy, radiation, and hormone-ablation** regimens.<sup>13</sup>

The needless suffering and deaths caused by this **tragic error** will likely go into the history books as an example of misinterpreting the use and value of a simple screening tool (PSA blood test) to detect and manage early-stage disease.

### Controlling PSA Levels

Detecting a rising PSA in *early* stages enables dietary, lifestyle, and other changes that can lower future **PSA** readings.<sup>18</sup>

**PSA** is more than a marker for **prostate disease**. Prostate cancer cells secrete abundant PSA that degrades healthy prostate tissues to make room for tumor expansion.<sup>19</sup>

We’ve published articles over the decades about how switching to a **Mediterranean diet** with emphasis on cutting back on red meat and dairy can reverse a rising PSA blood level.<sup>20-25</sup>

### Low-Cost Blood Tests

Record numbers of American men are battling metastatic prostate cancer, yet PSA screening is still underutilized.

**Life Extension**<sup>®</sup> long ago advocated that men over age 40 have an annual PSA test, along with measures of cardiovascular risk that can be neutralized if caught in early stages.

A **PSA** blood test costs **\$31**.

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William Faloon, Co-Founder  
**Life Extension**<sup>®</sup>

## History of PSA Testing

**PSA** was first identified in blood in **1979**.<sup>14</sup>

Doctors began using **PSA** as a diagnostic tool when treating prostate cancer patients in **1987**. The FDA approved **PSA testing** for this purpose in **1994**.<sup>15</sup>

As advocacy groups like **Life Extension** urged men to utilize **PSA** as a **screening tool**, tens of millions of American men began adding PSA to their annual list of **blood tests**.

The number of lives spared by *early* detection remains a hotly debated topic. One reason for the controversy is that typical aging men develop multiple chronic conditions that often kill before clinically relevant prostate cancer develops.

The unhealthy status of average older men does not apply to those who take proactive steps to safeguard their health, as increasing numbers of informed consumers are doing.



Of interest, late in **2017**, health authorities in **Mexico** published a **legally binding** national prostate cancer screening guideline stating that all Mexican men over age 45 should be **screened** using digital rectal examination and **PSA**. Men with a family history of prostate cancer should begin at age 40.<sup>16</sup>

In this instance, Mexico appears to be ahead of U.S. health officials in taking proactive steps to reduce the prostate cancer mortality of its citizens.

Before PSA testing was “approved” by the FDA, enlightened Americans would travel to Mexico or other countries to have a **PSA blood test** performed. It was considered controversial in those early days.

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# In the News



## Multivitamins Help Maintain Memory in Aging Individuals

Results from two clinical trials indicate that daily multivitamin supplementation can help prevent memory loss and slow cognitive decline among older individuals, the *American Journal of Clinical Nutrition* reported.\*

The COcoa Supplement and Multivitamin Outcomes Study (COSMOS), including (COSMOS-Web and COSMOS-Mind) evaluated the effects of multivitamin supplementation on cognitive function.

COSMOS-Mind found that compared to a placebo, supplementing with a daily multivitamin-mineral was associated with better scores for cognition and executive function, and less cognitive decline.

COSMOS-Web included 3,562 men and women who received a multivitamin supplement or a placebo daily for three years. Cognitive assessments were conducted at enrollment and yearly for the remainder of the trial. After one year, as well as on average during the three years of follow-up, participants who received **multivitamins** had better immediate recall compared with the **placebo** group.

**Editor's Note:** The researchers estimated that, "... the effect of the multivitamin intervention improved memory performance above placebo by the equivalent of 3.1 years of age-related memory change."

\* *Am J Clin Nutr.* 2023 May 24.

## Lower Folate-B12, Higher Homocysteine, and H.Pylori Linked with Erectile Dysfunction

A recent clinical study found that *H. pylori* infection may lead to decreased *absorption* of vitamin B 12 and folic acid. This led to increased homocysteine levels, which might be associated with erectile dysfunction (ED) in men.\*

Among other factors involved in erectile function, *higher* levels of serum homocysteine is associated with poor endothelial functioning which accelerates **atherosclerosis**.

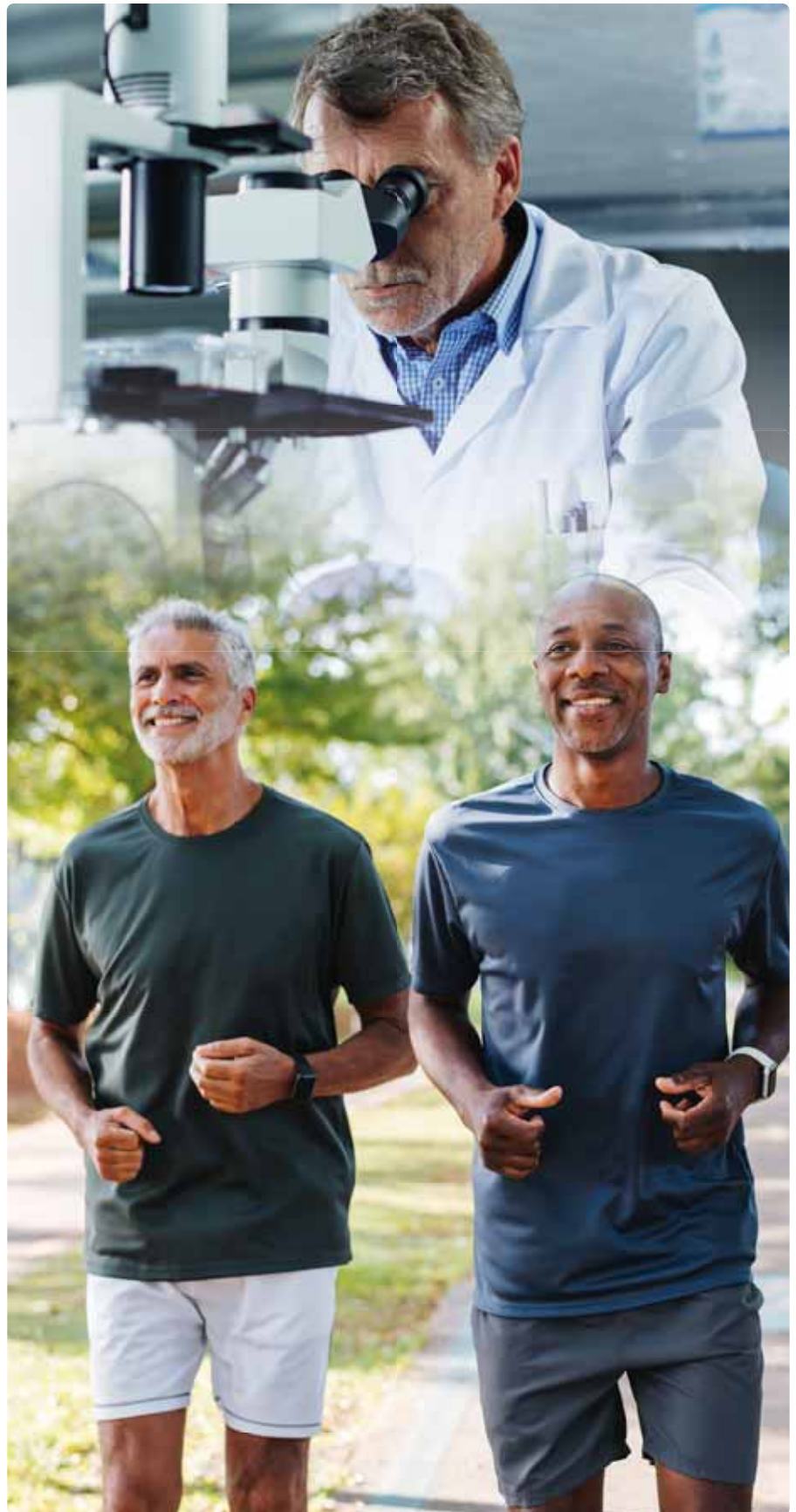
In this observational study, researchers investigated the relationship between homocysteine, folic acid, and vitamin B12.

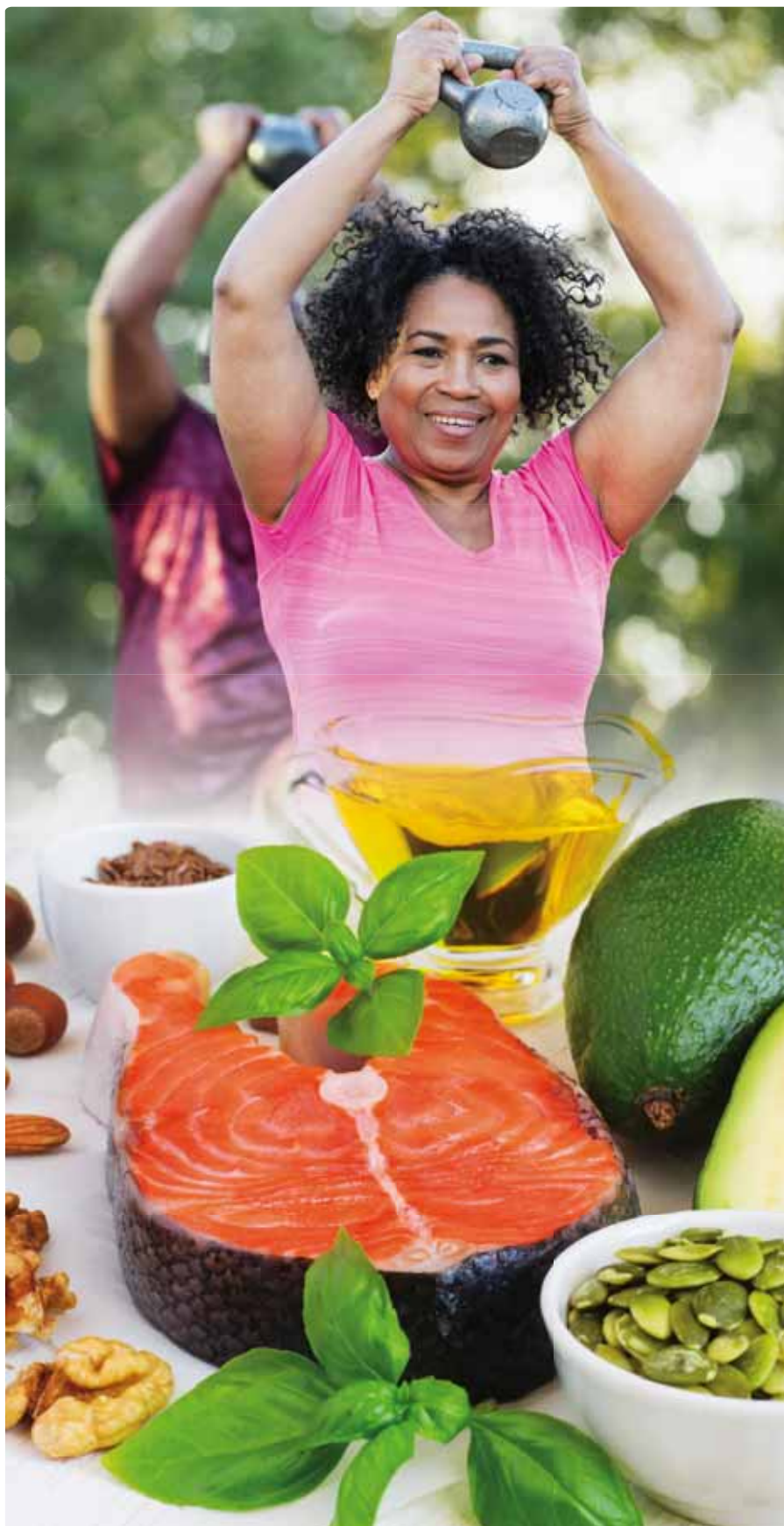
It was found that *H. pylori* antibodies were *higher* in men with ED as compared to healthy men.

The ED group also had significantly *higher* levels of **homocysteine** and *lower* levels of B vitamins as compared to healthy men.

**Editor's Note:** Researchers concluded that *H. pylori* infection eradication or folic acid and B12 supplementation might have certain clinical value in the treatment of vascular ED.

\* *Sex Med.* 2023 Mar 1;11(2):qfac018.





## Fish Oil Improves Body Composition, Strength, Performance in Older Individuals

A secondary analysis of findings from a clinical trial found improvements in body composition, muscle strength and physical performance among older men and women who consumed a supplement containing **fish oil** compared to a **placebo**.\*

The six-month trial included 200 people aged 60 and older. Participants were randomized to receive a **fish oil** supplement that provided **1,340 mg** of **EPA** and **1,007 mg** of **DHA** or a **placebo**.

After six months, there was a significant increase in thigh circumference among those who received fish oil, while waist and hip circumference remained relatively the same.

Total skeletal muscle mass, appendicular skeletal muscle mass, muscle strength (as evaluated by hand-grip strength measurement) and physical performance (demonstrated by the ability to rise from a chair and walk) also improved among fish oil-supplemented participants compared with the placebo group.

**Editor's Note:** The supplemented group additionally experienced a decrease in serum triglycerides and an increase in HDL cholesterol.

\* *Age Ageing*. 2022 Dec 5;51(12):afac274.

## Lower Vitamin C Levels Linked to Greater Health Risk for Diabetics

Low serum levels of vitamin C may put adults with pre-diabetes or diabetes at greater risk, a study showed.\*

The study analyzed data from 52,150 individuals who participated in NHANES from 1999–2018. Among the participants 6,827 had type II diabetes and 428 had type I diabetes. Data included fasting plasma glucose and A1c levels.

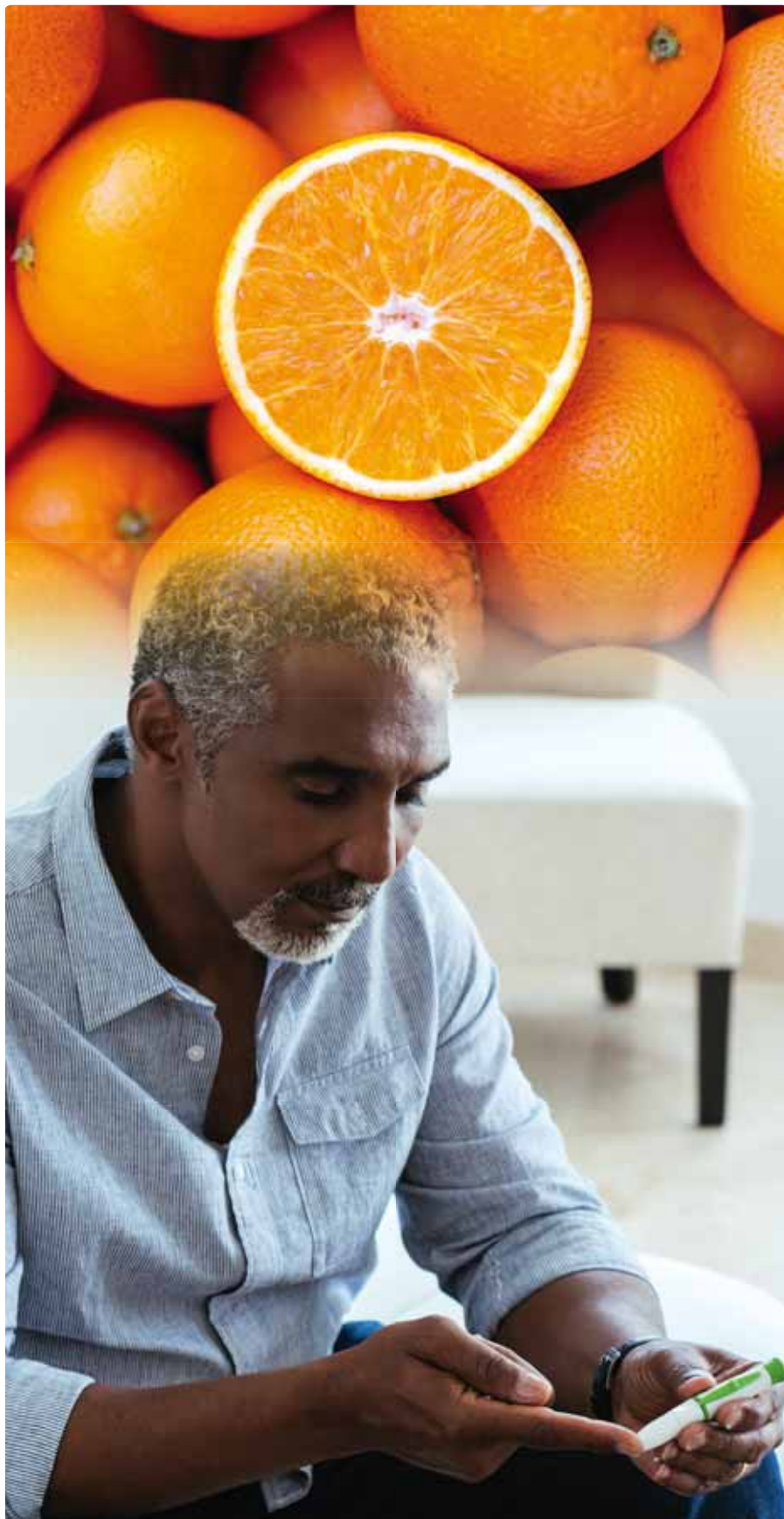
Those whose intake of vitamin C was lower than the estimated average requirement had a **20% higher** risk of type II diabetes compared with an intake above the estimated average requirement.

Those who did not use vitamin C supplements had a **28%** greater risk than supplement users.

Low and deficient serum vitamin C levels were associated with fewer years of life in comparison with normal levels.

**Editor's Note:** Not supplementing with vitamin C was associated with a **25%** greater mortality risk among people with type I diabetes, a **20%** greater risk among those with type II diabetes, and a **24%** greater risk among those without diabetes compared with those who supplemented.

\* *Nutrients*. 2022 Sep 21;14(19):3902.



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**Rick**

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References: 1. *Nutrients*. 2020 Nov 28;12(12).  
2. Synapharm - Company supplied data. 2021.

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<sup>o</sup>DEF (Dietary Folate Equivalents)

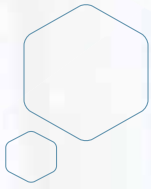
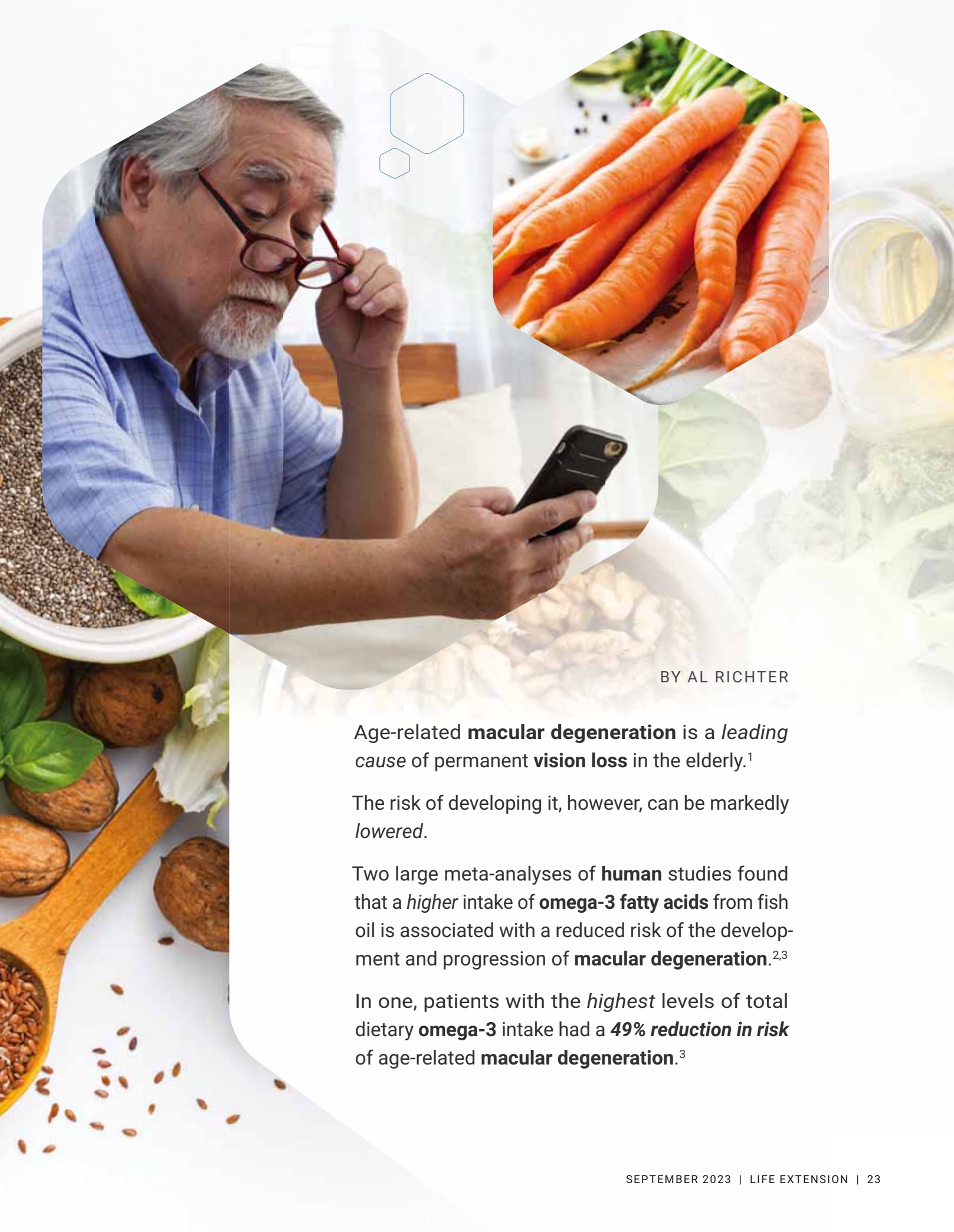
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# OMEGA-3S and Macular Degeneration Risk







BY AL RICHTER

Age-related **macular degeneration** is a *leading cause* of permanent **vision loss** in the elderly.<sup>1</sup>

The risk of developing it, however, can be markedly *lowered*.

Two large meta-analyses of **human** studies found that a *higher* intake of **omega-3 fatty acids** from fish oil is associated with a reduced risk of the development and progression of **macular degeneration**.<sup>2,3</sup>

In one, patients with the *highest* levels of total dietary **omega-3** intake had a **49% reduction in risk** of age-related **macular degeneration**.<sup>3</sup>

## The Two Types of Macular Degeneration

Age-related macular degeneration can be divided into two types:<sup>4</sup>

- **Dry** macular degeneration results when the cells of the macula grow thin and break down.
- **Wet** macular degeneration occurs when abnormal blood vessels beneath the retina grow and leak, damaging the macula.

The **wet form** tends to be much more severe and progressive. It is responsible for most of the cases that lead to **blindness**.

## How Fish Oil Protects Vision

**Age-related macular degeneration** is a disease of the **retina**, the layer of nerve cells at the back of the eye that detects light and sends signals to the brain to enable vision.

The **macula** is the part of the retina responsible for sharp, straight-ahead vision.

When these cells are damaged or lost, **visual acuity** (sharpness) declines. Basic tasks like driving and reading become impossible, and **blindness** can eventually result.<sup>1</sup>

Oxidative stress and inflammation drive the progression of macular degeneration.<sup>5</sup>

**Omega-3 fatty acids** from fish oil may protect eye health in a few ways.

For one, **omega-3s** are structural components of **cell membranes** in the maculae.<sup>6</sup> They have **anti-inflammatory**,<sup>6</sup> **neuroprotective**,<sup>7,8</sup> and other effects that mitigate the processes that lead to macular degeneration.<sup>9-11</sup>

The **retina** of the eye is an extension of the **optic nerve**, which extends directly from the brain.<sup>12</sup> Omega-3s help shield the retina from age-related degenerative changes that damage these cells.<sup>11,13,14</sup>

## Omega-3s and Macular Degeneration Risk

Several epidemiological studies have found that people with the *highest* intake of **omega-3 fatty acids** had the *lowest* risk of developing macular degeneration.<sup>10,15-20</sup> Observational studies have shown that increased dietary intake of omega-3 slows the progression of the disease.<sup>21</sup>

In **2021** and **2022**, the results of two large meta-analyses investigating this topic were published.<sup>2,3</sup>

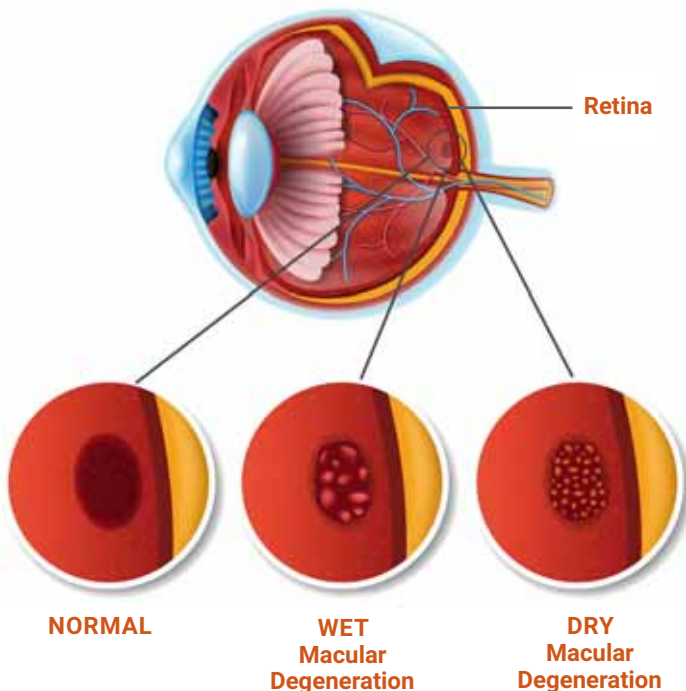
The first examined data from **21** separate human studies around the world from more than **190,000** individuals. It looked at whether intake of fish oil-derived **omega-3 fatty acids** was predictive of **age-related macular degeneration**.<sup>2</sup>

The results showed that those with the highest intake of fish oils had a **14% lower risk** of *early-stage* age-related macular degeneration and a **29% lower risk** of *late stage* (more severe) macular degeneration.<sup>2</sup>

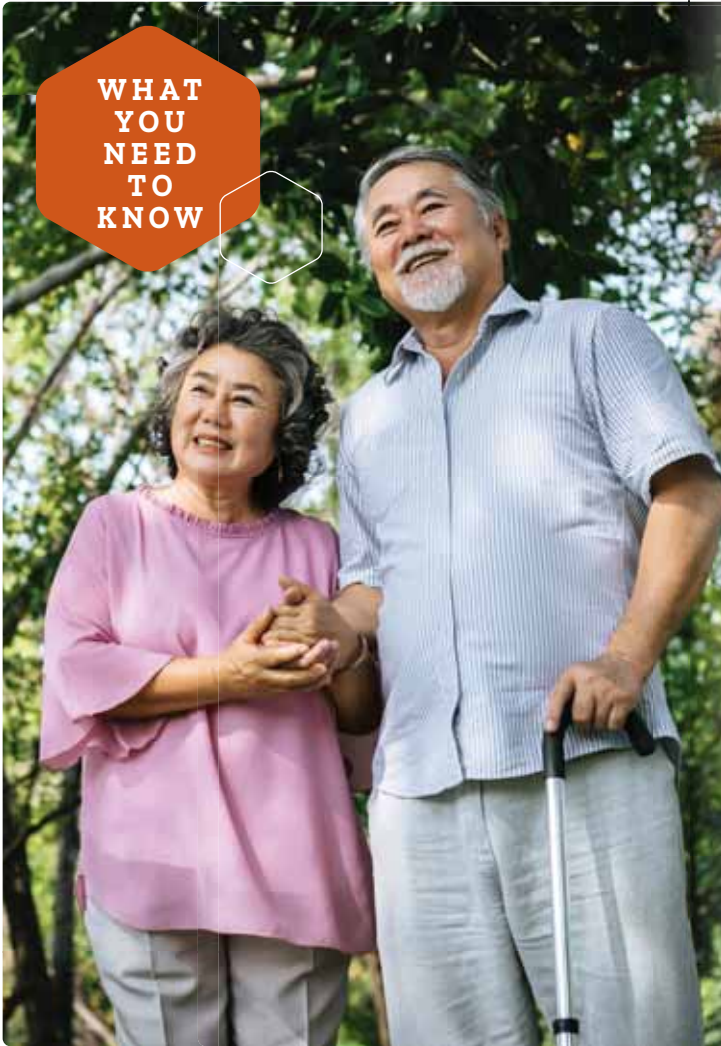
Further analysis found that for each additional **1,000 mg** of **omega-3** intake per day, the risk for early macular degeneration was lowered by **6%**, and the risk for late macular degeneration was reduced by **22%**.<sup>2</sup>

The researchers also explored whether there was any difference between the two primary fatty acids found in fish oils, **DHA** and **EPA**. They found that *both* DHA and EPA, when analyzed alone, were protective in individuals with the highest intake.<sup>2</sup>

### MACULAR DEGENERATION



WHAT  
YOU  
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TO  
KNOW



### Omega-3s and 'Wet' AMD

The other meta-analysis, published in **2022**, specifically evaluated patients with **wet age-related macular degeneration**.<sup>3</sup> It included data from five studies performed in Japan, the United States, and Europe, in over **12,000** patients.<sup>3</sup>

Even for this more aggressive type of **macular degeneration**, the analysis found that intake of fish oil-derived omega-3 fatty acids was significantly associated with a **reduced risk**.<sup>3</sup>

Patients with the highest levels of total dietary omega-3 intake had a remarkable **49% reduction in risk** for wet **macular degeneration**, compared to those with the lowest intake.<sup>3</sup>

Studies in the meta-analysis reported a significant correlation between **total intake** of omega-3 fatty acids and risk for this blinding form of macular degeneration.<sup>3</sup>

## Protect Against Vision Loss

- Age-related **macular degeneration** is the most common cause of permanent vision loss in older individuals.
- Two large meta-analyses including hundreds of thousands of subjects show that *higher intake* of **omega-3 fatty acids** from fish oil is associated with *lower risk* for the development and progression of macular degeneration.
- Each of the primary fish oil omega-3s, **DHA and EPA**, protects against age-related macular degeneration.

This study also separated DHA and EPA to see if they differed in their protective ability. Both were found to be protective, with the highest consumption of **DHA** predicting a **39%** lower risk of wet macular degeneration and the highest consumption of **EPA** predicting a **32%** lower risk.<sup>3</sup>

These analyses provide evidence that **fish oil** can help protect against macular degeneration and promote eye health.

### Summary

**Age-related macular degeneration** is the most common cause of vision loss in those over 50 years of age.

Two large meta-analyses confirm that a *higher* intake of **omega-3 fatty acids** from fish oil is protective against the development and progression of all forms of age-related macular degeneration. •

### Carotenoids Also Protect the Retina

Omega-3 fatty acids aren't the only nutrients that have been found to be protective against eye disease.

**Carotenoid** pigments found in plants, such as **lutein**, **zeaxanthin**, and **meso-zeaxanthin** are known to concentrate in the outer membrane of the retina, where they provide structure support to the maculae and shield these delicate cells from harmful wavelengths of light that can damage the eye.

Population studies show that individuals with the *highest* concentration of carotenoids in the retina have *lower* rates of **macular degeneration**.<sup>22,23</sup>

In one study, those with the highest intake of **lutein** and **zeaxanthin** had a **41% lower risk** of developing advanced macular degeneration.<sup>24</sup>

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

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## There are two types of AMD:<sup>4</sup>

### Dry AMD:

- Most common (also called atrophic AMD),
- The macula gets thinner with age,
- Three stages: early, intermediate, and late,
- Usually progresses slowly over several years, and
- There are no medical treatment options available for late, dry AMD.

### Wet AMD

- Less common (also called advanced neovascular AMD),
- It happens when abnormal blood vessels grow in the back of the eye and damage the macula,
- Usually causes faster vision loss. Any stage of dry AMD can turn into wet AMD—but wet AMD is always late stage, and
- Medical treatment options are available for wet AMD.

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Liposomal-Hydrogel™

# C VITAMIN



"I feel better about my immune system with it."

**Mary**

VERIFIED CUSTOMER REVIEW

Item #02501 • 60 vegetarian tablets  
1 bottle \$25.50 • 4 bottles \$23 each



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

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

It also maintains *higher* vitamin levels throughout the day.<sup>1</sup>

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

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

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# Top Rated Multivitamin by Consumer Labs

**More Nutrients than Leading Brands\***



- 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
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## Two-Per-Day Multivitamin Tablets

Item #02315 • 120 tablets (two-month supply)  
**1 bottle \$18.38 • 4 bottles \$16.25 each**

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Item #02314 • 120 capsules (two-month supply)  
**1 bottle \$19.13 • 4 bottles \$17 each**

Each bottle provides a two-month supply.

“Covers all the bases.”

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 VERIFIED  
 CUSTOMER  
 REVIEW

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\*2023 Consumer Satisfaction, Rated #1 Catalog/Internet Merchant. Ratings based on results of the 2023 ConsumerLab.com Survey of Supplement Users. More information at [www.consumerlab.com/survey](http://www.consumerlab.com/survey).

\* Compared to CENTRUM Silver Adults 50\*

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

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**Super Omega-3** provides components found in **Mediterranean diets**, including **sesame lignans** to enhance the health benefits of fish oil.



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

Item #01988 • 120 softgels  
1 bottle **\$38.25**  
4 bottles \$34 each



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

Item #01982 • 120 softgels  
1 bottle **\$28.50**  
4 bottles \$26.50 each

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For full product description and to order **Super Omega-3**, or **Super Omega-3 Plus**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



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

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**Donna**

VERIFIED CUSTOMER  
REVIEW

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Delivery System**



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200 mg CoQ10

Item #01431 • 200 mg, 30 softgels

1 bottle **\$45**

4 bottles \$38.50 each



100 mg CoQ10 + 10 mg PQQ

Item #01733 • 100 mg, 30 softgels

1 bottle **\$38.25**

4 bottles \$31 each

**#1 Rated CoQ10 Products - 5 Time Winner!\***



For full product description and to order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™**, or **Super Ubiquinol CoQ10 with PQQ**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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# Comprehensive EYE HEALTH Formula

## MacuGuard® Ocular Support provides:

- > **Lutein, trans-zeaxanthin, and meso-zeaxanthin** help maintain structural integrity of the **macula and retina**.<sup>1-5</sup>
- > **Saffron** has been shown to help support **vision** as demonstrated by doctors' eye exams.<sup>1</sup>
- > **Alpha-carotene** further helps support **macular density**.<sup>1</sup>



**MacuGuard® Ocular Support  
with Saffron + Astaxanthin**

Item #01993 • 60 softgels

1 bottle \$32.25 • 4 bottles \$29 each



**MacuGuard® Ocular Support  
with Saffron**

Item #01992 • 60 softgels

1 bottle \$18 • 2 bottles \$17 each

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

### References

1. *JAMA Ophthalmol.* 2015;133(12):1415-24.
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4. *Free Radic Biol Med.* 2012;53(6):1298-307.
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(Each bottle lasts for **two** months.)

MacuGuard® Ocular Support is available with or without astaxanthin.

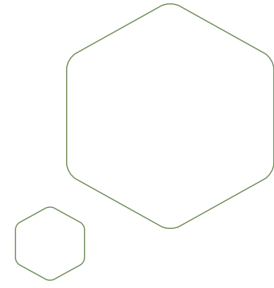
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# Reduce Stress While Sharpening **MENTAL FOCUS**

**ASHWAGANDHA**

SPEARMINT



BY MICHAEL DOWNEY

A **2022** survey found that **27%** of Americans reported being so **stressed** most days that they can't **function**.<sup>1</sup>

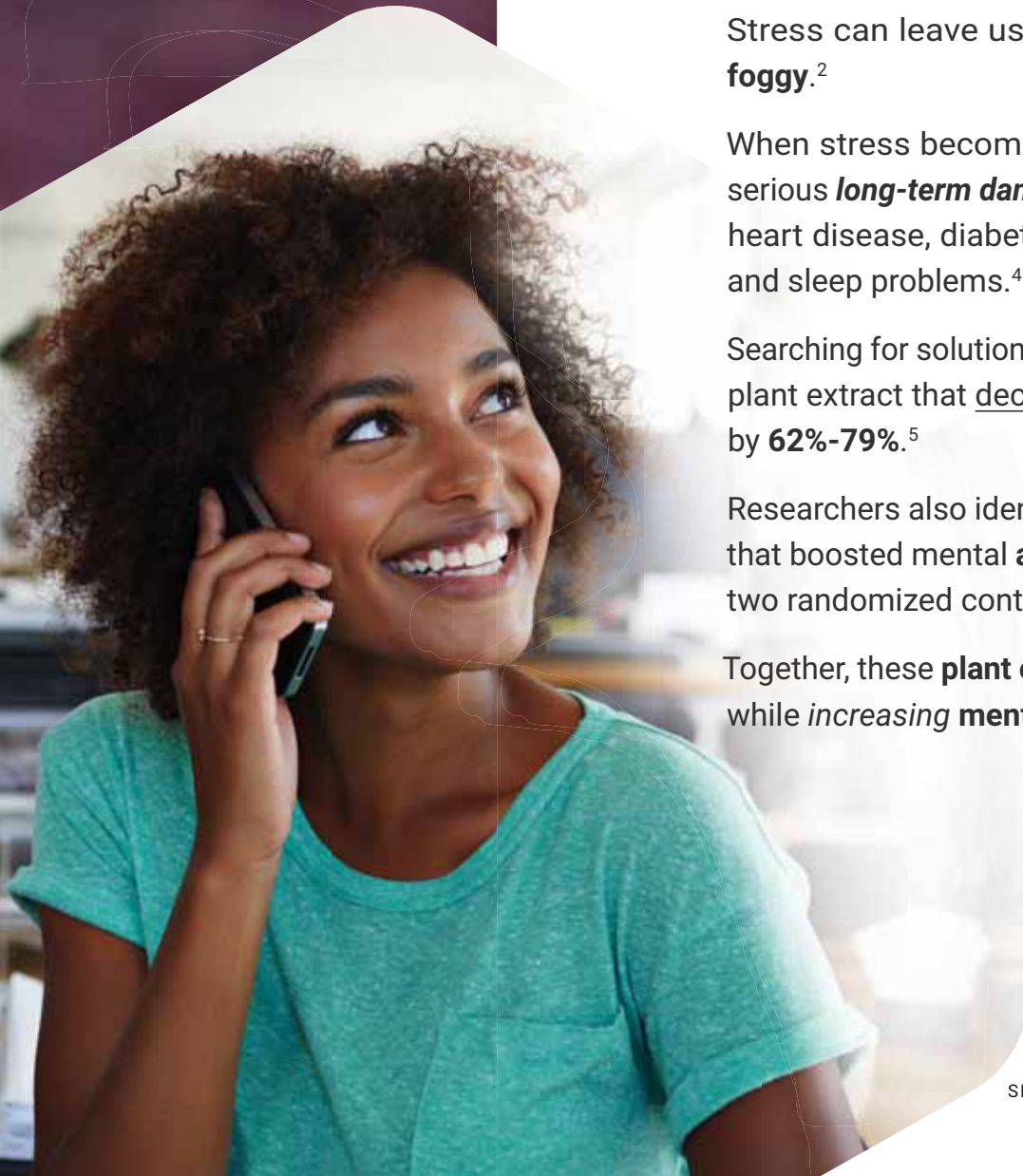
Stress can leave us mentally lethargic and **foggy**.<sup>2</sup>

When stress becomes **chronic**, it can cause serious **long-term damage** and increase risk for heart disease, diabetes, depression, anxiety,<sup>3</sup> and sleep problems.<sup>4</sup>

Searching for solutions, researchers identified a plant extract that decreased feelings of **stress** by **62%-79%**.<sup>5</sup>

Researchers also identified a *spearmint extract* that boosted mental **alertness** and **attention** in two randomized controlled human studies.<sup>6,7</sup>

Together, these **plant extracts** may *lower stress* while *increasing mental focus*.



## The Dangers of Stress

**Chronic stress** inflicts damage throughout the body.<sup>8</sup>

Untreated, stress can increase risk for:

- Heart disease and stroke,<sup>9,10</sup>
- Obesity,<sup>11</sup>
- Diabetes,<sup>12</sup>
- Osteoporosis,<sup>13</sup>
- Gastrointestinal complaints,<sup>10</sup>
- Mental health, including anxiety, depression,<sup>3</sup> and insomnia,<sup>4</sup> and
- Sexual dysfunction.<sup>14</sup>

One way the body responds to stress is by releasing **cortisol**, a hormone that keeps the stress response **activated** during chronic periods of stress.<sup>15</sup>

Research shows that an extract of the **ashwagandha** plant helps the body fight the negative effects of chronic stress.<sup>5,16</sup>



## Ashwagandha Lowers Cortisol

**Ashwagandha** has been used in traditional Indian medicine for over **3,000 years** to promote whole-body health.<sup>16,17</sup>

Chronic stress results in higher levels of **cortisol**, a hormone that helps regulate stress response. Chronically elevated cortisol levels can impact overall quality of life.<sup>15</sup>

Cortisol is regulated by the hypothalamic-pituitary-adrenal (HPA) axis. Normal activation of the HPA axis is necessary for a healthy response to stress. However, **chronic** stimulation of the HPA axis can lead to an erratic stress response. This can result in constant levels of **cortisol** being released into the body contributing to weight gain, heart disease, impaired memory, and other health problems.<sup>18</sup>

Ashwagandha acts as an **adaptogen**, a substance helping the body deal with physical manifestations of stress, like the release of **cortisol**, while restoring balance.<sup>19</sup>

Research suggests that ashwagandha *inhibits* **cortisol** release.<sup>5,20,21</sup>

## Impressive Clinical Results

To validate these effects, scientists designed a randomized, placebo-controlled clinical trial.<sup>5</sup>

They divided **chronically stressed** individuals into four groups.

One group took a **placebo** while the other three took **ashwagandha** root and leaf extract in one of three doses:

- **125 mg** *once* daily,
- **125 mg** *twice* daily (total **250 mg**), or
- **250 mg** *twice* daily (total **500 mg**).

A commonly-used anxiety scale showed that overall **stress** was decreased by **71%** in the group that was given **125 mg** of extract *twice* daily (**250 mg** total) for 60 days.<sup>5</sup>

After **60 days**, the **125 mg** *twice* daily (**250 mg** total) group had significantly decreased:<sup>5</sup>

- Serum **cortisol**,
- Serum **C-reactive protein**, a marker of inflammation,
- Pulse rate, and
- Blood pressure.

WHAT YOU NEED TO KNOW



## Lower Stress, Boost Alertness

- **Stress** can have devastating impacts on emotional and physical health.
- In a clinical trial, **ashwagandha** extract lowered stress by **71%** and reduced levels of the stress hormone cortisol by **24.2%**.
- Stress can also lead to feelings of mental **fogginess**.
- A patented **spearmint** extract has been clinically shown to *improve* attention, alertness, and reaction times.
- Taken together, these two plant extracts may lower stress and boost mental focus.

All participants taking **ashwagandha**, compared to **placebo**, reported reduced feelings of **stress** and **anxiety** and significant improvements in:<sup>5</sup>

- Fatigue,
- Appetite loss,
- Feelings of “impending doom,”
- Inability to concentrate,
- Irritability,
- Forgetfulness, and
- Sleeplessness.

In the **125 mg** twice daily (**250 mg** total) group, serum **cortisol** decreased by **24.2%**.

### Boosting Mental Alertness

Stress can make people feel mentally muddled. Often times, treatments for stress reduce alertness and induce drowsiness.<sup>22</sup>

Researchers turned to **spearmint**, which has been used traditionally to improve **alertness** and **memory**.<sup>23</sup>

They found a spearmint extract that uses a water process extraction method to preserve the high polyphenol content in this herb.

This polyphenol-rich **spearmint extract**<sup>23</sup> contains a minimum of **14.5% rosmarinic acid** and a combination of **24% total polyphenols** that was shown to:

- Increase **alertness** and vigor,<sup>23</sup> and
- Improve working and spatial working memory, two aspects of **short-term memory**.<sup>23</sup>

In this human study, subjects with age-associated memory impairment who took **900 mg** of this specific **spearmint** extract for **90 days** had, compared to a placebo, a roughly **15%** improvement in working memory and a **9%** improvement in spatial working memory. This suggests **enhanced mental alertness**.<sup>23</sup>

In an open-label pilot trial, healthy adults taking **900 mg** of **spearmint** significantly improved their attention and concentration just **2.25 hours** after a single dose, demonstrating *swift* cognitive benefits.<sup>24</sup>

### Clinically Validating Spearmint

To elaborate on these findings, scientists conducted two randomized, placebo-controlled trials.<sup>6,7</sup>

In one study, healthy, active individuals aged 18-50 years took **900 mg** of **spearmint** extract or a placebo daily.

Volunteers were tested using a high-tech, 360-degree platform surrounded by towers with multiple lights. Subjects had to lunge to make hand or foot contact with targets on the towers as software counted the “hits.”<sup>7</sup>

This test measures reaction times when sudden changes in direction or speed are needed. It also measures choice reaction times—an indicator of the cognitive, more than the physical, aspects of reactive agility.

Those taking the **spearmint** extract had significant improvements in “hits” after just **30 days**, showing **enhanced mental agility**.<sup>7</sup>

### Improvements in Attention

Another placebo-controlled trial enlisted healthy, active volunteers aged 18–50 who took **900 mg** of **spearmint** extract or a placebo daily.<sup>6</sup>

This time, cognition was assessed by computerized **cognitive tests**.

After 30 days, the **spearmint** group had an **8.8%** increase in **sustained attention** as compared to placebo. After 90 days, **11%** improvement was reported.<sup>6</sup>

No significant changes in sleep, mood, or quality of life were found, demonstrating that this spearmint extract does not disrupt these aspects of life.<sup>6</sup>

Combining this **spearmint** extract with **ashwagandha** may help reduce stress and increase alertness, with no potential side effects.

### Summary

**Stress** reduces quality of life and increases risk of chronic disease.

In clinical trials, **ashwagandha** lowered feelings of stress and reduced cortisol levels.

Mental **fogginess**, which may be stress-related, can impair cognition.

A water-processed **spearmint** extract improved reaction time, alertness, and sustained attention in clinical studies. ●

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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# Essential Youth with L-Ergothioneine

The 'Longevity'  
Amino Acid



**L-ergothioneine** is an amino acid found in **mushrooms**.

Cell-based studies suggest that **L-ergothioneine** may support healthy longevity by:

- Protecting **mitochondrial DNA** function<sup>1</sup>
- Delaying **telomere** shortening<sup>2</sup>
- Supporting **DNA function** in cells subjected to UV exposure<sup>3</sup>

One daily capsule of **Essential Youth** provides **5 mg** of **L-ergothioneine**.

One daily capsule provides as much **L-ergothioneine** as 2 to 5 cups of white button mushrooms.<sup>4,5</sup>

#### References

1. *Cell Death Differ.* 2010 Jul;17(7):1134-40.
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Item #02431 • 30 vegetarian capsules

1 bottle **\$19.50**

4 bottles \$17.50 each



For full product description and to order  
**Essential Youth L-Ergothioneine**, call

**1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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Maintaining youthful DHEA levels can help support immune function, circulatory health, mood, libido, and more.

DHEA Complete delivers 7-Keto<sup>®</sup> DHEA (100 mg) and regular DHEA (25 mg), plus extracts from curcumin, green tea, and whole red grapes.

**Caution:** Consult a physician or licensed qualified health care professional before using this product if you have, or have a family history of breast cancer, prostate cancer, or other hormone-sensitive diseases.



Item #02478  
60 vegetarian capsules  
Two-month supply  
1 bottle **\$36**  
4 bottles \$32 each



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

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

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

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



Item #02107

60 250 mg vegetarian capsules

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"I love that it's  
extend release."

**Carol**

VERIFIED CUSTOMER  
REVIEW

For full product description and  
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**#1 Rated  
Magnesium  
Products\***

**CAUTION:** If taken in high doses,  
magnesium may have a laxative  
effect. If this occurs, divide  
dosing, reduce intake, or  
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"NAC is a powerful tool."

**Maury**

VERIFIED CUSTOMER REVIEW

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

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

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Item #01534 • 60 capsules

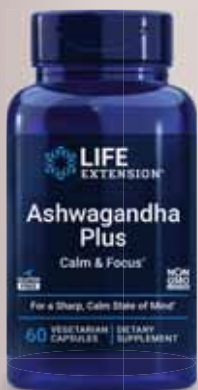
1 bottle \$12

4 bottles \$10.75 each

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In times of stress...  
**STAY CALM AND ALERT!**



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  2. *J Altern Complement Med.* 2018 Jan;24(1):37-47.
  3. *J Int Soc Sports Nutr.* 2018 Dec 12;15(1):58.
  4. *Nutr Res.* 2019 Apr;64:24-38.
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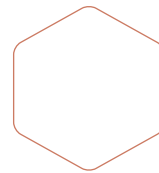
# Protect Against Occlusive Arterial Plaque



PINE BARK



CENTELLA ASIATICA



BY MICHAEL DOWNEY

**Atherosclerosis** can lead to heart attacks and strokes...the top *causes of death* worldwide.<sup>1</sup>

Two **plant extracts** have been shown to inhibit the development and worsening of **atherosclerosis** and to reduce **unstable** plaque, the most dangerous form.

Placebo-controlled clinical studies reveal that when these extracts are combined, they work better than separately.

In one study, participants taking the two extracts experienced **95% less progression** of plaque, compared to a control group receiving standard care.<sup>2</sup>

Another study showed the extract blend led to an **82% reduction** in major cardiovascular events, including **heart attack** and **stroke**.<sup>3</sup>

## Arterial Plaque

**Atherosclerosis** is a chronic, inflammatory vascular disease that involves plaque buildup on the inner walls of arteries, narrowing the opening and making the arteries stiff and inflexible.<sup>4</sup>

These plaques can be unstable and rupture.<sup>5</sup>

Atherosclerosis initiates and progresses for *decades* before symptoms develop.<sup>4,5</sup> Conventional **risk factors** include:<sup>6</sup>

- Aging,
- Family history of cardiovascular disease,
- Abnormal lipid levels, including elevated LDL (“bad”) cholesterol, high triglycerides, and low HDL (“good”) cholesterol,
- High blood pressure,
- Elevated blood sugar,
- Obesity and sedentary lifestyle,
- Poor diet, and
- Smoking.

The process of plaque formation involves inflammation, necrosis, fibrosis, and calcification.<sup>7</sup>

When atherosclerotic plaques rupture, or when a blood clot (thrombus) forms on jagged plaque, the result can be catastrophic arterial occlusions. These blockages, either partial or complete, can cause a **heart attack** or an ischemic **stroke**.<sup>8</sup>

Two plant extracts have been shown to *inhibit* atherosclerosis: ***Centella asiatica*** and **French maritime pine bark**.

## *Centella Asiatica*

***Centella asiatica*** (also known as **gotu kola**) is a plant native to Asia. It has long been used in traditional medicine for various disorders and wound treatment.<sup>9</sup>

*Centella* contains compounds called **triterpenes**, which are believed to inhibit plaque by their anti-inflammatory activity.<sup>10</sup> Triterpenes also stabilize more dangerous **soft plaque** by improving the synthesis of **collagen**,<sup>10-13</sup> which holds soft plaque in place.<sup>11,14,15</sup>

*Centella* also reduces the adhesion of **monocytes**, immune cells that promote atherosclerosis.<sup>15,16</sup>

In a clinical study of patients with soft plaque, taking **60 mg** of *Centella asiatica* extract three times daily for 12 months resulted in no increase in plaque size, compared to a **23% increase** in a **placebo** group.<sup>11</sup>

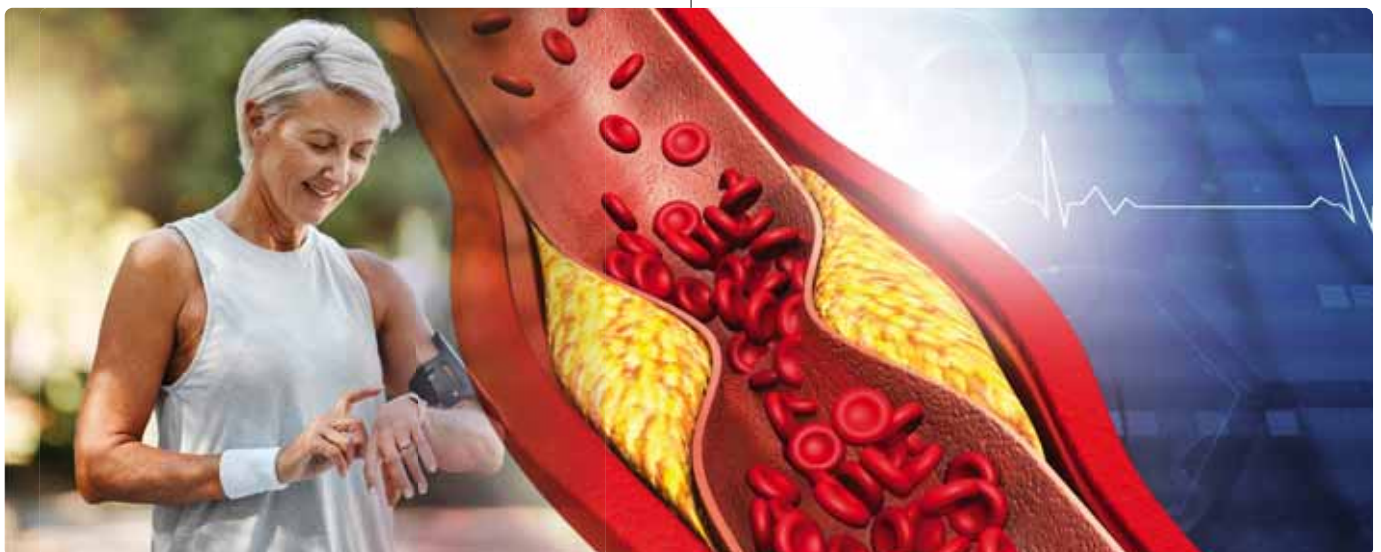
The extract also produced a **63% more firm** plaque, which is associated with less rupture risk.<sup>11</sup>

## Pine Bark

**French maritime pine bark** contains compounds known as **procyanidins** and **phenolic acids**.<sup>17,18</sup>

In multiple clinical studies, these compounds have been shown to slow atherosclerosis progression,<sup>18</sup> an effect that may result, in part, from reduced expression of inflammatory signaling molecules that contribute to plaque formation.<sup>19,20</sup>

In a clinical study of patients with coronary artery disease, those taking **200 mg** of **French maritime pine bark** extract daily for eight weeks had increased **flow-mediated dilation** (a measure of beneficial arterial widening) by **32%**. There were *no* significant changes in the **placebo** group.<sup>21</sup>





WHAT  
YOU  
NEED  
TO  
KNOWReduce Heart Attack  
and Stroke Risk

- **Atherosclerosis**, plaque in the arteries, frequently leads to strokes or heart attacks. It is the leading cause of death worldwide.
- Extracts of **French maritime pine bark** and ***Centella asiatica*** safely target this dangerous condition.
- Clinical studies show that, taken *together*, these extracts slow, and even **reverse** plaque accumulation, while boosting the stability of dangerous soft plaque to help prevent a deadly rupture.
- In a clinical study, this dual extract blend led to **7.4 times** lower progression of the disease.

## Combined Effects

The effects of these extracts were even more impressive when they were combined.

In one clinical study, individuals aged 45 to 60 whose plaques were a relatively *mild class IV* all received diet and lifestyle counseling. Participants were also randomized into six groups to receive either:

- **Lifestyle counseling**,
- **Lifestyle counseling plus 100 mg of aspirin**,
- **Lifestyle counseling plus 50 mg of standardized French maritime pine bark**,
- **Lifestyle counseling plus 100 mg of standardized French maritime pine bark**,
- **Lifestyle counseling plus 100 mg standardized French maritime pine bark with 100 mg aspirin**, or
- **Lifestyle counseling plus 100 mg of French maritime pine bark extract with 100 mg of *Centella asiatica* extract**.

The percentage of plaques that worsened to **class V**, blocking **more than 50%** of an artery, was:<sup>22</sup>

- **21.3%** in those receiving only lifestyle and diet counseling, but only
- **1.1%** in those receiving the dual extracts (**pine bark + *Centella asiatica***).

Scientists gave the same dosages to a group of patients with **class V** plaques (more than **50%** blockage of at least one major artery). After 42 months, the percentage of subjects whose plaques progressed to **class VI**, which involves **symptoms** such as numbness, tingling, or chest pain, was:<sup>22</sup>

- **48.0%** in those who received lifestyle counseling only, and
- **6.5%** in subjects receiving pine bark and *Centella asiatica*.

The extract blend led to **7.4 times** lower progression of the disease over the study period of 42 months. In addition, cardiovascular events (hospitalization, chest pain, heart attack, or stroke) occurred in **4.4%** of the combination extract group, as compared to **16%** in the standard care group.<sup>22</sup>

## Additional Clinical Validation

In two more clinical trials, scientists used a combination of **150 mg of French maritime pine bark** extract and **450 mg of *Centella asiatica*** extract daily, along with **100 mg of aspirin**, which is often recommended for those with atherosclerosis.<sup>3,23</sup>

In one of these studies, patients with atherosclerotic plaque were monitored for three years. All subjects received standard diet, lifestyle, and exercise counseling. A control group received no additional treatment, a second group was given *only aspirin*, and a third received **aspirin plus the dual-extract blend**.<sup>3</sup>

Plaque progression was observed in **5.3%** of those in the **dual-extract** group, but it was found in **over 20%** of the two groups that did not receive the extracts. Major **cardiovascular events** (such as heart attack or stroke requiring hospitalization), occurred in:<sup>3</sup>

- **22%** of the control group, but
- Less than **4%** of those taking the extracts and aspirin.

Another study investigated **calcification** of coronary arteries. Participants were randomized into three groups to receive either:

- Standard counseling and **100 mg** of aspirin daily,
- Standard counseling with **150 mg** of French pine bark extract, or
- Standard counseling with **150 mg** of French pine bark and **450 mg** of *Centella* extract daily.<sup>23</sup>



After 12 months, the number of calcifications:<sup>23</sup>

- **Increased** by **35%** in those receiving counseling and aspirin, but
- **Decreased** by **10%** in those taking **150 mg** of French pine bark and **450 mg** of *Centella* extract.

## Enhanced Plaque Stability

Some plaques are worse than others.

In a six-month clinical study of patients with **atherosclerotic plaques**, mild hypertension, and elevated cholesterol, subjects were divided into a lifestyle counseling group, a group that received the two herbal extracts, and a group that received both. Ultrasound imaging was used to assess plaque stability.<sup>24</sup>

In patients receiving only lifestyle counseling, plaque stability did not change significantly over six months.

But in patients receiving **150 mg of French maritime pine bark** extract and **450 mg of *Centella asiatica*** extract daily, the plaque stability index **doubled**. This means their plaques were *less* likely to rupture and induce catastrophic clotting.<sup>24</sup>

Plaque size and number also **decreased** significantly in treated individuals.

## Summary

**Plaque** accumulation in arteries is the signature characteristic of atherosclerosis, the underlying cause of most heart attacks and strokes.

Scientists have identified **two** plant extracts that target atherosclerosis and its consequences.

A blend of **French maritime pine bark** and ***Centella asiatica*** extracts has been shown to slow plaque growth, while boosting stability of deadly soft plaque, to help prevent a rupture.

This dual extract blend reduced progression of arterial plaque by as much as **95%** in a clinical study.

When used together, these extracts have been shown to help slow the development and progression of atherosclerosis, when combined with therapeutic lifestyle modification. •

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

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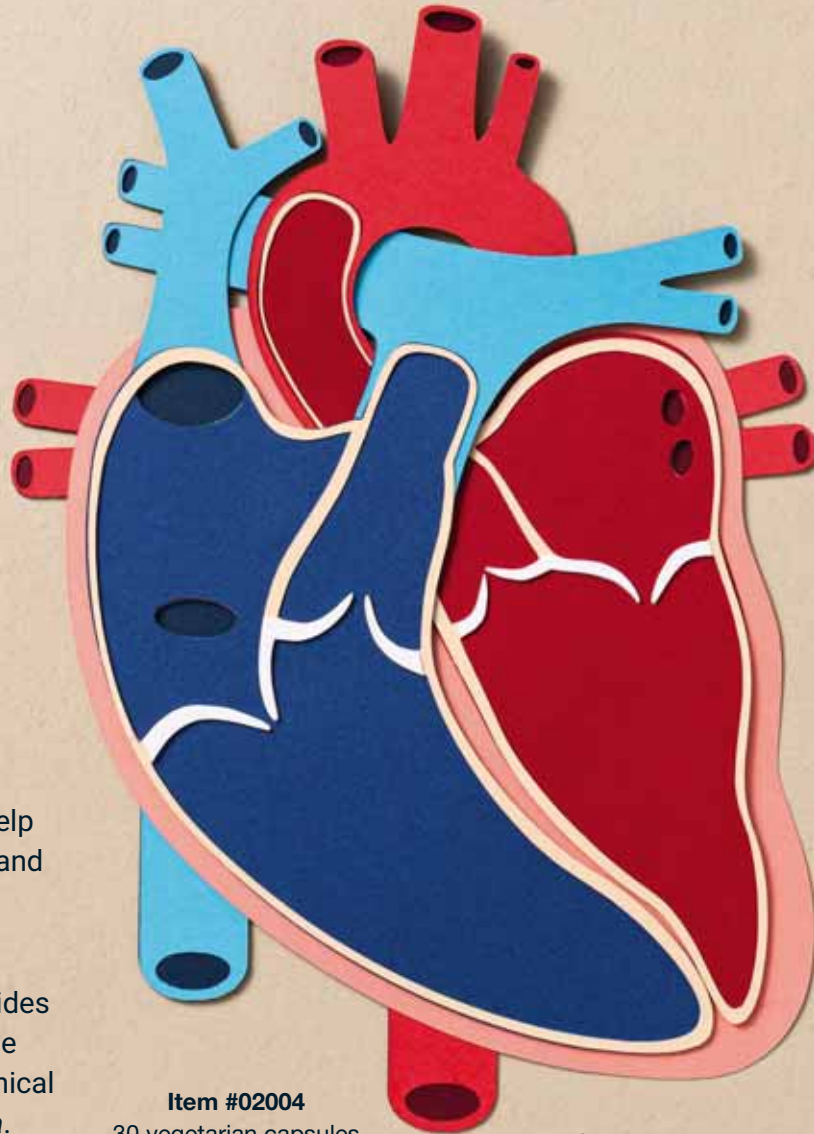
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\* *Int Angiol.* 2014 Feb;33(1):20-6.

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Impact of  
**NAD<sup>+</sup>**  
on HEALTHY  
LONGEVITY







BY STEVEN LAWRENCE

**NAD<sup>+</sup>** is found in *every living cell*, from bacteria to **humans**.<sup>1</sup>

It is required for many reactions that provide **energy** and for essential processes such as repairing **DNA**.<sup>2-4</sup>

The problem is that levels of NAD<sup>+</sup> decline as we age.<sup>5</sup>

A nutrient called **nicotinamide riboside** has been shown to boost cellular NAD<sup>+</sup>.

Preclinical studies show that this could support brain,<sup>6-8</sup> heart,<sup>8</sup> and metabolic health.<sup>8-10</sup>

In organisms ranging from yeast to worms to mice, replenishing **NAD<sup>+</sup>** with **nicotinamide riboside** has been found to extend lifespan.<sup>11-14</sup>

In one study, elderly mice given **nicotinamide riboside** experienced a **5% increase** in lifespan.<sup>14</sup>

For an average American, a **5%** lifespan extension might mean **four additional years** of life.<sup>15</sup>

A review published in **2022** describe the systemic effects of **NAD<sup>+</sup>** metabolism on cellular aging processes.<sup>2</sup>

## NAD<sup>+</sup> and Cellular Function

**NAD<sup>+</sup> (nicotinamide adenine dinucleotide)** is a coenzyme that is essential to sustaining healthy life.<sup>16</sup>

It is critical for the basic metabolism and energy supply of all cells. It is required for the normal function of over **300** proteins, including many vitally important ones.<sup>3</sup>

For example, **sirtuins** are a group of proteins that regulate cellular repair and defenses and help maintain cellular health.

**Low sirtuin activity** is tied to **accelerated aging** and risk for age-related issues. Preclinical studies have shown that *boosting* sirtuin function rejuvenates cells, repairs damage to DNA, and much more.<sup>5,16,17</sup>

Sirtuins **require NAD<sup>+</sup>** to function.<sup>16</sup> For this reason, cells need an ongoing supply of NAD<sup>+</sup> at all times to **function** optimally.

## Nicotinamide Riboside Raises NAD<sup>+</sup> Levels

**NAD<sup>+</sup>** production drops significantly with advancing age.<sup>5,18</sup>

A study using human skin samples from people across a wide age range found that **NAD<sup>+</sup>** levels had declined markedly in people **aged 30-50**, compared to infants from birth to the age of one year.

In the study subjects over **age 50**, NAD<sup>+</sup> levels in skin were reduced by more than **87%** compared to the infants'.<sup>19</sup>

This decline in NAD<sup>+</sup> leads to deteriorating cellular health. **Sirtuins** and other cell protectors that rely on NAD<sup>+</sup> cannot **function** properly with insufficient **NAD<sup>+</sup>** and cannot offer the defenses that sirtuins provide in youth.<sup>16</sup>

There's a way to **boost NAD<sup>+</sup>** back to healthier levels.

Scientists discovered that a form of vitamin B3 called **nicotinamide riboside** acts as a **NAD<sup>+</sup> precursor** when taken orally.<sup>11,13,14</sup>

It is readily taken up by cells, which use it to produce *more* NAD<sup>+</sup> and improve body levels of NAD<sup>+</sup>.<sup>20,21</sup>

In humans, oral supplementation of **nicotinamide riboside 250 mg** a day titrated up to **1,000 mg** twice daily was found to raise NAD<sup>+</sup> levels by **2- to 7-fold**.<sup>22</sup>

## Benefits of Boosting NAD<sup>+</sup>

Ample NAD<sup>+</sup> levels can contribute to many different areas of health, as suggested by preclinical studies, including:

- **Genetic Health.** Damage to **DNA** can cause rapid aging and chronic diseases. By supporting sirtuins and other enzymes, NAD<sup>+</sup> helps bolster cellular defenses to prevent this damage and even **repair existing DNA damage**. It also protects the function of **telomeres**, caps at the ends of chromosomes that are associated with longer life.<sup>3,8,16,17,23</sup>

## NAD<sup>+</sup> and Resveratrol Work Together

**Resveratrol** is a polyphenol found in red wine and various plants. It has well-documented benefits that help prevent age-related disease and slow the aging process.<sup>38</sup>

One of the key ways resveratrol works is by **activating** life-extending cellular **sirtuins**.<sup>39-42</sup>

Because sirtuins require **NAD<sup>+</sup>** to function, resveratrol's benefits cannot be maximized without *also* ensuring ample NAD<sup>+</sup> levels.

Taken together, **resveratrol** and **nicotinamide riboside** can boost each other's benefits.



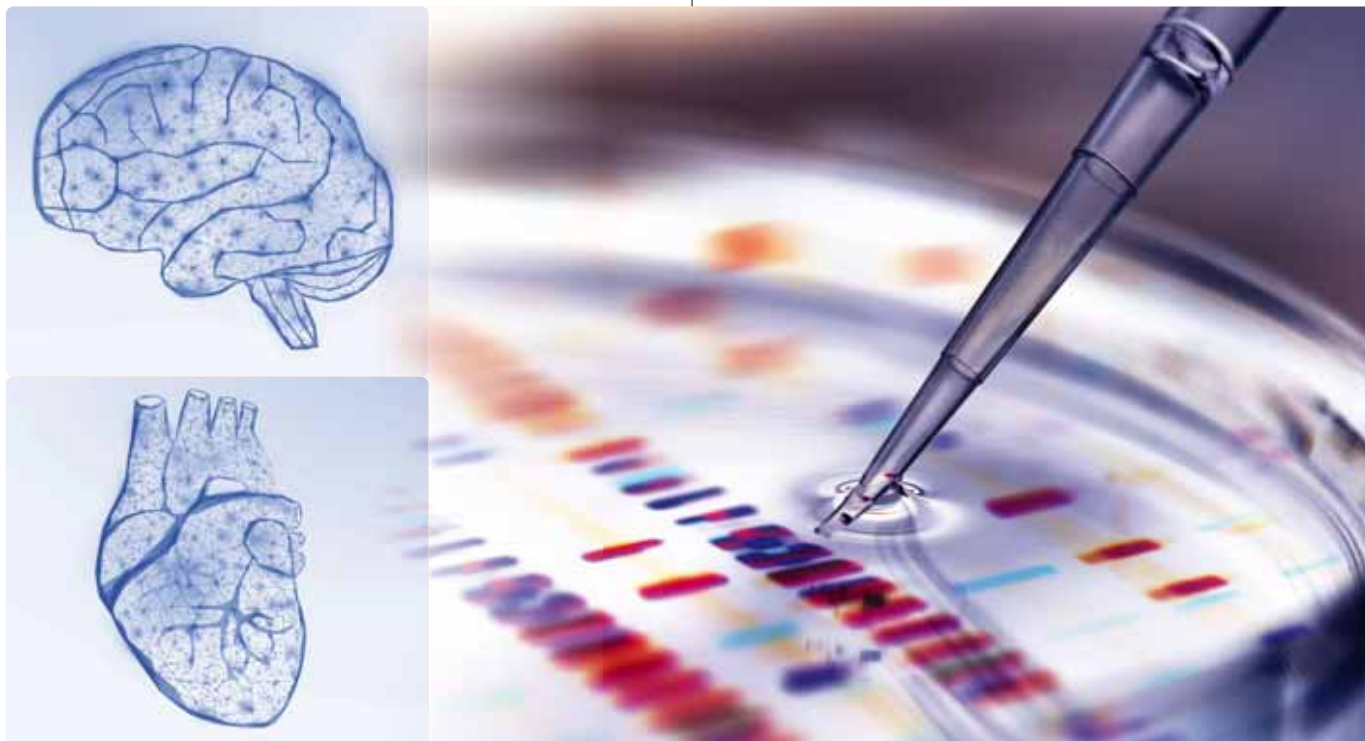


## WHAT YOU NEED TO KNOW

### Health Benefits of Nicotinamide Riboside

- **Energy Metabolism.** NAD<sup>+</sup> plays a central role in breaking down nutrients to supply energy to cells. Without it, cells suffer energy failure and cannot survive.<sup>2-4</sup>
- **Cellular Protection.** Oxidative stress and chronic inflammation have both been tied to virtually every age-related disease. Maintaining adequate NAD<sup>+</sup> combats both, inhibiting inflammation while aiding cellular antioxidant defenses.<sup>17,24</sup>
- **Stem Cell Health.** Healthy stem cells help maintain youthful tissue function, replacing old, damaged cells with healthy new ones. In animal model studies, both NAD<sup>+</sup> and sirtuins have been found to improve stem cell health.<sup>14,25-27</sup>

- Every living cell relies on NAD<sup>+</sup> for hundreds of cellular processes, including energy production, DNA repair, and sirtuin activity.
- NAD<sup>+</sup> levels drop with age. Boosting NAD<sup>+</sup> has been shown to protect cellular health, prevent age-related chronic disease, and extend lifespan in model organisms.
- **Nicotinamide riboside** is a NAD<sup>+</sup> precursor that can be taken orally and raises NAD<sup>+</sup> levels in humans and animal models.
- By boosting NAD<sup>+</sup> levels, nicotinamide riboside has demonstrated the ability in preclinical studies to support **longevity**, improve organ function, and reduce risk for age-related chronic disease.



### Nicotinamide Riboside Promotes Longevity

Scientists have consistently found in preclinical studies that NAD<sup>+</sup>-boosting **nicotinamide riboside** is capable of improving overall health, including the brain,<sup>28,29</sup> heart,<sup>30-32</sup> and blood vessels.<sup>33</sup>

For example, in rodent studies, **nicotinamide riboside**.<sup>28,31</sup>

- Reverses cognitive deficits and improves memory in models of **Alzheimer’s disease**,<sup>28</sup>
- Helps prevent the development of **heart failure**,<sup>31</sup> and
- Improves metabolism and helps prevent **weight gain**.<sup>28</sup>

A range of preclinical models have demonstrated that increasing nicotinamide riboside NAD<sup>+</sup> levels can **extend lifespan**.<sup>11-14</sup>

Yeast grown with nicotinamide riboside have an extended lifespan.<sup>11</sup> In worms, lifespan is extended at least **10%**.<sup>13</sup>

Giving **nicotinamide riboside** to mice that were the human equivalent of **70** years old<sup>14</sup> extended their lives by about **5%**.

A **5%** extended lifespan in a person might mean gaining nearly **four additional years** of life based on today’s average U.S. human life expectancy of roughly **76** years.<sup>15</sup>

### Clinical Trials

Impressed by animal studies showing benefits for boosting NAD<sup>+</sup>, scientists began conducting **clinical studies** with **nicotinamide riboside** to see if it translates to humans. Here is a sampling of human trials:

- A double blinded phase 1 clinical trial of newly diagnosed Parkinson’s disease patients received **1,000 mg** or placebo for 30 days. Participants receiving nicotinamide riboside showed an increase in brain NAD<sup>+</sup> levels and mild improvement of clinical symptoms.<sup>34</sup>
- In a double-blind, crossover trial, aged men received **1,000 mg** nicotinamide riboside per day for 21 days. After 21 days, elevated levels of NAD<sup>+</sup> in muscles of participants in the intervention group were seen. Nicotinamide riboside also reduced levels of circulating inflammatory cytokines.<sup>35</sup>

- In a clinical trial of 30 participants with clinically stable heart failure and reduced ejection fraction, a **1,000 mg** twice daily dose of nicotinamide riboside was well tolerated and resulted in boosting blood levels of NAD<sup>+</sup> to approximately double the level at baseline and reduced white blood cell expression of markers of systemic inflammation.<sup>36</sup>
- In a double blind, crossover study, 12 young and 12 aged individuals were randomized to receive nicotinamide riboside or placebo. Two hours before and after the supplementation, blood and urine samples were collected. At that time muscle fatigue and strength were assessed. Nicotinamide riboside supplementation showed increased NAD<sup>+</sup> levels. Interestingly, supplementation improved physical performance *only* in **elderly** subjects.<sup>37</sup> The conclusion from this finding indicates that declining NAD<sup>+</sup> levels due to age can be replenished with nicotinamide riboside supplementation, resulting in improved exercise performance.

## Summary

**NAD<sup>+</sup>** is a crucial compound in every living cell.

It is involved in the basic energy supply all cells need to thrive. It is also required for cellular regulators like **sirtuins** to help protect against rapid aging.

NAD<sup>+</sup> levels drop dramatically with age, contributing to accelerated aging.

**Nicotinamide riboside** is a NAD<sup>+</sup> precursor. Taken orally, it quickly boosts cellular NAD<sup>+</sup> levels.

In preclinical studies, nicotinamide riboside is tied to improved organ function and **longer life**. •

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



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Steven

VERIFIED CUSTOMER REVIEW



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# Cistanche Promotes Healthy Aging

BY LAURIE MATHENA



*Cistanche* is a medicinal herb that has been used in traditional Chinese medicine to support many different functions, including **brain health**.<sup>1-3</sup>

More recently, scientists have identified *Cistanche*'s potential for fighting cancer, reversing bone loss, and even *boosting lifespan*.

Together, this research adds to the growing body of evidence that oral intake of *Cistanche* could promote **healthier aging**.<sup>4-6</sup>

## Optimizing Immune Function

Maintaining healthy immune function is one of the best ways to enhance health and longevity.<sup>7</sup>

Immune function begins to malfunction as we age. Called *immune senescence*, this dysfunction increases the risk of **infections** and **cancer**, while also reducing the effectiveness of **vaccines**.<sup>8</sup>

One prime cause of the immune dysfunction suffered by the elderly is a marked *decrease* in **naïve T cells**<sup>9-11</sup> and functional **natural killer cells**,<sup>11,12</sup> along with an increase in pro-inflammatory cytokines.<sup>11</sup>

In human cell studies, and also in animal studies, *Cistanche* has been shown to target these aspects of **immune senescence**:<sup>4,13</sup>

- It **increased naïve T cells** and **natural killer (NK) cells**, and
- **Decreased** the pro-inflammatory cytokine **interleukin 6**.

An animal study demonstrated that injection of a *Cistanche* extract along with a seasonal influenza vaccine helped improve the **immune response** to the vaccine. The addition of the *Cistanche* extract resulted in more **rapid antibody production** and more effective T-cell response to the flu antigens.<sup>14</sup>

This indicates that *Cistanche* extract has the potential to increase the immune response to an influenza vaccine.

Finally, there's evidence from pre-clinical studies that *Cistanche* may have anti-inflammatory activity<sup>15</sup> that could support proper immune system function.<sup>6,13</sup>



## Potent Cognitive Protection

While *Cistanche* has been studied in multiple preclinical settings for its potential immune health benefits, a **human** study revealed that it could be an unsung hero for *brain* health as well.

In a placebo-controlled pilot study, 26 men and women with moderate **Alzheimer's disease** were randomized to three groups. Two treatment groups received either *Cistanche* extract capsules or Donepezil (prescription medication to improve cognition in Alzheimer's patients), the third group received a placebo. The *Cistanche* treatment group took **300 mg of *Cistanche* three times daily** for nearly a year.<sup>16</sup>

Compared to the untreated group, those taking *Cistanche* had significantly lower levels of certain **inflammatory factors** in the fluid surrounding their brain and spinal cord.

*Cistanche* also appeared to protect the brain from *shrinkage*.

In the untreated subjects, **hippocampus** volume shrank by **4.2%**. This is concerning, since this area of the brain plays a key role in **cognition, memory, and learning**.

The *Cistanche* group, on the other hand, had **no** change in the volume of their hippocampus.

Consistent with these findings, the *Cistanche* group performed significantly better on **cognitive tests** at the end of the study.<sup>16</sup>

These benefits could be due in part to a beneficial polyphenol in *Cistanche* called **echinacoside**.<sup>13,17</sup> In a rat model of Alzheimer's, **echinacoside** and other bioactive components of *Cistanche* were found to pass through the blood-brain barrier.<sup>2</sup>

That is where *Cistanche's* **anti-inflammatory** activity helps protect against the damaging effects of **neuroinflammation**.<sup>18</sup>

## Cancer-Fighting Potential

Preclinical research suggests *Cistanche* has activity against numerous types of cancer. Studies have demonstrated that *Cistanche*:

- Inhibits growth of **breast cancer** cells,<sup>19</sup>
- Inhibits growth of **colorectal cancer** cells,<sup>13</sup> and
- Induces apoptosis and cell cycle arrest in **esophageal cancer** cells.<sup>20</sup>

In **hepatocellular carcinoma**, the most common type of liver cancer, a mouse study showed that *Cistanche* increased levels of cancer-fighting CD8+ T cells, inhibited the growth of **liver cancer** cells, and greatly improved the rodents' **survival rate**.<sup>21</sup> Another rat study showed *Cistanche* inhibited hepatocellular carcinoma cell growth in a dose-dependent manner.<sup>22</sup>

In an impressive lab study, *Cistanche* inhibited the growth of colon cancer cells by **60% within just 72 hours** of treatment. This included primary and metastatic colon cancer cells.<sup>23</sup>

## Longevity Effects

*Cistanche* has been shown to significantly boost **lifespan** in fruit flies and roundworms. Scientists use these species because their short lifespan allows them to quickly test lifespan effects of a compound.

In one study, when adult fruit flies were given *Cistanche* extract for 20 days, it extended their average **lifespan** by as much as **18.9%**.<sup>5</sup>

In another study, the **echinacoside** found in *Cistanche* increased the average **lifespan** of roundworms by **13.64%**, compared to an untreated group.<sup>24</sup>

*Cistanche* has also been shown to boost the secretion of growth hormone in rat pituitary cells. This could impact lifespan since growth hormone declines with age.<sup>25</sup>

### Latest Studies

Research continues to reveal new and diverse benefits of *Cistanche*. In just the past six years alone, animal studies and preclinical research studies have revealed *Cistanche*'s potential ability to:

- Reverse bone loss and improve bone density,<sup>6,13,26</sup>
- Improve insulin resistance and promote healthy blood sugar levels,<sup>6</sup>
- Treat or prevent depression,<sup>27</sup>
- Lower cholesterol,<sup>6</sup>
- Combat physical fatigue,<sup>3,6,13,28</sup>
- Support reproductive health,<sup>6,13,28</sup>
- Alleviate constipation,<sup>6,13,28</sup> and
- Reduce the severity of cataracts.<sup>6,13,28</sup>

### Summary

Extracts of the herb ***Cistanche*** contain bioactive compounds that could support immune function, protect brain health, help fight cancer, reverse bone loss, and more.

Exciting studies also show the potential of *Cistanche* to impact longevity factors and increase lifespan.

Together, this research adds to the growing body of evidence that oral intake of *Cistanche* may promote healthier aging. •

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

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# Kimchi

BY LAURIE MATHENA



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Ages ago, fermentation was a practical process that extended the shelf life of vegetables while boosting the flavor and aroma of the food.

But this process also changes a *health* food into a true **superfood**.

During fermentation, bacteria and yeast break down sugars into an acid. This produces a probiotic-rich food that promotes a healthy, balanced microbiome.<sup>1</sup>

As a result, there are benefits of fermented foods throughout the body, as thousands of studies have demonstrated.

One specific type of fermented food is **kimchi**, a Korean dish that most often contains cabbage, and that has a unique blend of salty, sour, and savory notes.

Kimchi is a source of protein and fiber.<sup>1</sup>

A test-tube study showed that a main compound found in kimchi (called HDMPPA) had **anti-inflammatory** properties.<sup>2</sup> A mouse study showed that this compound *improved blood vessel function* by supporting nitric oxide production and reducing inflammation.<sup>3</sup>

Numerous studies indicate that consuming kimchi can help support metabolic health and promote weight loss.

For example, when 100 people consumed **15 grams to 210 grams** of kimchi daily for just one week, they experienced decreases in blood sugar and total cholesterol. The greater the amount consumed, the greater the benefit.<sup>4</sup>

In a study of 22 overweight people, adding kimchi to their diets for four weeks led to reductions in body weight, body mass index, and body fat.<sup>5</sup> Individuals also saw decreased blood sugar levels and improvements in blood pressure readings.

Kimchi could even impact aging itself. In a study of human cells, treating them with kimchi increased their viability and **extended their overall lifespan**.<sup>6</sup>

Many grocery stores carry kimchi in the produce aisle. You can also find recipes online to make your own homemade kimchi.

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# Cistanche

## for Systemic Health

"Excellent product."

**Andrew**

VERIFIED CUSTOMER REVIEW

**Cistanche**, an herb used in traditional Chinese medicine, has been shown in animal studies to:

- Promote longevity<sup>1</sup>
- Support immune cells such as naïve T and natural killer cells<sup>1,2</sup>
- Provide neuroprotection<sup>3</sup>



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

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**Note:** The same dose of standardized Cistanche can also be found in the Immune Senescence Protection Formula that also provides Reishi mushroom and Pu-erh tea extracts.

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\*Int J Med Sci. 2019;16(6):845-53.

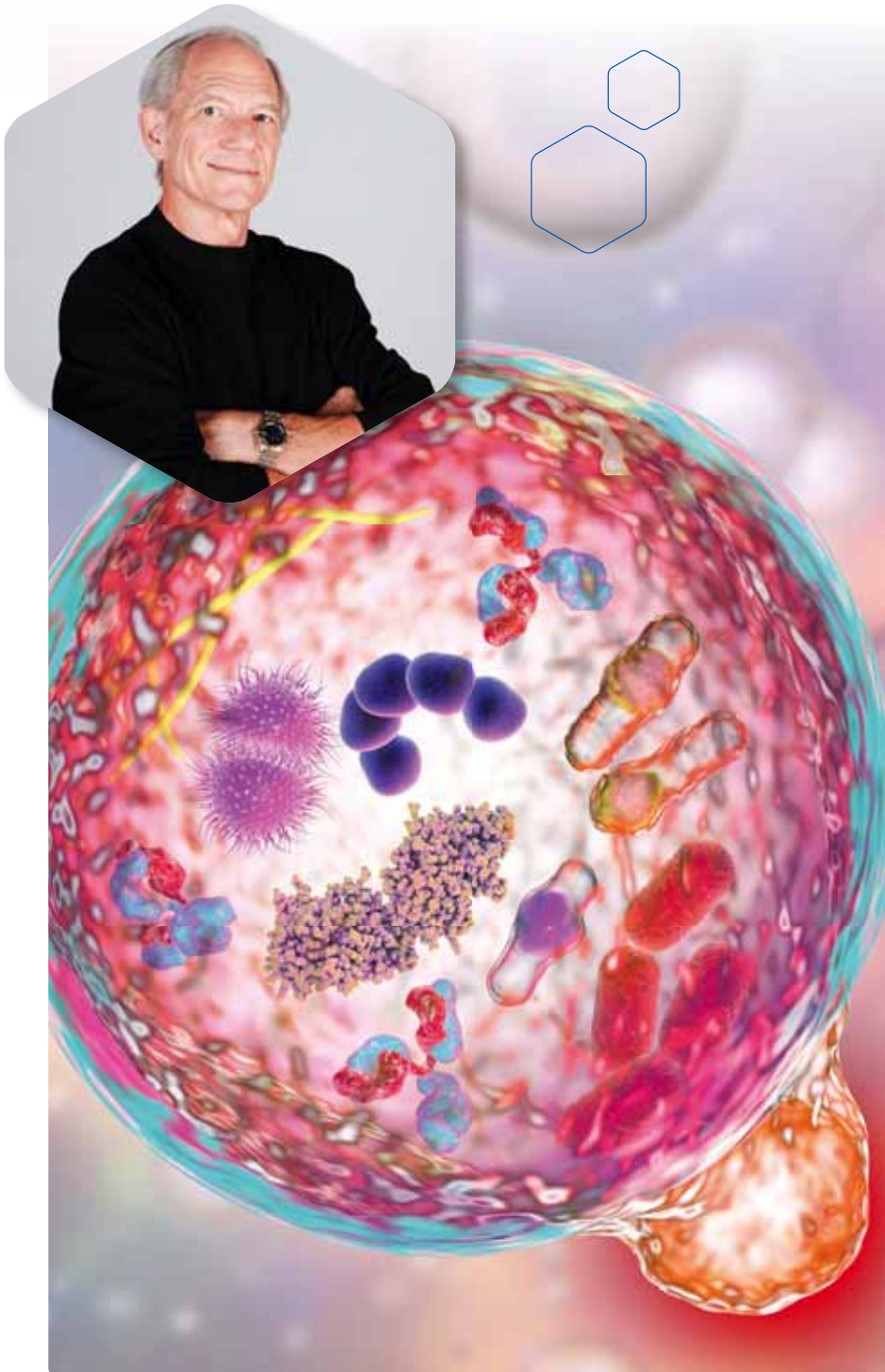
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# Rapamycin's Role in Fighting Aging



Some of the most promising advances in anti-aging science involve the drug **rapamycin** and its effects on a cellular protein called **mTOR** and the process of **autophagy**, or “cellular housekeeping.”<sup>1</sup>

In this interview, *Life Extension* discusses the latest research with pharmacist Ross Pelton, who recently published the second edition of his book, *Rapamycin, mTOR, Autophagy & Treating mTOR Syndrome*.

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**Life Extension:** Can you explain what mTOR and autophagy are?

**Ross Pelton:** mTOR and autophagy are the yin and yang of cellular metabolism. **mTOR** is a protein that initiates growth signals in cells when nutrients are available. When nutrients are *not* available, **autophagy** is activated. Autophagy breaks down and removes old or damaged cellular components, which is critical for rebuilding and renewal of the body.<sup>1,2</sup>



**LE:** In the new edition of your book, you propose the **mTOR/Autophagy Theory of Aging**. What is that?

**Pelton:** For millions of years of human evolution, the **mTOR/autophagy** ratio was about **1:4**. That means mTOR was activated approximately **20%** of the time while autophagy was activated about **80%** of the time.

These days, the ratio is reversed. Most people have mTOR activated about **80%** each day and only about **20%** autophagy. This reversal is largely due to drastic changes in the amount of time modern humans spend consuming calories every day compared to our ancestors.

This mTOR/autophagy imbalance is associated with common diseases including cancer, Alzheimer's and Parkinson's diseases, obesity and diabetes, and cardiovascular disease.<sup>3</sup> Recent studies confirm that **under-activation** of autophagy is a fundamental cause of metabolic dysfunction and accelerated biological aging.<sup>4</sup>

**LE:** How can we correct the under-activation of autophagy?

**Pelton:** Rapamycin is a drug approved by the FDA to treat some cancers and prevent organ transplant rejection.<sup>5</sup> Its ability to *activate* autophagy is a major aspect of its ability to increase **healthspan** and **lifespan**.<sup>6</sup>

**LE:** Are there specific conditions rapamycin can help prevent?

**Pelton:** I wrote a chapter in the second edition of my book on **sarcopenia**, the loss of muscle mass and strength in older adults. Sarcopenia results in loss of function and greater risk of falls, fractures, hospitalizations, and death. Three interventions that have been shown to delay the onset of sarcopenia are strength training, dietary protein, and rapamycin.

Strength training helps build muscle mass and delay the onset of physical disability.<sup>7</sup> Dietary protein is required for muscle protein synthesis. By activating **autophagy**, rapamycin clears out old, damaged proteins, setting the stage for new muscle protein synthesis when mTOR is reactivated.

**LE:** Does rapamycin have other anti-aging benefits?

**Pelton:** A paper published in 2021 documented that rapamycin reduces translation errors in **protein synthesis**. Increased fidelity of protein synthesis extends lifespan in several animal models. This represents *another* way rapamycin improves health and extends lifespan, independent of its effect on mTOR and autophagy.<sup>6</sup>

**LE:** Is there additional evidence supporting the use of rapamycin to extend lifespan?

**Pelton:** I reported on a study conducted by Vera Gorbunova, PhD, co-director of the Rochester Aging Research Center. Her research focuses on the genomes of exceptionally long-lived mammals, which have many genes in common that affect lifespan.<sup>8</sup>

Dr. Gorbunova examined **10** prominent life extension therapies in mice and assessed how each affected the genes associated with **maximum lifespan**.<sup>9</sup>

Of the 10, **rapamycin** had the greatest effect on activation of genes associated with maximum lifespan. It also had the *lowest* effect on activation of genes that *negatively* affect lifespan.

This study provides strong support for the claim that rapamycin is an effective life extension drug.

**LE:** Who can benefit from rapamycin?

**Pelton:** I think most adults aged 50 and older can gain significant health benefits from taking rapamycin. Individuals with certain medical conditions such as obesity might benefit by starting at a younger age, but these decisions need to be made with a physician. Pregnant women should *not* take rapamycin.

**LE:** What motivated you to write a second edition of your first *RAPAMYCIN* book?

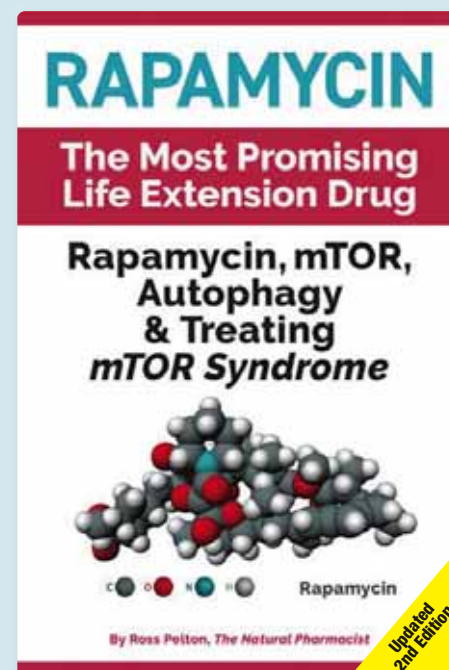
**Pelton:** I was pleasantly surprised by the continuing number of published studies that corroborate what I wrote just a few years prior about rapamycin, mTOR, and autophagy. What inspired me the most are newly identified mechanisms of action to explain the ability of rapamycin to extend life span while combating the most prevalent diseases afflicted aging humans.

**LE:** Do you have any final thoughts you'd like to share with our readers?

**Pelton:** When something is broken, you have to remove the damaged or broken part before you can replace it with a new part. In your body, old damaged cellular components (mostly proteins and enzymes) cause varying degrees of malfunction. Autophagy removes these damaged cellular components so they are replaced by healthy new ones. Autophagy is the constant process of rebuilding and renewing your body. Under-activation of autophagy is one of the most serious causes of accelerated biological aging. Rapamycin inhibits mTOR and activates autophagy, which increases lifespan and healthspan. •

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The second edition of *Rapamycin, mTOR, Autophagy & Treating mTOR Syndrome* can be ordered from **Life Extension** by calling 1-866-598-6747 or visiting [www.LifeExtension.com/TOR](http://www.LifeExtension.com/TOR)

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- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

ACTIVATE CELLULAR

# Autophagy

Help Your Cells  
Remove Internal  
Debris



**GEROPROTECT® Autophagy Renew<sup>†</sup>** stimulates the body's "cellular cleanup" process essential to youthful function.

**Artificial Intelligence** was one of the tools utilized by researchers to help develop this nutrient blend.

The formula contains **luteolin** and **piperlongumine** to:

- Promote ongoing cellular housekeeping
- Encourage healthy cell debris removal
- Inhibit mTOR signaling

Activating **autophagy** supports healthy cellular function and longevity.

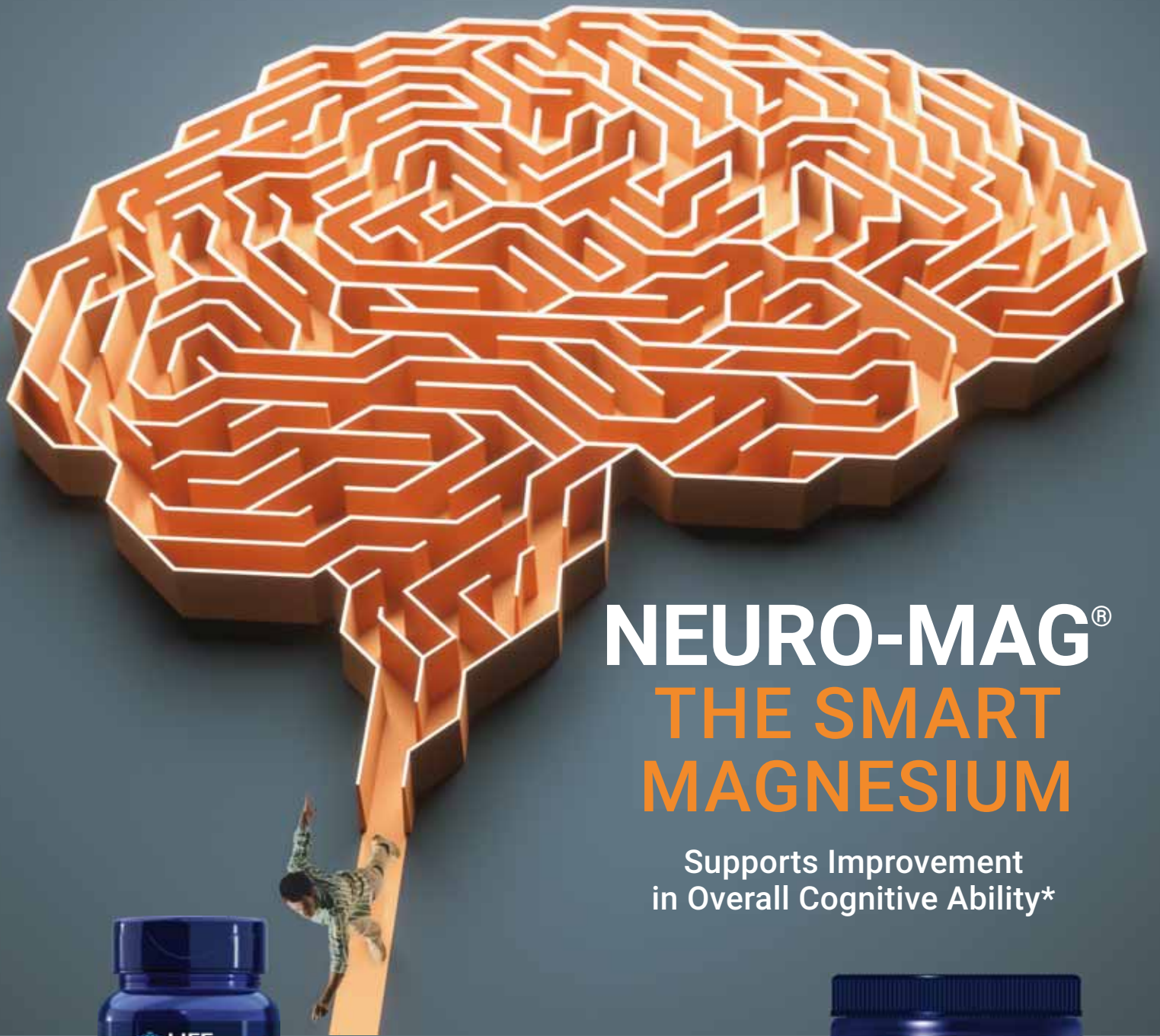
**Item #02415** • 30 vegetarian capsules  
1 bottle **\$19.50** • 4 bottles \$17.50 each

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

<sup>†</sup>Developed in collaboration with Insilico Medicine, Inc.



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



# NEURO-MAG<sup>®</sup>

## THE SMART MAGNESIUM

Supports Improvement  
in Overall Cognitive Ability\*



With age, **synapses** that connect our brain cells wither.

Formulated by MIT scientists, **Neuro-Mag<sup>®</sup> Magnesium L-Threonate** has been shown to improve **synaptic density** and other structural components of the brain.



**Item #01603** • 90 vegetarian capsules  
1 bottle **\$30.75** • 4 bottles \$27.50 each



**Item #02032** • 93.35 grams of powder  
1 jar **\$30.75** • 4 jars \$27.50 each

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

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

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



IN THIS EDITION OF *LIFE EXTENSION* MAGAZINE®



7 **TRAGIC ERRORS!**

The **U.S. Preventive Services Task Force** advised *against* **PSA screening** in **2008-2012**. A **2022** study published in **JAMA** finds a striking increase in **metastatic** prostate cancers. This happened as physicians stopped utilizing this **proven** *early*-detection method.

22 **OMEGA-3 AND MACULAR DEGENERATION**

Two meta-analyses find that *higher* intake of **fish oil** protects against development and progression of age-related **macular degeneration**.

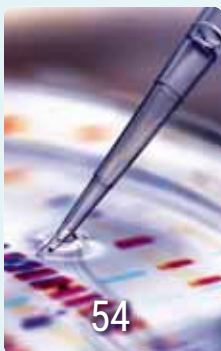


34 **REDUCE STRESS...SHARPEN MENTAL FOCUS**

**Ashwagandha** combined with a patented **spearmint** extract *increased* mental alertness while restoring calm.

44 **ARTERIAL PLAQUE**

In a controlled study, two **plant extracts** inhibited **atherosclerosis** and reduced **unstable** plaque. This led to an **82%** reduction in major **cardiovascular** events.



54 **NAD<sup>+</sup> AND HEALTHY LONGEVITY**

Found in every living cell, **NAD<sup>+</sup>** levels decline with age. In animal models, restoring NAD<sup>+</sup> supports brain, heart, and metabolic health.

63 **SYSTEMIC EFFECTS OF CISTANCHE**

**Cistanche**, a Chinese herb, has been shown in animal studies to have **neuroprotective** and **immune** enhancing properties.