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April 2024

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# PROTECT AGAINST AGE-RELATED **VISION LOSS**

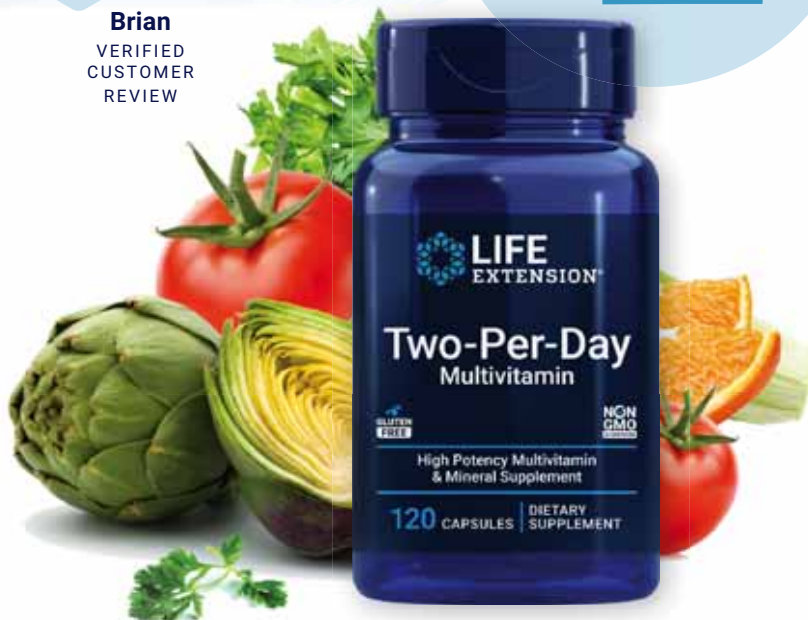


**PLUS—Exclusive Interview:**  
**JOSE CORDEIRO, PH.D.**  
**Prospect of Extended Human Lifespans**

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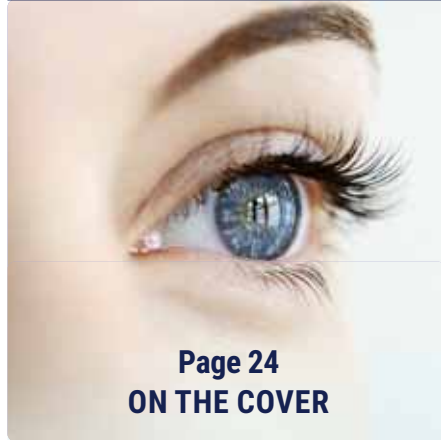
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## REPORTS



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Smart phones, high blood sugar, and UV light damage eye tissues and lead to vision loss. Clinical studies reveal simple measures to better preserve ocular health.

### 34 EFFECTS OF DIETARY PROTEIN ON MUSCLE, BONE, AND FRAILTY

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### 46 REDUCE NIGHTTIME BATHROOM VISITS

In a **clinical study**, a blend of five compounds **reduced** the frequency of nighttime urination. No subjects woke up more than **once** a night and the number suffering from **nocturia** dropped by **64%**.

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### 73 SINGAPORE OPENS FIRST PUBLIC "HEALTHY LONGEVITY CLINIC"

The world's first **Healthy Longevity Clinic** located within a **public hospital** has recently opened in Singapore. The goal is to increase the **healthspan** of Singaporeans.

## DEPARTMENTS

### 7 CANCER DEATH RATES DROP... BUT NOT ENOUGH!

Mainstream media hailed a **32%** reduction in cancer **death rates** since **1991**, but **16 million** American lives were lost to **cancer** during this period. Combination **treatments** and **screenings** could have saved many lives, along with creative use of **repurposed** medications and healthy **dietary** changes.

### 17 IN THE NEWS

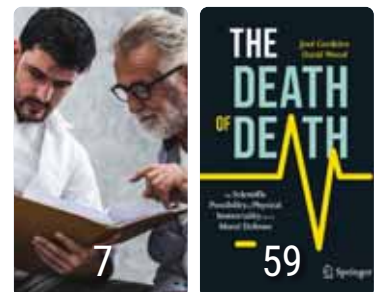
Taurine may delay aging; omega-3 protects against exercise-induced inflammation; vitamin B6 decreases *H. Pylori* treatment side effects; and more.

### 59 AUTHOR INTERVIEW

In their book, *The Death of Death*, Jose Luis Cordeiro and David Wood outline the scientific possibility of super longevity due to artificial intelligence, tissue regeneration, and genetic therapies.

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**Quinoa**, an edible seed, is a good source of gluten-free protein and fiber. Studies show it improves satiety, cholesterol, BMI, and blood sugar.



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for many years  
would not stop."

**Alicia**

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# Power Up Your Hard-Working Heart

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#### References

1. *Mol Nutr Food Res.* 2012 Sep;56(9):1385-97.
2. *Eur J Pharm Sci.* 2003 Jul;19(4):299-304.
3. *Int J Pharm.* 2011 June 30; 412(1-2):99-105.



# Cancer Death Rates Drop, Why Am I Not Impressed?



WILLIAM FALOON

Headline news trumpeted a **32% reduction** in **cancer death rates** since **1991**.<sup>1</sup>

These **lower death rates** translate into **3.5 million fewer** Americans dying from **cancer** than what the **American Cancer Society** expected.<sup>1,2</sup>

The success is largely attributed to **declines** in **smoking-related cancers**. Other contributing factors are:<sup>1</sup>

- **Prevention**—early detection through screening of some cancers
- **Combination** treatments for many cancers
- **Chemotherapy** after breast and colon cancer surgery

My first critique deals with the forgotten **611,000** Americans who will **perish** from **cancer** this year.<sup>1</sup> Why aren't **more** patient-friendly **curative** treatments available?

It is now **53 years** since the famous "**War on Cancer**" was declared.<sup>3</sup> Yet the establishment cited the greatest reason for their success is the decline in **tobacco** use.

**Combination treatments** were long ago advocated as were screenings to detect malignancies in **early** stages.

The horrific short- and long-term **side effects** of chemo, radiation, and other toxic therapies are **omitted** from the glowing findings of a **32% reduction** in **cancer death** rates.<sup>1</sup>

The **2023 American Cancer Society** report also exposes a sordid fact about the second most deadly cancer in men. It won't surprise legacy readers of **Life Extension® Magazine**.

The proportion of **metastatic prostate cancers** has more than **doubled** in the past 10 years.<sup>4</sup>

This increase is in response to the **United States Preventative Services Task Force** recommendation in **2008-2012** for men to **avoid PSA** (prostate-specific antigen) **screening**.

As I relentlessly predicted, the drop in **PSA screening** is leading to a surge of **late-stage** prostate cancers that will result in hundreds of thousands of needless, painful **deaths**.

This has caught the attention of the **American Cancer Society** as they fear that hard fought gains in recent decades are being **reversed** by increases in **advanced-stage** prostate disease. The American Cancer Society CEO stated:

***"There's a significant call to arms... We are not catching these cancers early when we have an opportunity to cure men of prostate cancer."***<sup>5</sup>

This article outlines the **off-label** use of a **drug** that has been shown in some studies to improve **overall cancer survival**. I also describe recent reviews supporting healthy **dietary** changes to help combat malignancies.



Conventional medicine's approach to cancer prevention and treatment omits many promising strategies. Lacking is the will to reach out for easy-to-implement adjuvant treatments.

Published studies corroborate the benefits of a broad array of dietary changes, lifestyle modifications, and repurposed medications.<sup>6-10</sup>

An ever-widening gap exists between scientific discoveries and practical applications of lifesaving knowledge.

Too often patients allow themselves to be left out of the fight when more can be done to **improve** treatment outcomes.

Almost everyone is aware that **diet** and **lifestyle** influence one's likelihood of getting cancer. Less known is that cancer cells can be favorably or adversely influenced by one's nutritional habits.

Cancer cells often undergo mutations that make them more resistant to treatment.<sup>11</sup> Many of these cellular alterations have been mapped out, all the way down to their mechanism of action and the relevant gene expression involvement.

Two recent review papers converged to document specific ways in which these dangerous, evolutionary features of cancer can be suppressed by healthy nutrients, the bulk of them found in relatively high densities in the **Mediterranean diet**.<sup>12,13</sup>

The box on the next page provides a partial list of largely **plant-derived** anti-cancer compounds.



## Anti-Cancer NUTRIENTS in a Mediterranean Diet

Nutrients found in the following foods have demonstrated **anti-cancer** properties via multiple well-defined mechanisms:



Grapes<sup>14-16</sup> and other berries<sup>17-19</sup> are reservoirs of a wide variety of polyphenols like **quercetin**<sup>20</sup> and a complex of other nutrients like **anthocyanins**.<sup>21-24</sup>



**Cruciferous** and **allium** vegetables are rich in a variety of organic sulfurs;<sup>25-27</sup> broccoli sprouts contain high amounts of **sulforaphane**,<sup>28-30</sup> while garlic more uniquely contains **diallyl disulfide**.<sup>31-33</sup>



Tomatoes, and even more so tomato sauce, are staples of the Mediterranean diet that are densely packed with **lycopene**.<sup>34,35</sup>

**Turmeric**, a common spice also used in tea, contains high concentrations of **curcumin**.<sup>36,37</sup>



Milk thistle, traditionally consumed as a tea, is a principal source of **silibinin**.<sup>38</sup>

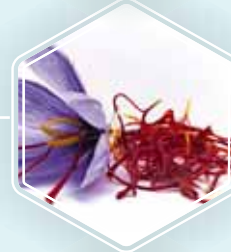
Saffron, a very common spice, has an extremely high density of **kaempferol**,<sup>39,40</sup> **crocin** and **crocetin**.<sup>40-43</sup>



Extra virgin olive oil, another staple of the Mediterranean diet, contains **oleocanthal**, **oleuropein** and **hydroxytyrosol**.<sup>44-46</sup>

Parsley, celery, and chamomile tea are major sources of **apigenin**.<sup>47,48</sup>

Cold water fish are rich in omega-3 fatty acids **EPA** and **DHA**.<sup>49-51</sup>



The authors of one of the recent published reviews concluded the **Mediterranean diet** may:

***"...inhibit all stages of carcinogenesis through multiple mechanisms."***<sup>13</sup>

On the contrary, the Americanized **western diet** is laden with carcinogens that aid tumor formation and proliferation.

A significant dietary contribution to cancer is not the food itself, but the practice of **over-processing** and **overheating**, which makes typical foods more dangerous.

Some foods are especially troublesome.

One of the recent reviews concluded that a diet heavy in **processed meats** and **dairy**, while lacking in **plant-based** foods is:

*“...conducive to the development of prostate cancer through a number of mechanisms that stimulate cancer cell proliferation and angiogenesis processes.”<sup>13</sup>*

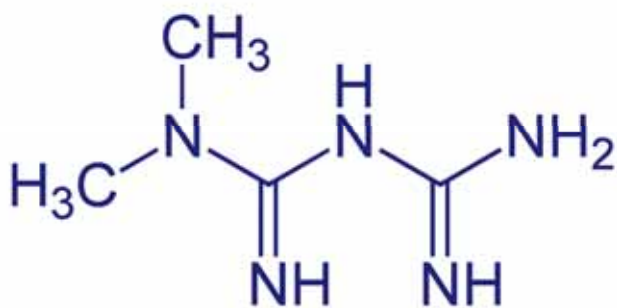
A two-fold benefit can be seen by those who remove toxic **dietary** agents and replace them with **nutrients** that help defend against cancer.

### Repurposed medications

**Life Extension** has long suggested the repurposing of drugs like **metformin** for potential anti-aging and anti-cancer benefits.

Metformin is an **AMPK activator** that plays central metabolic roles for impeding **inflammation** and slowing **cancer cell propagation**.<sup>52-54</sup>

### METFORMIN



## Year 2024

**American Cancer Society** expects a record of more than **2 million** new cancer cases in **U.S.**

A report published in early **2024** projects **611,000** Americans will die from **cancer** this year. That's more than any previous year.<sup>1</sup>

This **American Cancer Society** report shows incidence is on the rise for 6 out of 10 of the most common **cancers**.<sup>1</sup>

- **Breast**
- **Prostate**
- **Kidney**
- **Pancreatic**
- **Endometrial**
- **Melanoma**

While cancer **death rates** have been declining, rising diagnoses of common malignancies threaten what has been a hard-fought downward trend.

The American Cancer Society predicts almost **5,500** Americans will be diagnosed with a new **cancer** every day in **2024**. And treatments, even when effective, can have brutal short- and long-term side effects.<sup>1</sup>

These bleak numbers are unprecedented. They partially reflect an aging and growing U.S. population with high obesity prevalence, unhealthy diets, and sedentary lifestyles.<sup>1,6-10,55</sup>

More frequent and widespread screenings, along with emphasis on **cancer risk-reducing** interventions are urgently needed.

The title of this editorial is “**Cancer Death Rates Drop. Why Am I Not Impressed?**” I wrote this before the grim report from the American Cancer Society published January 17, 2024 about record numbers of new **cancer** cases and deaths projected in **2024**.

A 2019, *Nature* review of over **1.6 million** prostate cancer patients found use of **metformin** to have a statistically significant:

**40% reduced risk of death from prostate cancer recurrence and**

**28% increased composite survival rate.**<sup>52</sup>

Not all studies yield these robust benefits, but prostate cancer patients may consider **metformin** as one of many adjunctive multi-interventional approaches.

### Why I am not impressed...

Mainstream news outlets recently heralded lower death rates that enabled a total of **3.5 million fewer** American cancer **deaths** since **1991**.<sup>2</sup>

While every life saved is noteworthy, I argue that more progress should have occurred over this **multi-decade** period in which **16 million** Americans perished from cancer.

I advocate for these **16 million** lives lost to cancer, many that could have been spared with greater progress and better adoption of existing adjuvant interventions in the clinical setting.

The published medical literature reveals a trove of innovative tactics to counter cancer, with researchers leveraging ever-increasing knowledge to find improved ways to exploit cancer's weaknesses.

We at **Life Extension®** have long argued for greater emphasis on multi-modal cancer treatments. We are increasingly not alone in encouraging the deployment of more comprehensive treatments.

To review updated findings about repurposed medications being studied as adjuvant therapies against various forms of cancer, visit [www.LifeExtension.com/meds](http://www.LifeExtension.com/meds)

For longer life,



William Faloan, Co-Founder  
**Life Extension®**




### References

1. Available at: <https://www.cancer.org/research/acs-research-news/facts-and-figures-2024.html>. Accessed January 23, 2024.
2. Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. *CA: A Cancer Journal for Clinicians*. 2022;72(1):7-33.
3. Available at: <https://www.cancer.gov/about-nci/overview/history/national-cancer-act-1971>. Accessed January 9, 2024.
4. Available at: <https://www.facs.org/media-center/resources-for-journalists/prostate-cancer-awareness/#:~:text=After%20years%20of%20decline%2C%20cases,from%203.9%25%20to%208.2%25>. Accessed January 4, 2024.
5. Available at: <https://abcnews.go.com/Health/cancer-death-rates-racial-disparities-persist-black-men/story?id=96376825#:~:text=In%20addition%2C%20doctors%20are%20catching,in%20breast%20and%20uterine%20cancer>. Accessed January 4, 2024.
6. Wilson KM, Mucci LA. Diet and Lifestyle in Prostate Cancer. *Adv Exp Med Biol*. 2019;1210:1-27.
7. Plym A, Zhang Y, Stopsack KH, et al. A Healthy Lifestyle in Men at Increased Genetic Risk for Prostate Cancer. *Eur Urol*. 2023 Apr;83(4):343-51.
8. Rock CL, Thomson CA, Sullivan KR, et al. American Cancer Society nutrition and physical activity guideline for cancer survivors. *CA Cancer J Clin*. 2022 May;72(3):230-62.
9. Choi JW, Hua TNM. Impact of Lifestyle Behaviors on Cancer Risk and Prevention. *J Lifestyle Med*. 2021 Jan 31;11(1):1-7.
10. Morita M, Kudo K, Shima H, Tanuma N. Dietary intervention as a therapeutic for cancer. *Cancer Sci*. 2021 Feb;112(2):498-504.
11. Mansoori B, Mohammadi A, Davudian S, et al. The Different Mechanisms of Cancer Drug Resistance: A Brief Review. *Adv Pharm Bull*. 2017 Sep;7(3):339-48.
12. Maroni P, Bendinelli P, Fulgenzi A, Ferraretto A. Mediterranean Diet Food Components as Possible Adjuvant Therapies to Counteract Breast and Prostate Cancer Progression to Bone Metastasis. *Biomolecules*. 2021 Sep 9;11(9).
13. Oczkowski M, Dziendzikowska K, Pasternak-Winiarska A, et al. Dietary Factors and Prostate Cancer Development, Progression, and Reduction. *Nutrients*. 2021 Feb 3;13(2).
14. Zhou K, Raffoul JJ. Potential anticancer properties of grape antioxidants. *J Oncol*. 2012;2012:803294.
15. Castillo-Pichardo L, Martinez-Montemayor MM, Martinez JE, et al. Inhibition of mammary tumor growth and metastases to bone and liver by dietary grape polyphenols. *Clin Exp Metastasis*. 2009;26(6):505-16.
16. Hanausek M, Spears E, Walaszek Z, et al. Inhibition of murine skin carcinogenesis by freeze-dried grape powder and other grape-derived major antioxidants. *Nutr Cancer*. 2011;63(1):28-38.

17. Bishayee A, Haskell Y, Do C, et al. Potential Benefits of Edible Berries in the Management of Aerodigestive and Gastrointestinal Tract Cancers: Preclinical and Clinical Evidence. *Crit Rev Food Sci Nutr*. 2016 Jul 26;56(10):1753-75.
18. Afrin S, Giampieri F, Gasparriani M, et al. Chemopreventive and Therapeutic Effects of Edible Berries: A Focus on Colon Cancer Prevention and Treatment. *Molecules*. 2016 Jan 30;21(2):169.
19. Bowen-Forbes CS, Bowen-Forbes CS, Zhang Y, Nair MG. Anthocyanin content, antioxidant, anti-inflammatory and anticancer properties of blackberry and raspberry fruits. *Journal of Food Composition and Analysis*. 2010;23:554-60.
20. Sethi G, Rath P, Chauhan A, et al. Apoptotic Mechanisms of Quercetin in Liver Cancer: Recent Trends and Advancements. *Pharmaceutics*. 2023 Feb 20;15(2).
21. Niedzwiecki A, Roomi MW, Kalinovsky T, Rath M. Anticancer Efficacy of Polyphenols and Their Combinations. *Nutrients*. 2016 Sep 9;8(9).
22. Pejic T, Tosti T, Dzamic Z, et al. The Polyphenols as Potential Agents in Prevention and Therapy of Prostate Diseases. *Molecules*. 2019 Nov 4;24(21).
23. de Arruda Nascimento E, de Lima Coutinho L, da Silva CJ, et al. In vitro anticancer properties of anthocyanins: A systematic review. *Biochim Biophys Acta Rev Cancer*. 2022 Jul;1877(4):188748.
24. Kim KH, Ki MR, Min KH, Pack SP. Advanced Delivery System of Polyphenols for Effective Cancer Prevention and Therapy. *Antioxidants (Basel)*. 2023 May 5;12(5).
25. Zhang J, Yang J. Allium Vegetables Intake and Risk of Breast Cancer: A Meta-Analysis. *Iran J Public Health*. 2022 Apr;51(4):746-57.
26. Wu X, Shi J, Fang WX, et al. Allium vegetables are associated with reduced risk of colorectal cancer: A hospital-based matched case-control study in China. *Asia Pac J Clin Oncol*. 2019 Oct;15(5):e132-e41.
27. Guo L, Yuan X, Yang B, et al. Association between Allium vegetables and the risk of non-digestive tract cancer: A systematic review and meta-analysis of cohort and case-control studies. *Cancer Treat Res Commun*. 2022;32:100598.
28. Soundararajan P, Kim JS. Anti-Carcinogenic Glucosinolates in Cruciferous Vegetables and Their Antagonistic Effects on Prevention of Cancers. *Molecules*. 2018 Nov 15;23(11).
29. Elkashty OA, Tran SD. Sulforaphane as a Promising Natural Molecule for Cancer Prevention and Treatment. *Curr Med Sci*. 2021 Apr;41(2):250-69.
30. Ngo SNT, Williams DB. Protective Effect of Isothiocyanates from Cruciferous Vegetables on Breast Cancer: Epidemiological and Preclinical Perspectives. *Anticancer Agents Med Chem*. 2021;21(11):1413-30.
31. Yi L, Su Q. Molecular mechanisms for the anti-cancer effects of diallyl disulfide. *Food Chem Toxicol*. 2013 Jul;57:362-70.
32. Mitra S, Das R, Emran TB, et al. Diallyl Disulfide: A Bioactive Garlic Compound with Anticancer Potential. *Front Pharmacol*. 2022;13:943967.
33. Xu S, Huang H, Tang D, et al. Diallyl Disulfide Attenuates Ionizing Radiation-Induced Migration and Invasion by Suppressing Nrf2 Signaling in Non-small-Cell Lung Cancer. *Dose Response*. 2021 Jul-Sep;19(3):15593258211033114.
34. Kapala A, Szlendak M, Motacka E. The Anti-Cancer Activity of Lycopene: A Systematic Review of Human and Animal Studies. *Nutrients*. 2022 Dec 3;14(23).
35. Qi WJ, Sheng WS, Peng C, et al. Investigating into anti-cancer potential of lycopene: Molecular targets. *Biomed Pharmacother*. 2021 Jun;138:111546.
36. Tomeh MA, Hadianamrei R, Zhao X. A Review of Curcumin and Its Derivatives as Anticancer Agents. *Int J Mol Sci*. 2019 Feb 27;20(5).
37. Mansouri K, Rasoulpoor S, Daneshkhan A, et al. Clinical effects of curcumin in enhancing cancer therapy: A systematic review. *BMC Cancer*. 2020 Aug 24;20(1):791.
38. Emadi SA, Ghasemzadeh Rahbardi M, Mehri S, Hosseinzadeh H. A review of therapeutic potentials of milk thistle (*Silybum marianum* L.) and its main constituent, silymarin, on cancer, and their related patents. *Iran J Basic Med Sci*. 2022 Oct;25(10):1166-76.
39. Da J, Xu M, Wang Y, et al. Kaempferol Promotes Apoptosis While Inhibiting Cell Proliferation via Androgen-Dependent Pathway and Suppressing Vasculogenic Mimicry and Invasion in Prostate Cancer. *Anal Cell Pathol (Amst)*. 2019;2019:1907698.
40. Zhang Y, Chen J, Fang W, et al. Kaempferol suppresses androgen-dependent and androgen-independent prostate cancer by regulating Ki67 expression. *Mol Biol Rep*. 2022 Jun;49(6):4607-17.
41. Lambrianidou A, Koutsogianni F, Papapostolou I, Dimas K. Recent Advances on the Anticancer Properties of Saffron (*Crocus sativus* L.) and Its Major Constituents. *Molecules*. 2020 Dec 27;26(1).
42. Vago R, Trevisani F, Vignolini P, et al. Evaluation of anti-cancer potential of saffron extracts against kidney and bladder cancer cells. *Food Bioscience*. 2024 2024/02/01;57:103501.
43. Vago R, Trevisani F, Vignolini P, et al. Evaluation of anti-cancer potential of saffron extracts against kidney and bladder cancer cells. *Food Bioscience*. 2023 12/01;57:103501.
44. Siddique AB, Ebrahim HY, Tajmim A, et al. Oleocanthal Attenuates Metastatic Castration-Resistant Prostate Cancer Progression and Recurrence by Targeting SMYD2. *Cancers (Basel)*. 2022 Jul 21;14(14):3542.
45. Zubair H, Bhardwaj A, Ahmad A, et al. Hydroxytyrosol Induces Apoptosis and Cell Cycle Arrest and Suppresses Multiple Oncogenic Signaling Pathways in Prostate Cancer Cells. *Nutr Cancer*. 2017 Aug-Sep;69(6):932-42.
46. Antoniou C, Hull J. The Anti-cancer Effect of *Olea europaea* L. Products: a Review. *Curr Nutr Rep*. 2021 Mar;10(1):99-124.
47. Zhu Y, Wu J, Li S, et al. Apigenin inhibits migration and invasion via modulation of epithelial mesenchymal transition in prostate cancer. *Mol Med Rep*. 2015 Feb;11(2):1004-8.
48. Hnit SST, Yao M, Xie C, et al. Apigenin impedes cell cycle progression at G(2) phase in prostate cancer cells. *Discov Oncol*. 2022 Jun 7;13(1):44.
49. Available at: <https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/>. Accessed January 4, 2024.
50. Available at: <https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-and-cholesterol/types-of-fat/omega-3-fats/#:~:text=What%20makes%20omega%2D3%20fats,of%20artery%20walls%2C%20and%20inflammation>. Accessed January 4, 2024.
51. Freitas RDS, Campos MM. Protective Effects of Omega-3 Fatty Acids in Cancer-Related Complications. *Nutrients*. 2019 Apr 26;11(5).
52. He K, Hu H, Ye S, et al. The effect of metformin therapy on incidence and prognosis in prostate cancer: A systematic review and meta-analysis. *Sci Rep*. 2019 Feb 18;9(1):2218.
53. Keerthana CK, Rayginia TP, Shifana SC, et al. The role of AMPK in cancer metabolism and its impact on the immunomodulation of the tumor microenvironment. *Front Immunol*. 2023;14:1114582.
54. Choi YK, Park KG. Metabolic roles of AMPK and metformin in cancer cells. *Mol Cells*. 2013 Oct;36(4):279-87.
55. Available at: <https://www.cancer.gov/about-cancer/causes-prevention/risk>. Accessed January 24, 2024.





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#### References:

1. *Crit Rev Food Sci Nutr*. 2023 5 2:1-19.
2. *PLoS One*. 2015;10(11):e0140963.
3. *Phytother Res*. 2021 10;35(10):5440-5458.
4. *J Oral Maxillofac Pathol*. 2020 May-Aug;24(2):405.

5. *Mol Nutr Food Res*. 2018 Sep;62(18):e1700980
6. Supplier Internal Data. Data on File. 2023.
7. *Biochem J*. 1999 8 1;341 (Pt 3):725-32.

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# In the News



## Taurine Ranked as Top Supplement

Longevity and regenerative medicine doctor Neil Paulvin identified **taurine** as the top anti-aging supplement in an article published on CNBC.<sup>1</sup> He said he has been taking it daily for the past several years and has noticed its benefits.

Taurine is one of the most abundant amino acids in the body. It is found in most tissues, including the heart, liver, kidneys, and brain. Its presence in these areas helps promote a healthy heart and brain, cell membrane stability, healthy insulin response and nervous system function, and more.<sup>2</sup>

Studies show that taurine promotes vasodilation, which helps improve blood flow and reduces blood pressure levels. It helps the body's mitochondria function properly. It can also boost brain function, support healthy muscles, and help repair DNA damage.

One population study of 25 countries found that people living in Okinawa, Japan, had the highest intake of taurine.<sup>2</sup> They also had the *lowest rate of heart disease* among the countries studied—and the longest lifespan.

Although the body produces a small amount of taurine, production declines with age and is insufficient to maintain optimal health.<sup>3</sup>

**Editor's Note:** "I personally take about **2,000 mg** per day," Dr. Paulvin said, "but for those new to taurine supplements, I recommend starting with a lower dosage—around **500** to **1,000 mg**—and then working your way up. Of course, it's always best to consult with a physician before starting any new supplement."<sup>1</sup>

### References

1. Available at: <https://www.cnbc.com/2023/10/27/longevity-doctor-says-this-is-the-no-1-supplement-he-takes-every-day-to-slow-down-aging.html>. Accessed January 22, 2024
2. *Adv Exp Med Biol.* 2009;643:13-25.
3. *Mol Med Rep.* 2021 8;24(2):605.

## Omega-3 Helps Support Healthy Inflammatory Response in Long-Distance Runners

Intake of omega-3 fatty acids by long-distance runners offers protection against an increased inflammatory response to exercise-induced injury, a recent study found.\* The authors noted that marathon runners are at risk of muscle injury and heart arrhythmias and dysfunction.

The study included 24 long-distance runners who received **3,000 mg** omega-3 fatty acids or a placebo daily for three weeks. Cardiac markers and inflammatory cytokines were measured in blood obtained before, immediately after, one hour after, and 24 hours after exercise tests that were conducted prior to and at the end of the three-week treatment period.

In the **omega-3** group, the Omega-3 Index, erythrocyte membrane omega-3 and HDL levels were higher, and triglycerides were lower after three weeks, compared with before the treatment period. Following treatment, in this group, compared to post-exercise levels measured prior to the treatment period, inflammation mediators and markers of cardiac damage were lower and adiponectin increased following the exercise test.

**Editor's Note:** Research has found that endurance training is associated with a reduction in erythrocyte (red blood cell) omega-3 fatty acids. Omega-6 polyunsaturated fatty acid-derived lipid mediators released in response to exercise-induced muscle damage promote inflammation. Additionally, indicators of cardiac damage increase following marathon participation. Although these markers return to normal within 48 hours, repetitive increases may have long-term adverse effects.

\* *J Hum Kinet.* 2023 Oct 27;89:123-138.





## Vitamin B6 Reduces Adverse Reactions from *H. pylori* Treatment

Findings from a recent clinical trial suggest that vitamin B6 could help decrease adverse reactions associated with the main eradication therapy for *Helicobacter pylori* (*H. pylori*) infection.\*

The two-week trial included 280 men and women diagnosed with *H. pylori*. Half of the participants were randomized to receive the standard “quadruple therapy treatment” which consists of a proton pump inhibitor, a bismuth agent, tetracycline, and metronidazole. The other 130 participants received the same treatment with the addition of **20 mg** of vitamin B6 twice per day. At the end of the treatment period, participants were given a breath test to determine whether treatment for *H. pylori* was successful.

The percentages of *H. pylori* eradication in each group were statistically similar. But while **74.62%** of the group that received *H. pylori* treatment alone experienced adverse reactions, these effects occurred among only **56.92%** of those whose treatment was combined with vitamin B6. Dizziness, headache, and loss of muscle coordination occurred in **58.7%** of the group that did not receive vitamin B6 and in only **14.63%** of the B6 group. None of those who received B6 experienced any moderate or severe gastrointestinal symptoms, compared with a third of the group that did not receive the vitamin.

**Editor’s Note:** “*H. pylori* infection is one of the most common bacterial infections, affecting approximately **50%** of the global population,” the authors stated.

\* *BMC Infect Dis.* 2023 Sep 11;23(1):590.

## Coffee, Tea Drinking at Midlife Linked with Less Frailty in Later Years

A study revealed an association between drinking coffee or tea during middle-age and less physical frailty in older age, in a dose-response relationship.\*

The study included 12,583 men and women, average age 53 on enrollment, from 1993–1998. Questionnaires obtained information concerning their intake of caffeinated beverages. Participants were weighed at the second follow-up, during 2006–2010. At the third follow-up, during 2014–2017, energy levels and handgrip strength were evaluated and timed up-and-go testing was conducted.

The results showed that the odds of physical frailty at the third year follow-up were **46%** lower for coffee drinkers compared to the odds of frailty in those who drank no coffee. The odds of frailty were also **18%** lower among daily tea drinkers compared to the odds of frailty in those who consumed it less than once a month.

**Editor's Note:** "...physical frailty was assessed using a modified version of the Cardiovascular Health Study frailty phenotype that included weight loss, exhaustion, slowness, and weakness," the authors stated.

\* *J Am Med Dir Assoc.* 2023 Jul 21:S1525-8610(23)00575-3.





## Iron Deficiency, Iron-Deficiency Anemia Prevalent in U.S. Females 12-21

A recent study found that the prevalence of iron deficiency and anemia in teen girls and young women is high enough to warrant routine screening of this group for these conditions. Iron deficiency is not routinely checked in this age group and instead, only non-pregnant female adolescents and women are screened every 5-10 years for anemia by measuring hemoglobin.\*

The study was comprised of 3,490 girls and women aged 12–21 who were enrolled in the National Health and Nutrition Examination Survey (NHANES). Iron deficiency was defined as a ferritin level of less than **25 mcg/L** and iron-deficiency anemia was defined as ferritin of less than **25 mcg/L** and hemoglobin of less than **12 mg/dL**.

Iron deficiency was found in **38.6%** of the group, and **6.3%** had iron-deficiency anemia. While menstruation was a risk factor for both conditions, over **25%** of the girls who were not yet menstruating were deficient.

**Editor's Note:** "Although screening for anemia by measurement of hemoglobin level is recommended, there is benefit in identifying and treating iron deficiency in those without anemia because supplementation improves exercise performance and reduces fatigue, and iron deficiency is associated with increased all-cause mortality," the authors wrote.

\* *JAMA*. 2023 Jun 27;329(24):2191-2193.



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#### References

1. *Med Res Rev.* 2019;39(5):1851-1891.
2. *ACS Omega.* 2022 Apr 19;7(15):12835-45.

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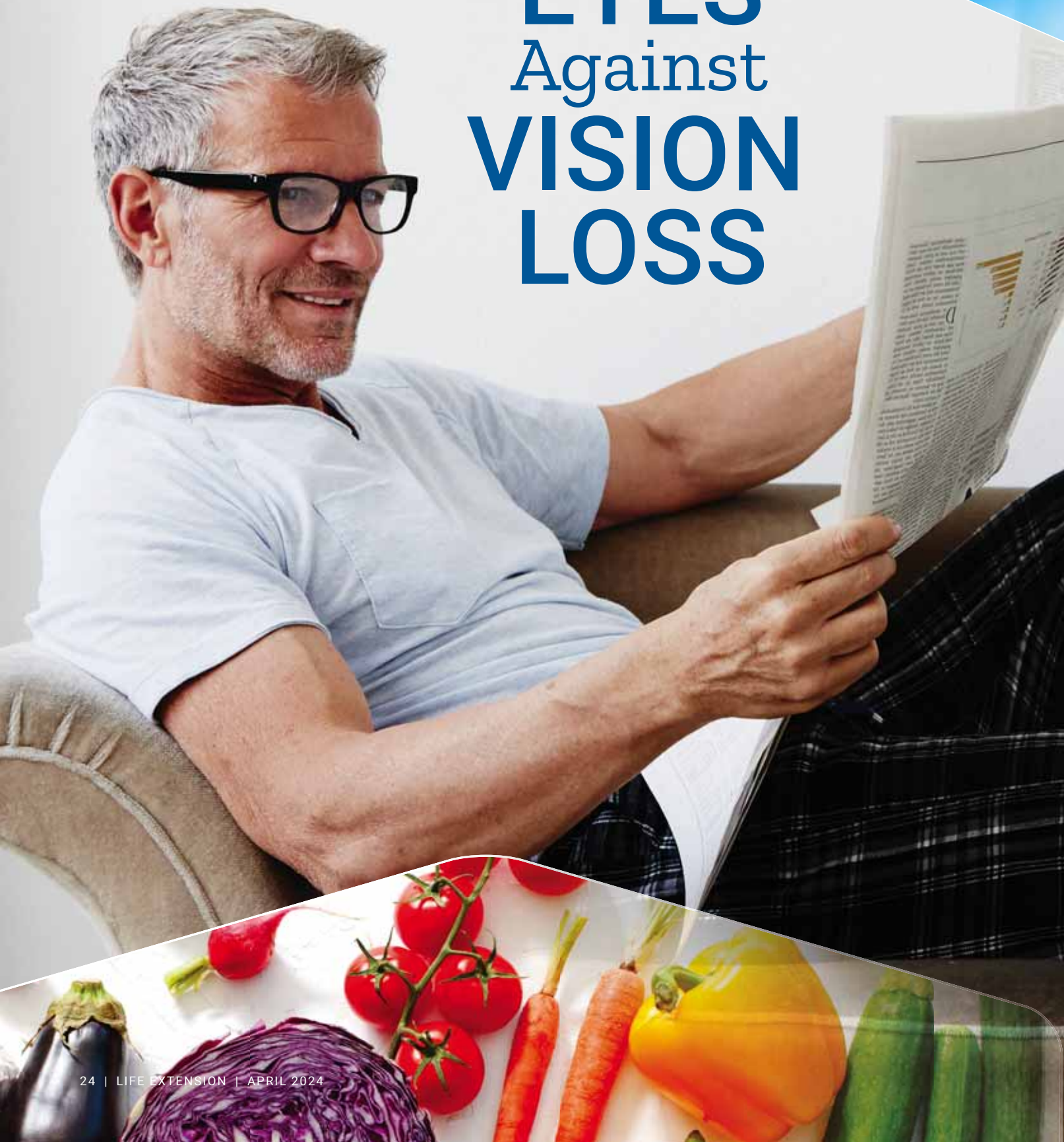
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# Protect Your **EYES** Against **VISION LOSS**





BY JOSEPH LICHT

Every day, your **eyes** are bombarded by various harmful biological and environmental factors.

Ultraviolet light, oxidative stress, and high blood sugar are among the most damaging causes of premature ocular disorders.<sup>1</sup>

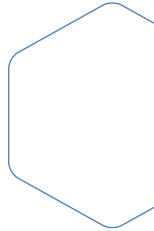
Two carotenoid pigments, **lutein** and **zeaxanthin**, protect eye tissues from multiple types of injury.<sup>2-6</sup>

Humans cannot make **carotenoids**.<sup>7</sup> Modern diets don't always provide enough for optimal protection.<sup>8,9</sup>

The importance of **lutein** and **zeaxanthin** cannot be overlooked.

They are capable of guarding against drivers of age-related visual loss, including **macular degeneration, diabetic retinopathy, cataracts, and glaucoma**.<sup>10-14</sup>

Intake of abundant amounts of a range of carotenoids is one of the healthiest proactive steps you can take to maintain vision.



## Support Healthy Vision

Eyes *actively* take up **lutein** and **zeaxanthin**, concentrating these carotenoids in the retina and other ocular areas.<sup>15-18</sup>

Carotenoids serve multiple purposes. For one, they **filter out** potentially harmful wavelengths of light, capturing their energy and safely dissipating it.<sup>2-6</sup>

Light rays are a form of electromagnetic **radiation** that can inflict significant damage.

Lutein and zeaxanthin protect against the oxidative damage and inflammation that contribute to chronic eye disease, including **cataracts** and **macular degeneration**.<sup>19,20</sup>

**Oral intake** of lutein and zeaxanthin has been shown to *boost* their content in the eyes, protecting against common age-related disorders that cause **vision loss**.

## Age-Related Macular Degeneration

The **macula** is the most important part of the retina. It is where most **photoreceptors** reside and is responsible for crisp, high-resolution vision.

When consumed in adequate amounts, **lutein** and **zeaxanthin** build an effective barrier in a layer of the retina called the **retinal pigment epithelium**. There they help filter out harmful ultraviolet light while reducing oxidative stress and inflammation.

These effects may help prevent the *development* of **macular degeneration**.

One study conducted over more than **20 years** found that people with the *highest* intake of lutein and zeaxanthin have a stunning **41% lower risk** of advanced **macular degeneration**.<sup>21</sup>

In clinical studies, older adults who *already* have macular degeneration, taking **lutein** and **zeaxanthin** has been shown to slow its progression and **improve visual function**, including:<sup>11,16,17,22,23</sup>

- Reducing nighttime glare,
- Improving visual contrast, and
- Boosting visual acuity (sharpness).

Poor **night vision** is a common early warning sign of macular degeneration.<sup>24</sup> In a clinical trial of older adults with poor night vision, daily intake of a **lutein-zeaxanthin** blend *improved* multiple markers of nighttime visual function.<sup>25</sup>



## Cataracts

**Cataract** is the clouding of the lens that is common in older individuals. Diabetes, smoking, and ultraviolet rays from sunlight exposure are also associated with cataract formation.<sup>26</sup> This impedes vision and is the leading cause of **vision loss** in the United States.<sup>27</sup>

Carotenoids can filter out harmful light in the lens. Studies have found that individuals with a *higher* intake of **lutein** have *lower* rates of cataracts.<sup>13</sup>

## Glaucoma

**Glaucoma** can damage the optic nerve, leading to vision loss and blindness in older adults. It is an abnormality of the drainage system of the eyes that causes excess pressure in the eyes due to fluid retention.

A *higher* dietary intake of carotenoids, including **lutein** and **zeaxanthin**, is associated with a *lower* risk of glaucoma.

In human studies a protective trend was observed in individuals consuming *higher* dietary carotenoids who had lower risk of glaucoma.<sup>14</sup> In clinical studies of glaucoma patients, oral intake of carotenoids helps protect against the progression of vision loss and *improves visual performance*.<sup>14,28,29</sup>



## Lutein and Zeaxanthin Guard Against Eye Damage

- Oxidative stress, elevated blood sugar, and ultraviolet light from the sun can damage the eyes.
- With increasing age, damage from these factors accumulates and can lead to eye disease and **vision loss**.
- **Carotenoid** pigments can protect against these factors. They can only be obtained through diet or direct oral intake.
- Studies show that higher intake of the carotenoids **lutein** and **zeaxanthin** improves visual function and helps reduce the development and progression of **macular degeneration**, **cataracts**, **glaucoma**, and other disorders.



WHAT  
YOU  
NEED  
TO  
KNOW

### Diabetic Eye Disease

Diabetic **retinopathy**, eye disease resulting from poor blood glucose control, has become one of the most common causes of vision loss.

Patients with diabetic eye disease typically have *lower* levels of **lutein** and **zeaxanthin** than healthy adults. In these patients, taking carotenoids *improves* visual function, boosting **visual clarity** and **contrast**.<sup>14,30</sup>

### Digital Eye Strain

LED lights and screens emit much more harmful blue light than natural sunlight.<sup>31</sup>

While most eye damage accumulates over time, chronic long exposure to digital screens can also cause short-term symptoms known as **digital eye strain**.<sup>32</sup>

These symptoms may include blurred vision, headaches, dry eyes, neck, shoulder, and back pain. An estimated **six out of 10** people in the U.S. suffer from some of these symptoms.<sup>32</sup>

**Lutein** and **zeaxanthin** act as a **blue light filter** in the eyes, safely absorbing the wavelengths associated with long hours spent looking at digital displays.<sup>3-5</sup>

### Summary

Oral intake of carotenoids can help reduce the risk of long-term vision loss and eye disease, and protect the eyes from modern digital eye strain.

Free radical stress, high blood sugar, and ultraviolet light damage eye tissues and can lead to vision loss.

Consumed orally, the carotenoids **lutein** and **zeaxanthin** are taken up by eye tissues to act as shields against these damaging factors.

Studies show that increasing levels of these carotenoids can improve visual function while defending against the development and progression of **macular degeneration**, **cataracts**, **glaucoma**, and other eye diseases. •

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

## References

- Available at: <https://www.cdc.gov/visionhealth/basics/ced/index.html>. Accessed January 19, 2024.
- Bian Q, Gao S, Zhou J, et al. Lutein and zeaxanthin supplementation reduces photooxidative damage and modulates the expression of inflammation-related genes in retinal pigment epithelial cells. *Free Radic Biol Med*. 2012 Sep 15;53(6):1298-307.
- Johra FT, Bepari AK, Bristy AT, Reza HM. A Mechanistic Review of beta-Carotene, Lutein, and Zeaxanthin in Eye Health and Disease. *Antioxidants (Basel)*. 2020 Oct 26;9(11).
- Kijlstra A, Tian Y, Kelly ER, Berendschot TT. Lutein: more than just a filter for blue light. *Prog Retin Eye Res*. 2012 Jul;31(4):303-15.
- Loskutova E, Nolan J, Howard A, Beatty S. Macular pigment and its contribution to vision. *Nutrients*. 2013 May 29;5(6):1962-9.
- Xue C, Rosen R, Jordan A, Hu DN. Management of Ocular Diseases Using Lutein and Zeaxanthin: What Have We Learned from Experimental Animal Studies? *J Ophthalmol*. 2015;2015:523027.
- Eggersdorfer M, Wyss A. Carotenoids in human nutrition and health. *Arch Biochem Biophys*. 2018 Aug 15;652:18-26.
- Bohm V, Lietz G, Olmedilla-Alonso B, et al. From carotenoid intake to carotenoid blood and tissue concentrations - implications for dietary intake recommendations. *Nutr Rev*. 2021 Apr 7;79(5):544-73.
- Stringham JM, Stringham NT. Serum and retinal responses to three different doses of macular carotenoids over 12 weeks of supplementation. *Exp Eye Res*. 2016 Oct;151:1-8.
- Agron E, Mares J, Clemons TE, et al. Dietary Nutrient Intake and Progression to Late Age-Related Macular Degeneration in the Age-Related Eye Disease Studies 1 and 2. *Ophthalmology*. 2021 Mar;128(3):425-42.
- Lem DW, Davey PG, Gierhart DL, Rosen RB. A Systematic Review of Carotenoids in the Management of Age-Related Macular Degeneration. *Antioxidants (Basel)*. 2021 Aug 5;10(8).
- Ma L, Hao ZX, Liu RR, et al. A dose-response meta-analysis of dietary lutein and zeaxanthin intake in relation to risk of age-related cataract. *Graefes Arch Clin Exp Ophthalmol*. 2014 Jan;52(1):63-70.
- Manayi A, Abdollahi M, Raman T, et al. Lutein and cataract: from bench to bedside. *Crit Rev Biotechnol*. 2016 Oct;36(5):829-39.
- Lem DW, Gierhart DL, Davey PG. A Systematic Review of Carotenoids in the Management of Diabetic Retinopathy. *Nutrients*. 2021 Jul 16;13(7).
- Harrison EH. Mechanisms of Transport and Delivery of Vitamin A and Carotenoids to the Retinal Pigment Epithelium. *Mol Nutr Food Res*. 2019 Aug;63(15):e1801046.
- Huang YM, Dou HL, Huang FF, et al. Effect of supplemental lutein and zeaxanthin on serum, macular pigmentation, and visual performance in patients with early age-related macular degeneration. *Biomed Res Int*. 2015;2015:564738.
- Huang YM, Dou HL, Huang FF, et al. Changes following supplementation with lutein and zeaxanthin in retinal function in eyes with early age-related macular degeneration: a randomised, double-blind, placebo-controlled trial. *Br J Ophthalmol*. 2015 Mar;99(3):371-5.
- Stringham JM, O'Brien KJ, Stringham NT. Macular carotenoid supplementation improves disability glare performance and dynamics of photostress recovery. *Eye Vis (Lond)*. 2016;3:30.
- Pelletier AL, Rojas-Roldan L, Coffin J. Vision Loss in Older Adults. *Am Fam Physician*. 2016 Aug 1;94(3):219-26.
- Liu XH, Yu RB, Liu R, et al. Association between lutein and zeaxanthin status and the risk of cataract: a meta-analysis. *Nutrients*. 2014 Jan 22;6(1):452-65.
- Wu J, Cho E, Willett WC, et al. Intakes of Lutein, Zeaxanthin, and Other Carotenoids and Age-Related Macular Degeneration During 2 Decades of Prospective Follow-up. *JAMA Ophthalmol*. 2015 Dec;133(12):1415-24.
- Akuffo KO, Nolan JM, Howard AN, et al. Sustained supplementation and monitored response with differing carotenoid formulations in early age-related macular degeneration. *Eye (Lond)*. 2015 Jul;29(7):902-12.
- Ma L, Dou HL, Huang YM, et al. Improvement of retinal function in early age-related macular degeneration after lutein and zeaxanthin supplementation: a randomized, double-masked, placebo-controlled trial. *Am J Ophthalmol*. 2012 Oct;154(4):625-34 e1.
- Ying GS, Maguire MG, Liu C, et al. Night vision symptoms and progression of age-related macular degeneration in the Complications of Age-related Macular Degeneration Prevention Trial. *Ophthalmology*. 2008 Nov;115(11):1876-82.
- Richer S, Novil S, Gullett T, et al. Night Vision and Carotenoids (NVC): A Randomized Placebo Controlled Clinical Trial on Effects of Carotenoid Supplementation on Night Vision in Older Adults. *Nutrients*. 2021 Sep 14;13(9).
- Available at: <https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/cataracts/causes-cataracts#:~:text=After%20age%2040%2C%20the%20proteins,studying%20exactly%20why%20cataracts%20form>. Accessed January 16, 2024.
- Available at: <https://www.cdc.gov/visionhealth/basics/ced/index.html>. Accessed 01/11/2023.
- Hunter AML, Loskutova E, Lingham G, et al. Higher Macular Pigment Levels are Associated with Better Contrast Sensitivity and Photostress Recovery Time in Patients with Open-Angle Glaucoma Supplemented with Carotenoids. *Investigative Ophthalmology & Visual Science*. 2022;63(7):2699 – A0063-2699 – A0063.
- Loughman J, Loskutova E, Butler JS, et al. Macular Pigment Response to Lutein, Zeaxanthin, and Meso-zeaxanthin Supplementation in Open-Angle Glaucoma: A Randomized Controlled Trial. *Ophthalmol Sci*. 2021 Sep;1(3):100039.
- Hu BJ, Hu YN, Lin S, et al. Application of Lutein and Zeaxanthin in nonproliferative diabetic retinopathy. *Int J Ophthalmol*. 2011;4(3):303-6.
- Available at: <https://www.reviewsce.com/ce/the-lowdown-on-blue-light-good-vs-bad-and-its-connection-to-amd-109744>. Accessed January 22, 2024.
- Available at: <https://thevisioncouncil.org/blog/vision-council-shines-light-protecting-sight-and-health-multi-screen-era>. Accessed April 22, 2022.
- Cort A, Ozturk N, Akpinar D, et al. Suppressive effect of astaxanthin on retinal injury induced by elevated intraocular pressure. *Regul Toxicol Pharmacol*. 2010 Oct;58(1):121-30.
- Kidd P. Astaxanthin, cell membrane nutrient with diverse clinical benefits and anti-aging potential. *Altern Med Rev*. 2011 Dec;16(4):355-64.
- Fernandez-Albarral JA, de Hoz R, Ramirez AI, et al. Beneficial effects of saffron (*Crocus sativus* L.) in ocular pathologies, particularly neurodegenerative retinal diseases. *Neural Regen Res*. 2020 Aug;15(8):1408-16.
- Heitmar R, Brown J, Kyrou I. Saffron (*Crocus sativus* L.) in Ocular Diseases: A Narrative Review of the Existing Evidence from Clinical Studies. *Nutrients*. 2019 Mar 18;11(3).

## Other Compounds That Promote Eye Health

Other nutrients can support eye health, including:

**Astaxanthin**, a carotenoid responsible for the reddish-pink coloration of salmon, flamingos, and crustaceans. It has been found to have protective effects in the eyes and may help prevent the progression of eye disease.<sup>33,34</sup>

**Saffron**, a spice that has been used for centuries, if not longer, for various ailments. It improves visual function and can help improve symptoms of macular degeneration.<sup>35,36</sup>

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#### References:

1. *Mol Med Rep*. 2021 Aug;24(2).
2. *Science*. 2023;380(6649):eabn9257.
3. *Biomol Ther (Seoul)*. 2018 May 1; 6(3):225-41.

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

### References

1. *JAMA Ophthalmol.* 2015;133(12):1415-24.
2. *Nutrients.* 2013 April;5(4):1169-85.
3. *Nutrition.* 2011 Sep;27(9):960-6.
4. *Free Radic Biol Med.* 2012;53(6):1298-307.
5. *J Ophthalmol.* 2015;2015:523027.



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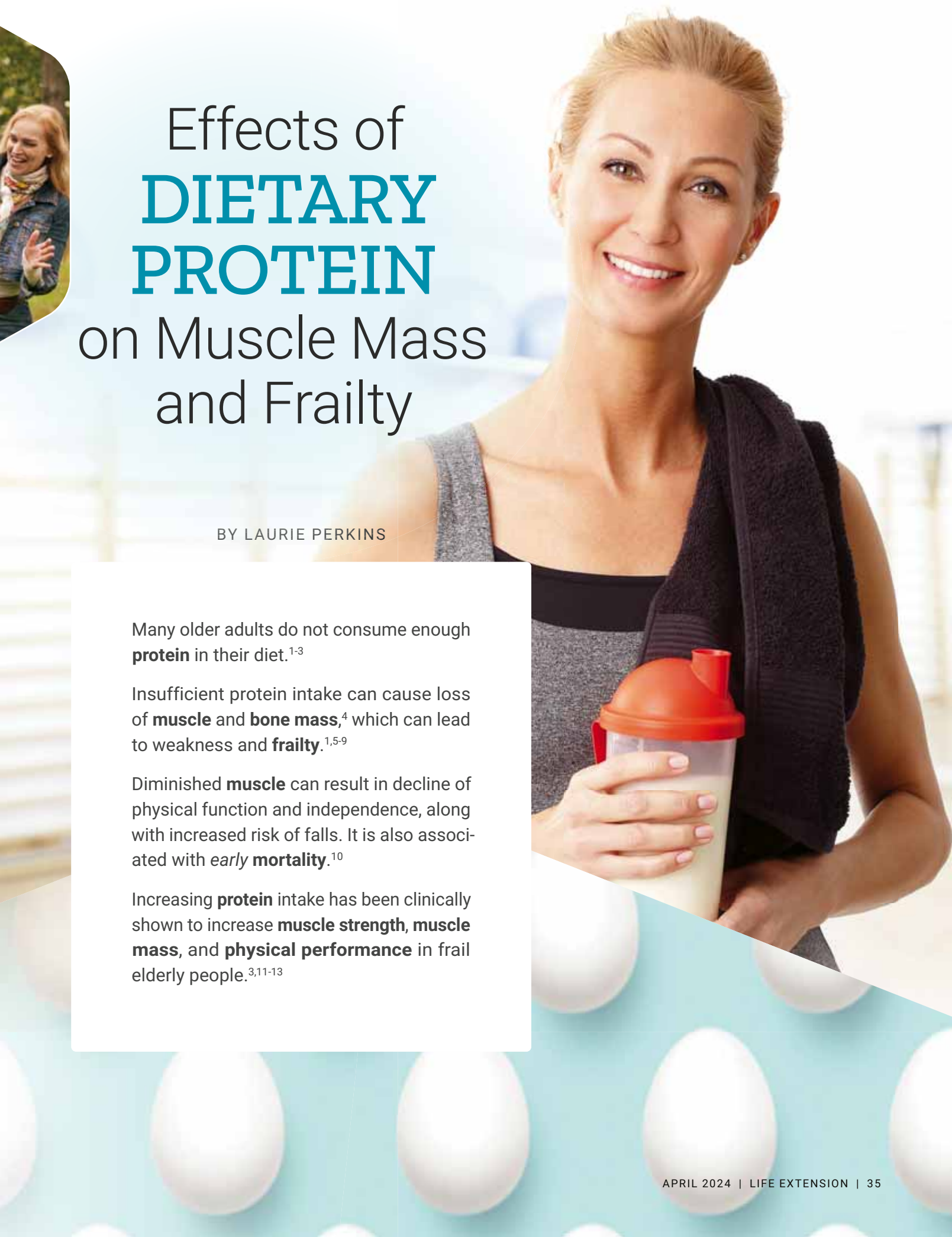
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MacuGuard® Ocular Support with Saffron has met ConsumerLab.com standards for ingredient and product quality for Lutein and Zeaxanthin in independent testing. More information at **www.consumerlab.com**.



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# Effects of **DIETARY PROTEIN** on Muscle Mass and Frailty

BY LAURIE PERKINS

Many older adults do not consume enough **protein** in their diet.<sup>1-3</sup>

Insufficient protein intake can cause loss of **muscle** and **bone mass**,<sup>4</sup> which can lead to weakness and **frailty**.<sup>1,5-9</sup>

Diminished **muscle** can result in decline of physical function and independence, along with increased risk of falls. It is also associated with **early mortality**.<sup>10</sup>

Increasing **protein** intake has been clinically shown to increase **muscle strength**, **muscle mass**, and **physical performance** in frail elderly people.<sup>3,11-13</sup>

## Why We Need Protein

Many people associate protein powders and bars with athletes trying to build muscle. They may not realize that **older adults** also need abundant **protein** to maintain optimal health.<sup>1,5,6,14</sup>

**Proteins** are made of long chains of chemical units called **amino acids**. Cells can produce some of these protein building blocks, but others—termed **essential amino acids**—cannot be synthesized in the human body and must be acquired in the diet.<sup>15</sup>

Proteins serve many purposes. About **50%-70%** of all proteins in the body are found in **muscles**.<sup>4,16</sup>

Studies show that after the age of **30**, muscle is lost at a rate of about **3% to 5%** per decade, and that accelerates with advancing age.<sup>17</sup>

## Dangers of Low Protein Intake

Many older adults are at risk of suboptimal protein nutrition.<sup>3,18,19</sup>

The most profound impact of inadequate protein is on **muscle** and **bone**. With time, too little protein may eventually contribute to:

- **Sarcopenia**, loss of muscle mass and strength,<sup>17,20</sup> and
- **Osteopenia**, loss of bone density and strength.<sup>4,7</sup>

Although loss of muscle mass may be the first thing that comes to mind regarding poor protein intake, bones are also profoundly affected.<sup>4</sup>

Bones require calcium and other nutrients for optimal mineralization, and the scaffolding of bone tissue requires **protein** as well. Maintenance of healthy bone structure requires adequate protein intake, and it suffers when protein availability is insufficient.

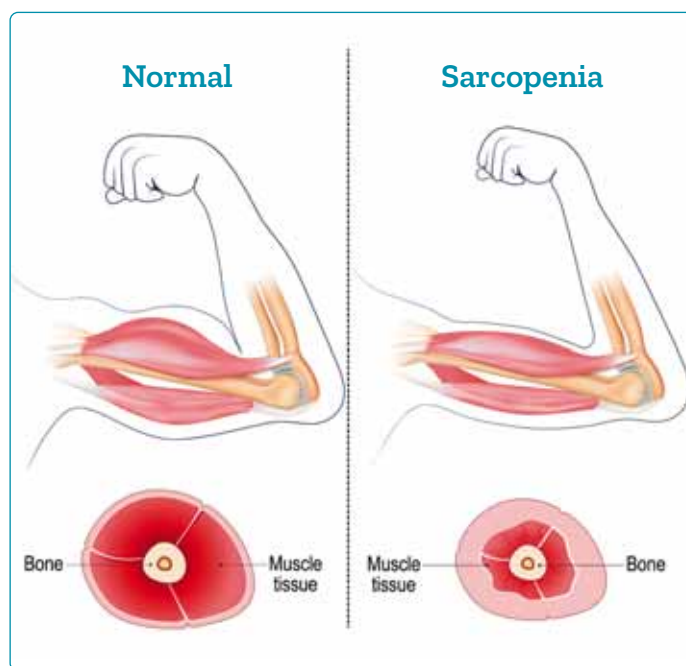
Both sarcopenia and osteopenia can occur without any symptoms in their early stages. But as they progress, they are a major contributor to declining health in older adults.

Loss of muscle and bone are closely associated with **frailty** and **functional disability**.<sup>4,7</sup> Both these conditions are associated with an increased risk of falls, fractures, and other injuries, and increased risk of **death**.

## How Much Do You Need?

Although the official **Recommended Dietary Allowance (RDA)** for protein intake is only **0.8 grams/kg** per day, modern scientific, nutritional, and medical researchers generally agree that for elderly individuals and people with many medical conditions, a correct nutritional target is in the range of **1.0 to 1.5 grams/kg** per day.<sup>3,13,21,22</sup>

A 180-pound older individual concerned about maintaining or building muscle and bone mass should aim for approximately **80 – 120 grams of protein per day**



from diet and protein supplements. Since two scrambled eggs provide only **12 grams** of protein, and a serving of nonfat Greek yogurt delivers just **16 grams**, it is apparent that **protein supplementation** may be crucial for some.

For instance, **whey protein** concentrate powders can deliver **20 grams** of high-quality protein per scoop. This can make a big difference for those having trouble meeting their daily protein quotient.

### Human Studies of Protein Intake

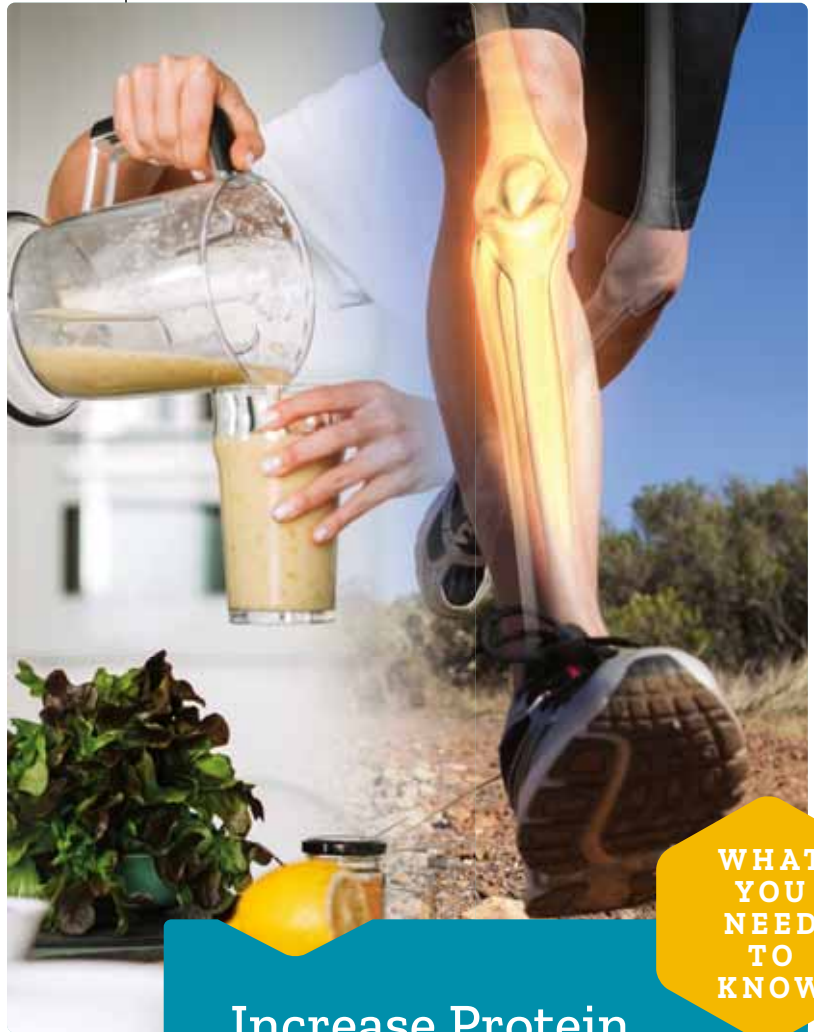
Observational and clinical studies confirm the impact that adequate **protein intake** has on overall health.

These studies have demonstrated benefits of consuming good amounts of protein – and many of these studies used **protein supplementation** to augment dietary intake.<sup>4-7,14,18,20,23-34</sup>

The Framingham Offspring study followed thousands of participants for an extended period of time. Over nine years of observation, individuals who consumed **more protein** were found to maintain a **greater muscle mass**. Moreover, in physically active subjects, *higher* protein intake was linked to an impressive **35% reduction** in risk of **functional decline**.<sup>20</sup>

In a clinical trial, poorly nourished elderly individuals who were frail or prefrail were assigned to protein-supplement interventions that augmented diet to provide **1.2 or 1.5 grams/kg** protein per day. Placebo recipients consumed **0.8 grams/kg/day**, the usual RDA. After 12 weeks, those in the **1.5 gram/kg** group, compared to the **0.8 gram/kg** group, had greater muscle mass in their arms, legs, and body overall, as well as improved walking speed.<sup>13</sup>

Multiple reviews and analyses of the scientific literature have concluded that protein consumption higher than the RDA, in the range of approximately **1.0 – 1.5 grams/kg** of body weight, including through the use of whey protein supplementation, results in better muscle and physical function outcomes. Notably, several of these scientific papers concluded that better **vitamin D** status leads to better results with **dietary protein** optimization.<sup>3,11,12</sup>



WHAT  
YOU  
NEED  
TO  
KNOW

## Increase Protein to Fight Frailty

- Older adults require a good intake of **protein** to support healthy muscles, prevent frailty and functional decline, and support healthy aging.
- Studies show that low protein intake is associated with **frailty**, risk for falls and other injuries, bone fractures, and other negative health outcomes in the elderly.
- Increasing protein intake can help maintain **muscle mass** and **bone density**. That can prevent frailty, loss of function, and other age-related health problems.



## Boost Your Protein Intake

**Protein bars** provide a convenient way to increase daily protein intake.

The problem is that many supposedly “healthy” bars are just candy with a protein serving added.

Some popular bars have as much as **12 grams of sugar** per serving!

When choosing a protein bar, look for one with:

- **No added sugar** and only **1-3 grams** of total sugar,
- A healthy serving of **fiber**, around **8 grams** and,
- At least **12 to 16 grams of protein**.

Many people use whey protein or plant protein powder to increase their daily protein intake.

Look for a protein powder with no artificial sweeteners (stevia is okay) which provides between **18-20 grams** of protein per scoop. These powders can be mixed into numerous recipes or used as a basis for a healthy smoothie.

## Summary

Many older adults consume inadequate amounts of **protein** in their diet.

Low protein intake is associated with loss of **muscle mass** and **strength** in the elderly, along with increased risk for weak bones, falls, and fractures.

Several age-related health issues are also more common with insufficient protein intake, including age-related muscle loss (sarcopenia) and frailty.

Increasing intake of protein in the diet as well as through supplementation has been shown to help support **muscle mass** and physical functioning. Some studies also suggest that proper vitamin D status is essential to reap the benefits of protein nutrition.

This can help ward off functional decline, frailty, and premature death. •

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

## References

1. Krok-Schoen JL, Archdeacon Price A, Luo M, et al. Low Dietary Protein Intakes and Associated Dietary Patterns and Functional Limitations in an Aging Population: A NHANES analysis. *J Nutr Health Aging*. 2019;23(4):338-47.
2. Buhl SF, Beck AM, Christensen B, et al. Prevalence of low protein intake in 80+-year-old community-dwelling adults and association with dietary patterns and modifiable risk factors: a cross-sectional study. *Br J Nutr*. 2022 Jan 28;127(2):266-77.
3. Weiler M, Hertzler SR, Dvoretzky S. Is It Time to Reconsider the U.S. Recommendations for Dietary Protein and Amino Acid Intake? *Nutrients*. 2023 Feb 6;15(4).
4. Genaro Pde S, Martini LA. Effect of protein intake on bone and muscle mass in the elderly. *Nutr Rev*. 2010 Oct;68(10):616-23.
5. Mendonca N, Hengeveld LM, Presse N, et al. Protein intake, physical activity and grip strength in European and North American community-dwelling older adults: a pooled analysis of individual participant data from four longitudinal ageing cohorts. *Br J Nutr*. 2022 Jul 6;129(7):1-26.
6. Mendonca N, Hengeveld LM, Visser M, et al. Low protein intake, physical activity, and physical function in European and North American community-dwelling older adults: a pooled analysis of four longitudinal ageing cohorts. *Am J Clin Nutr*. 2021 Jul 1;114(1):29-41.
7. Paddon-Jones D, Campbell WW, Jacques PF, et al. Protein and healthy aging. *Am J Clin Nutr*. 2015 Jun;101(6):1339S-45S.
8. Coelho-Junior HJ, Rodrigues B, Uchida M, Marzetti E. Low Protein Intake Is Associated with Frailty in Older Adults: A Systematic Review and Meta-Analysis of Observational Studies. *Nutrients*. 2018 Sep 19;10(9).
9. Bauer J, Biolo G, Cederholm T, et al. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *J Am Med Dir Assoc*. 2013 Aug;14(8):542-59.
10. Larsson L, Degens H, Li M, et al. Sarcopenia: Aging-Related Loss of Muscle Mass and Function. *Physiol Rev*. 2019 Jan 1;99(1):427-511.

11. Lancha AH, Jr., Zanella R, Jr., Tanabe SG, et al. Dietary protein supplementation in the elderly for limiting muscle mass loss. *Amino Acids*. 2017 Jan;49(1):33-47.
12. Nasimi N, Sohrabi Z, Nunes EA, et al. Whey Protein Supplementation with or without Vitamin D on Sarcopenia-Related Measures: A Systematic Review and Meta-Analysis. *Adv Nutr*. 2023 Jul;14(4):762-73.
13. Park Y, Choi JE, Hwang HS. Protein supplementation improves muscle mass and physical performance in undernourished prefrail and frail elderly subjects: a randomized, double-blind, placebo-controlled trial. *Am J Clin Nutr*. 2018 Nov 1;108(5):1026-33.
14. Wu G. Dietary protein intake and human health. *Food Funct*. 2016 Mar;7(3):1251-65.
15. Hou Y, Yin Y, Wu G. Dietary essentiality of "nutritionally non-essential amino acids" for animals and humans. *Exp Biol Med (Maywood)*. 2015 Aug;240(8):997-1007.
16. Frontera WR, Ochala J. Skeletal muscle: a brief review of structure and function. *Calcif Tissue Int*. 2015 Mar;96(3):183-95.
17. Available at: <https://www.health.harvard.edu/staying-healthy/preserve-your-muscle-mass>. Accessed December 27, 2023.
18. Volpi E, Campbell WW, Dwyer JT, et al. Is the optimal level of protein intake for older adults greater than the recommended dietary allowance? *J Gerontol A Biol Sci Med Sci*. 2013 Jun;68(6):677-81.
19. Baum JL, Kim IY, Wolfe RR. Protein Consumption and the Elderly: What Is the Optimal Level of Intake? *Nutrients*. 2016 Jun 8;8(6).
20. Bradlee ML, Mustafa J, Singer MR, Moore LL. High-Protein Foods and Physical Activity Protect Against Age-Related Muscle Loss and Functional Decline. *J Gerontol A Biol Sci Med Sci*. 2017 Dec 12;73(1):88-94.
21. Lin CC, Shih MH, Chen CD, Yeh SL. Effects of adequate dietary protein with whey protein, leucine, and vitamin D supplementation on sarcopenia in older adults: An open-label, parallel-group study. *Clin Nutr*. 2021 Mar;40(3):1323-9.
22. Available at: <https://kffhealthnews.org/news/why-older-adults-should-eat-more-protein-and-not-overdo-protein-shakes/>. Accessed January 4, 2024.
23. Appel LJ. The effects of protein intake on blood pressure and cardiovascular disease. *Curr Opin Lipidol*. 2003 Feb;14(1):55-9.
24. Hengeveld LM, Wijnhoven HAH, Olthof MR, et al. Prospective associations of poor diet quality with long-term incidence of protein-energy malnutrition in community-dwelling older adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am J Clin Nutr*. 2018 Feb 1;107(2):155-64.
25. Naghshi S, Sadeghi O, Willett WC, Esmailzadeh A. Dietary intake of total, animal, and plant proteins and risk of all cause, cardiovascular, and cancer mortality: systematic review and dose-response meta-analysis of prospective cohort studies. *BMJ*. 2020 Jul 22;370:m2412.
26. Qi XX, Shen P. Associations of dietary protein intake with all-cause, cardiovascular disease, and cancer mortality: A systematic review and meta-analysis of cohort studies. *Nutr Metab Cardiovasc Dis*. 2020 Jun 25;30(7):1094-105.
27. Tieland M, Dirks ML, van der Zwaluw N, et al. Protein supplementation increases muscle mass gain during prolonged resistance-type exercise training in frail elderly people: a randomized, double-blind, placebo-controlled trial. *J Am Med Dir Assoc*. 2012 Oct;13(8):713-9.
28. Tieland M, van de Rest O, Dirks ML, et al. Protein supplementation improves physical performance in frail elderly people: a randomized, double-blind, placebo-controlled trial. *J Am Med Dir Assoc*. 2012 Oct;13(8):720-6.
29. Wolfe RR. Perspective: Optimal protein intake in the elderly. *J Am Med Dir Assoc*. 2013 Jan;14(1):65-6.
30. Yuan M, Pickering RT, Bradlee ML, et al. Animal protein intake reduces risk of functional impairment and strength loss in older adults. *Clin Nutr*. 2021 Mar;40(3):919-27.
31. Elliott P. Protein intake and blood pressure in cardiovascular disease. *Proc Nutr Soc*. 2003 May;62(2):495-504.
32. Rahimi MH, Shab-Bidar S, Mollahosseini M, Djafarian K. Branched-chain amino acid supplementation and exercise-induced muscle damage in exercise recovery: A meta-analysis of randomized clinical trials. *Nutrition*. 2017 Oct;42:30-6.
33. Martinho DV, Nobari H, Faria A, et al. Oral Branched-Chain Amino Acids Supplementation in Athletes: A Systematic Review. *Nutrients*. 2022 Sep 27;14(19).
34. Zhang S, Zeng X, Ren M, et al. Novel metabolic and physiological functions of branched chain amino acids: a review. *J Anim Sci Biotechnol*. 2017;8:10.



# Feed Your BRAIN!

## Neuro-Mag<sup>®</sup> MAGNESIUM L-THREONATE

**Magnesium** has important functions in *the brain*.<sup>1</sup>

**Neuro-Mag<sup>®</sup>** provides an absorbable form called **Magnesium L-Threonate**.<sup>2-5</sup>

In a clinical study **Magnesium L-Threonate** was shown to improve short-term working **memory** and **cognition**.<sup>3</sup>

**Neuro-Mag<sup>®</sup>** capsules and powder provide a 30-day supply.

The new **sugar-free\*** gummies provide a fun, flavorful option delivering a 15-day supply.



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

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

**Item #02520\***  
60 gummies  
1 jar **\$28.50**  
4 jars \$26 each

**NEW!**

For full product description and to order **Life Extension<sup>®</sup> Neuro-Mag<sup>®</sup> Magnesium L-Threonate**, call **1-800-544-4440** or visit **www.LifeExtension.com**

References:

1. *Nutrients*. 2018 Jun 6;10(6):730.
2. *Nutrients*. 2022 12; 14(24): 5235.
3. *J Alzheimers Dis*. 2016;49(4):971-90.
4. *Innov Aging*. 2017 Jul; 1(Suppl 1): 170
5. *Neuron*. 2010 Jan 28;65(2):165-77.

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\* Not a low-calorie food.

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 with  
the Good

Out with  
the Bad

"I'm happy  
with this  
product!"

**Laura**

VERIFIED CUSTOMER  
REVIEW

# FLORASSIST® GI

for a Healthy Digestion

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

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



**Dual-Encapsulation Delivery**



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

GLUTEN  
FREE

NON  
GMO  
LE CERTIFIED

VEGETARIAN  
LE CERTIFIED

For full product description and to order **FLORASSIST® PROBIOTIC GI with Phage Technology**,  
call **1-800-544-4440** or visit **www.LifeExtension.com**

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# Munch

Crunch Digest Your Lunch  
(Or breakfast, or dinner...)

## Uncomfortable after eating?

Digestive enzymes are specialized proteins that help you break down the foods you eat.

**Enhanced Super Digestive Enzymes** combines 10 vegetarian-friendly enzymes to help you break down hard-to-digest foods and encourage a healthy gastrointestinal balance...so you can feel good after you eat!

**Item #02021** • 60 vegetarian capsules

1 bottle **\$16.50** • 2 bottles \$15.75 each



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

*Contains wheat, soybeans.*

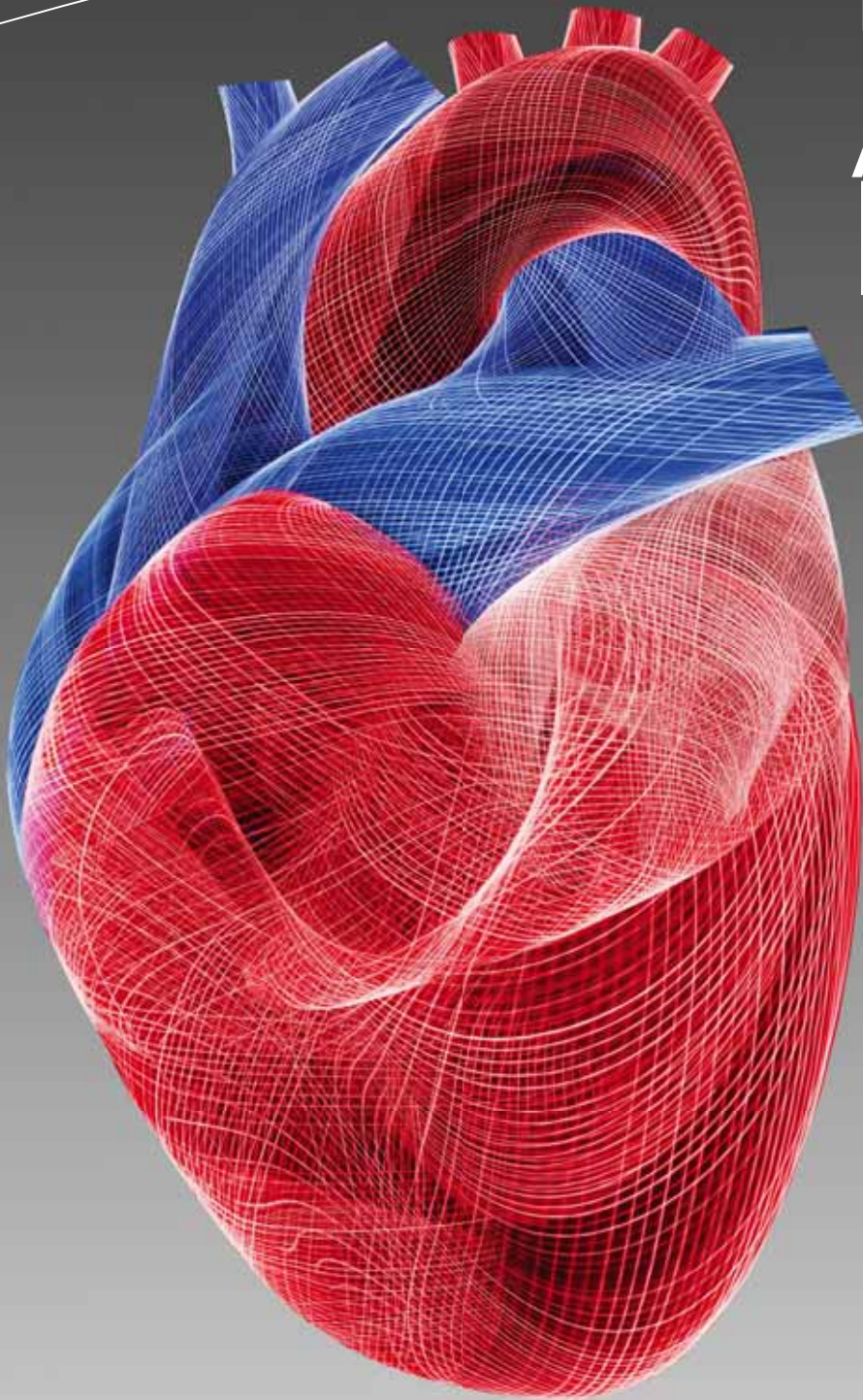
"This product is very good,  
and I will continue with it."

**Eric**

VERIFIED CUSTOMER REVIEW



# Maintain Endothelial Plaque Stability with Arterial Protect



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

Each capsule provides the patented French Maritime **pine bark extract** used in clinical studies along with **Gotu Kola**.

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

Item #02004  
30 vegetarian capsules  
1 bottle **\$33**  
4 bottles \$29 each

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

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# ENERGY FOR Life

Many creatine products are sold on the American market, but the most absorbable form is creatine monohydrate. **Life Extension** offers a creatine supplement that provides energy-boosting effects to cells throughout the body.

**Item #01529 • 120 capsules**

1 bottle **\$13.50** • 4 bottles \$12 each

Each **Creatine Capsule** supplies **500 mg** of easily absorbed creatine monohydrate.



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

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# Support Healthy Immune Function with **WHEY Protein**



(Whey Concentrate)



(Whey Isolate)



(Whey + Creatine + Glutamine)

"Very good  
and easy  
to take."

**Matthew**

VERIFIED CUSTOMER  
REVIEW

**Whey protein**, packed with vital amino acids, promotes **glutathione** synthesis.<sup>1,2</sup>

**Glutathione** plays an important role in supporting **immune** balance in the body.<sup>1,2</sup>

Whey fractions help modulate a full range of healthy bodily functions.<sup>1-5</sup>

#### References

1. *J Food Sci Technol*. 2015 Nov;52(11):6847-58.
2. *Nutrients*. 2019 Sep 3;11(9).
3. *Aging Dis*. 2018 Feb;9(1):119-32.
4. *Aging Dis*. 2019 Feb;10(1):157-73.
5. *J Food Sci*. 2015 Mar;80 Suppl 1:A8-a15.

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

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

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



## Choose the Best Whey for You!

### ➔ **WHEY PROTEIN CONCENTRATE** (chocolate or vanilla flavor)

Pure whey with the water removed.  
Contains 80% easy-to-digest protein.

Item #02260 Vanilla

**1 container \$27.75 • 2 containers \$25 each**

Item #02261C Chocolate

**1 container \$30 • 2 containers \$26 each**

### ➔ **WHEY PROTEIN ISOLATE** (chocolate or vanilla flavor)

Filtered to reduce carbohydrates, lactose and fat.  
Contains 98% protein with some lactose.

Item #02242 Vanilla\*

**1 container \$27 • 2 containers \$25 each**

Item #02243 Chocolate\*

**1 container \$29.25 • 2 containers \$27 each**

### ➔ **ADVANCED WHEY PROTEIN ISOLATE with GLUTAMINE and CREATINE**

A premium isolate for greater strength and exercise performance.

Item #02246C Vanilla\*

**1 container \$28.50 • 2 containers \$26 each**

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.

# REDUCE NIGHTTIME BATHROOM VISITS





BY MICHAEL DOWNEY

At least **half** of all men over **age 50** wake up once or more during the night to **urinate**.<sup>1</sup>

The need to urinate twice or more nightly increases with age, affecting up to **62%** of those aged 70-80.<sup>2</sup>

Known as **nocturia**, waking to use the bathroom at night is one of the most common **lower urinary tract symptoms** in older men. It disrupts sleep and can leave people exhausted and irritable.<sup>3</sup>

Many men assume it's an inevitable part of aging. But it doesn't have to be.

A clinical study by **Life Extension** scientists combined **five** compounds that have shown beneficial effects on **nocturia** and other urinary tract issues.

At the end of the study, not a single participant was left waking at night more than once. And the number of men suffering from nocturia at all dropped by an astonishing **64%**.<sup>4</sup>

## Nocturia and Other Male Urinary Symptoms

Prevalence of nocturia increases with age.<sup>3</sup>

It is just one of many urinary problems, known as **lower urinary tract symptoms** (or **LUTS**), that plague aging men.<sup>5</sup>

Others include increased urinary frequency, urgency, incontinence, incomplete bladder emptying, hesitancy, prolonged urination, dribbling, and a weak urine stream.<sup>5</sup>

Many changes that occur with age drive these symptoms, including enlargement of the **prostate gland** or **overactive bladder**.<sup>5</sup>

## Five Helpful Compounds

Some drugs are meant to control bladder overactivity and urine-flow problems. However, they are more effective in controlling daytime symptoms and have little impact on **nocturia**.<sup>6</sup>

To identify a possible solution, **Life Extension** scientists reviewed substances previously shown to help **reduce nocturia**.

They selected **five** ingredients with the most potential to help men with nocturia:<sup>4</sup>

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

## BETA-SITOSTEROL

The compound **beta-sitosterol** is isolated from certain nut and vegetable oils.

Preclinical evidence shows that it has a broad range of **anti-inflammatory** properties.<sup>7-10</sup>

In animal studies, beta-sitosterol inhibits an enzyme in the prostate gland that converts testosterone to **dihydrotestosterone**, a growth-promoting hormone that drives **prostate enlargement**.<sup>11</sup>

In a study of men with enlarged prostates, **beta-sitosterol**:<sup>12</sup>

- Reduced urinary symptom severity by **50%**, and
- Improved quality-of-life scores by **42%**.

## PYGEUM BARK EXTRACT

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

Since the **1970s**, men in France with **benign prostatic hypertrophy (BPH)**, enlargement of the prostate, have been given pygeum extract.<sup>13</sup> It is used today to treat BPH-related lower urinary tract symptoms.<sup>14</sup>

Studies show that **pygeum bark extract** helps:<sup>13,15-19</sup>

- Control bladder overactivity,
- Reduce prostate enlargement, and
- Improve nocturia.

In one clinical trial, pygeum extract led to a **32% reduction** in the frequency of nighttime urination.<sup>20</sup>



## LYCOPENE

A carotenoid pigment found in tomatoes and some other plants, **lycopene** is a well-known **anti-inflammatory** and **antioxidant**.<sup>21</sup>

By naturally concentrating in the **prostate** gland, lycopene can deliver its anti-inflammatory effects *exactly* where needed to help reduce nocturia.<sup>22</sup>

Preclinical evidence suggests that lycopene may inhibit prostate enlargement due to its **antiproliferative** properties, which help prevent abnormal growth of cells. Lab studies show that lycopene slows down prostate-cell division.<sup>23</sup>

Other preclinical research has shown that lycopene may benefit prostate health by improving androgen receptor signaling.<sup>24</sup>

In a clinical trial, giving lycopene-rich tomato products to prostate cancer patients significantly decreased **PSA (prostate-specific antigen)** levels. These levels rise as the prostate enlarges or develops malignant cells.<sup>25</sup>

## BORON

The mineral **boron** offers layers of protection by:

- Reducing markers of inflammation,<sup>26</sup>
- Modulating sex-hormone production and reducing the impact of growth factors that may contribute to prostate enlargement,<sup>26</sup> and
- Blocking growth factors necessary for **tumor** development.<sup>27</sup>

Boron given to mice in which human prostate tumors had been implanted *reduced* those tumors by **38%** and lowered serum PSA levels by **89%**.<sup>27</sup>

Compared to those with the lowest dietary **boron** intake, men with the *highest* intake have a **54% lower** risk of **prostate cancer**.<sup>28</sup>

## MELATONIN

The hormone **melatonin** is often taken to improve sleep.<sup>29</sup>

While a need to urinate can cause men to wake up, men occasionally get up to urinate simply because their sleep is *already* disrupted.<sup>30</sup>

Melatonin also has potent **anti-inflammatory** effects and may reduce oxidative stress and blood pressure.<sup>31-33</sup>

In men suffering from **severe nocturia**, defined as waking on average three times a night to urinate, **2 mg** of **melatonin** before bed improved symptoms.<sup>34</sup> In one study, it reduced frequency of nighttime urination from an average of **3.4 times** to **2.6 times**.<sup>35</sup>



WHAT  
YOU  
NEED  
TO  
KNOW

## Relief for Nocturia

- The need to wake up once or more nightly to urinate, known as **nocturia**, is common in men over 50.
- A specific combination of five ingredients—**beta-sitosterol**, **pygeum bark extract**, **lycopene**, **boron**, and **melatonin**—has been shown to reduce nighttime urination frequency.
- In a clinical trial, a combination of these compounds reduced nocturia in **64%** of study subjects. *No* men were left waking more than once a night.



Pygeum bark



### An Effective Combination

**Life Extension** scientists conducted a pilot clinical study to test whether a **combination** of these compounds could reduce nighttime urination.<sup>4</sup>

Results were published in the journal *Global Advances in Health and Medicine*.

Every night before bedtime, 30 healthy men with mild **lower urinary tract symptoms**, aged 45 to 75 years, took a single capsule that contained a blend of:

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

At baseline, **87%** of participants reported *some* degree of **nocturia**. After **60 days** of treatment, only **23%** still reported any nocturia—a reduction of **64%**.

Even in the **37%** of men with **severe nocturia** – those who, before treatment, were waking two to three times nightly – the formula reduced the symptoms so that they were at a mild level only. That means **all men** suffering from **severe nocturia** had a substantial reduction in symptoms.

In fact, after treatment, **no participants** in the study woke up more than once a night.

This study demonstrated how powerful this nutrient combination is for reducing or relieving nocturia symptoms in men, leading to improvements in sleep and quality of life.

### Summary

**Nocturia** is a major quality-of-life issue in aging men.

In a clinical study, a blend of **beta-sitosterol**, **pygeum bark extract**, **lycopene**, **boron**, and **melatonin** significantly reduced the frequency of nighttime urination.

The number of men suffering from nocturia *at all* was reduced by **64%**, and no one was left waking more than **once** a night. •

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

### References

1. Miranda Ede P, Gomes CM, Torricelli FC, et al. Nocturia is the Lower Urinary Tract Symptom With Greatest Impact on Quality of Life of Men From a Community Setting. *Int Neurol J*. 2014 Jun;18(2):86-90.
2. Oelke M, De Wachter S, Drake MJ, et al. A practical approach to the management of nocturia. *Int J Clin Pract*. 2017 Nov;71(11).
3. Available at: <https://www.uptodate.com/contents/nocturia-clinical-presentation-evaluation-and-management-in-adults>. Accessed January 23, 2024.
4. Hirsh SP, Pons M, Joyal SV, Swick AG. Self-Assessed Benefits of a Prostate Health Formulation on Nocturia in Healthy Males With Mild Lower Urinary Tract Symptoms: An Open Label Study. *Glob Adv Health Med*. 2020;9:2164956120973639.
5. Available at: <https://www.uptodate.com/contents/lower-urinary-tract-symptoms-in-males>. Accessed January 23, 2024.
6. Andersson KE, Van Kerrebroeck P. Pharmacotherapy for Nocturia. *Curr Urol Rep*. 2018 Feb 9;19(1):8.
7. Loizou S, Lekakis I, Chrousos GP, Moutsatsou P. Beta-sitosterol exhibits anti-inflammatory activity in human aortic endothelial cells. *Mol Nutr Food Res*. 2010 Apr;54(4):551-8.
8. Paniagua-Perez R, Flores-Mondragon G, Reyes-Legorreta C, et al. Evaluation of the Anti-Inflammatory Capacity of Beta-Sitosterol in Rodent Assays. *Afr J Tradit Complement Altern Med*. 2017;14(1):123-30.

9. Sun Y, Gao L, Hou W, Wu J. beta-Sitosterol Alleviates Inflammatory Response via Inhibiting the Activation of ERK/p38 and NF-kappaB Pathways in LPS-Exposed BV2 Cells. *Biomed Res Int*. 2020;2020:7532306.
10. Valerio M, Awad AB. beta-Sitosterol down-regulates some pro-inflammatory signal transduction pathways by increasing the activity of tyrosine phosphatase SHP-1 in J774A.1 murine macrophages. *Int Immunopharmacol*. 2011 Aug;11(8):1012-7.
11. Cabeza M, Bratoeff E, Heuze I, et al. Effect of beta-sitosterol as inhibitor of 5 alpha-reductase in hamster prostate. *Proc West Pharmacol Soc*. 2003;46:153-5.
12. Berges RR, Windeler J, Trampisch HJ, Senge T. Randomised, placebo-controlled, double-blind clinical trial of beta-sitosterol in patients with benign prostatic hyperplasia. Beta-sitosterol Study Group. *Lancet*. 1995 Jun 17;345(8964):1529-32.
13. Andro M-C, Riffaud J-P. Pygeum africanum extract for the treatment of patients with benign prostatic hyperplasia: A review of 25 years of published experience. *Current Therapeutic Research*. 1995 1995/08/01;56(8):796-817.
14. Salinas-Casado J, Esteban-Fuertes M, Carballido-Rodriguez J, Cozar-Olmo JM. Review of the experience and evidence of Pygeum africanum in urological practice. *Actas Urol Esp (Engl Ed)*. 2020 Jan-Feb;44(1):9-13.
15. Wilt T, Ishani A, Mac Donald R, et al. Pygeum africanum for benign prostatic hyperplasia. *Cochrane Database Syst Rev*. 2002;1998(1):CD001044.
16. Ishani A, MacDonald R, Nelson D, et al. Pygeum africanum for the treatment of patients with benign prostatic hyperplasia: a systematic review and quantitative meta-analysis. *Am J Med*. 2000 Dec 1;109(8):654-64.
17. Quiles MT, Arbós MA, Fraga A, et al. Antiproliferative and apoptotic effects of the herbal agent Pygeum africanum on cultured prostate stromal cells from patients with benign prostatic hyperplasia (BPH). *Prostate*. 2010 Jul 1;70(10):1044-53.
18. Larré S, Camparo P, Comperat E, et al. Biological effect of human serum collected before and after oral intake of Pygeum africanum on various benign prostate cell cultures. *Asian J Androl*. 2012 May;14(3):499-504.
19. Wang D, Li Y, Hou G, et al. Pygeum africanum: effect on oxidative stress in early diabetes-induced bladder. *Int Urol Nephrol*. 2010 Jun;42(2):401-8.
20. Breza J, Dzurny O, Borowka A, et al. Efficacy and acceptability of tadenan (Pygeum africanum extract) in the treatment of benign prostatic hyperplasia (BPH): a multicentre trial in central Europe. *Curr Med Res Opin*. 1998;14(3):127-39.
21. Mozos I, Stoian D, Caraba A, et al. Lycopene and Vascular Health. *Front Pharmacol*. 2018;9:521.
22. van Steenwijk HP, Bast A, de Boer A. The Role of Circulating Lycopene in Low-Grade Chronic Inflammation: A Systematic Review of the Literature. *Molecules*. 2020 Sep 23;25(19).
23. Jiang LN, Liu YB, Li BH. Lycopene exerts anti-inflammatory effect to inhibit prostate cancer progression. *Asian J Androl*. 2018 Sep 7;21(1):80-5.
24. Applegate CC, Rowles JL, 3rd, Erdman JW, Jr. Can Lycopene Impact the Androgen Axis in Prostate Cancer?: A Systematic Review of Cell Culture and Animal Studies. *Nutrients*. 2019 Mar 15;11(3).
25. Paur I, Lilleby W, Bohn SK, et al. Tomato-based randomized controlled trial in prostate cancer patients: Effect on PSA. *Clin Nutr*. 2017 Jun;36(3):672-9.
26. Pizzorno L. Nothing Boring About Boron. *Integr Med (Encinitas)*. 2015 Aug;14(4):35-48.
27. Gallardo-Williams MT, Chapin RE, King PE, et al. Boron supplementation inhibits the growth and local expression of IGF-1 in human prostate adenocarcinoma (LNCaP) tumors in nude mice. *Toxicol Pathol*. 2004 Jan-Feb;32(1):73-8.
28. Cui Y, Winton MI, Zhang ZF, et al. Dietary boron intake and prostate cancer risk. *Oncol Rep*. 2004 Apr;11(4):887-92.
29. Sletten TL, Magee M, Murray JM, et al. Efficacy of melatonin with behavioural sleep-wake scheduling for delayed sleep-wake phase disorder: A double-blind, randomised clinical trial. *PLoS Med*. 2018 Jun;15(6):e1002587.
30. Available at: <https://my.clevelandclinic.org/health/diseases/14510-nocturia>. Accessed 01/09/2024,
31. Zuo J, Jiang Z. Melatonin attenuates hypertension and oxidative stress in a rat model of L-NAME-induced gestational hypertension. *Vasc Med*. 2020 Aug;25(4):295-301.
32. Ahsanova E, Popov V, Bulanova N, Morozova T. Hypotensive Action of Melatonin in Patients with Arterial Hypertension. *Eur Cardiol*. 2020 Feb;15:e43.
33. Tordjman S, Chokron S, Delorme R, et al. Melatonin: Pharmacology, Functions and Therapeutic Benefits. *Curr Neuropharmacol*. 2017 Apr;15(3):434-43.
34. Drake MJ, Mills IW, Noble JG. Melatonin pharmacotherapy for nocturia in men with benign prostatic enlargement. *J Urol*. 2004 Mar;171(3):1199-202.
35. Sugaya K, Nishijima S, Miyazato M, et al. Effects of melatonin and rilmafazone on nocturia in the elderly. *J Int Med Res*. 2007 Sep-Oct;35(5):685-91.



# Love the **YOU** in the Mirror

**AMPK** is an *enzyme* in the body that signals cells to burn **fat** for energy.

Over time, AMPK levels decline and can cause accumulation of **abdominal fat**.

**AMPK Metabolic Activator** provides gynostemma and hesperidin extracts to:

- Revitalize youthful AMPK activity
- Encourage use of abdominal fat for energy
- Promote healthy cellular metabolism

"I noticed a difference."

**Suzy**

VERIFIED CUSTOMER  
REVIEW



Item #02207 • 30 vegetarian tablets

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For full product description and to order

**AMPK Metabolic Activator**, 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 are not guaranteed, and results may vary.

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

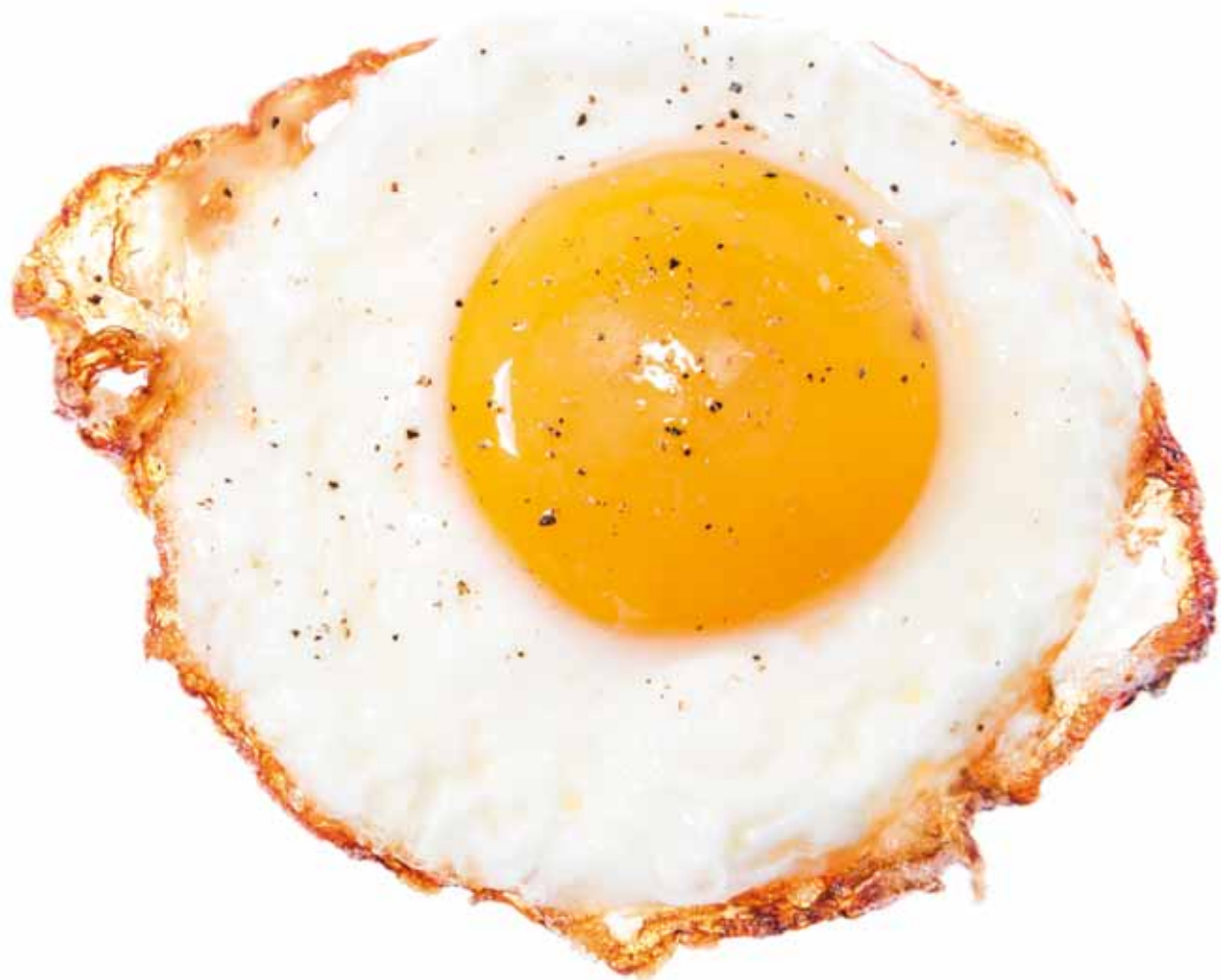
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# Feeling Fried?

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

NAD<sup>+</sup> facilitates the production of ATP, which your body uses for fuel.

**NAD<sup>+</sup> Cell Regenerator™** formulas help maintain *healthy* levels of NAD<sup>+</sup>.

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

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300 mg of nicotinamide riboside per capsule.

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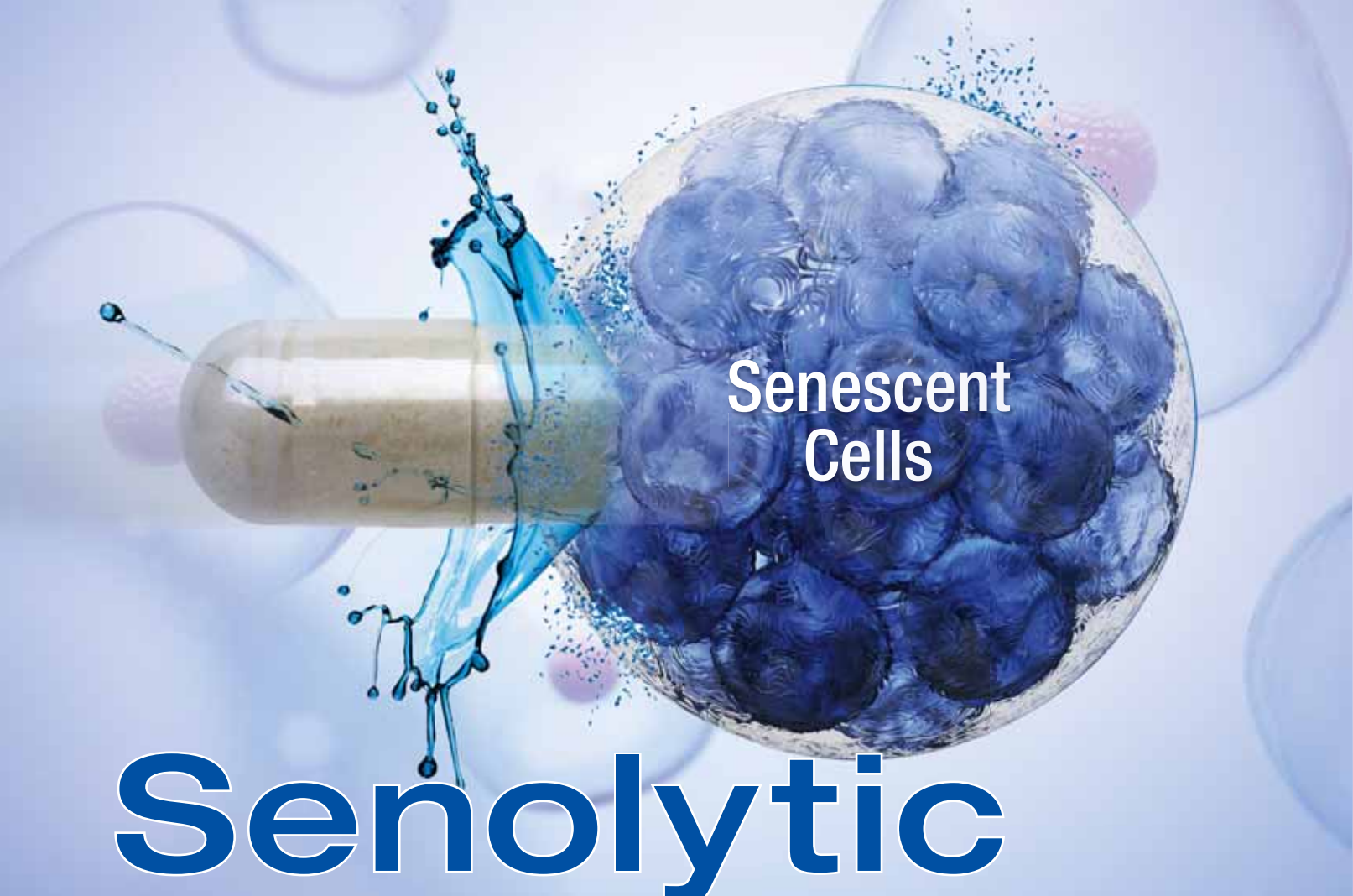
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NAD<sup>+</sup> Cell Regenerator™ has met ConsumerLab.com standards for ingredient and product quality for Nicotinamide Riboside in independent testing. More information at [www.consumerlab.com](http://www.consumerlab.com).



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Senescent  
Cells

# Senolytic

ACTIVATOR® with **BIO-FISETIN™**



"Taking this supplement, I feel I will be healthy for the long haul."

Larry

VERIFIED  
CUSTOMER  
REVIEW

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(Each bottle lasts 3 months)

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With age, our body accumulates **senescent cells** that affect the day-to-day function of the healthy cells around them.

**Senolytics** are compounds that selectively remove senescent cells.

**Senolytic Activator®** contains nutrients designed to target senescent cells for normal elimination.

This formula contains a patented **fisetin** that is more **bioavailable** than regular fisetin.

## COMPREHENSIVE SENOLYTIC SUPPORT

The **Senolytic Activator®** formula provides the following nutrients:

- **THEAFLAVINS** (polyphenols from black tea)
- **BIO-QUERCETIN** (ultra-absorbable form)
- **APIGENIN** (a natural flavonoid)
- **BIO-FISETIN™** (up to **25 times** greater bioavailability)

The suggested dose of the **Senolytic Activator®** is **3 capsules** once a week. Each bottle lasts 3 months and costs very little.

# Give the Old You a **Helping Hand**

"Helps your body do what it  
needs to do."

**Richard**

VERIFIED CUSTOMER REVIEW

Experience should build  
us up, not tear us down.

Life is a journey with bumps in the road. We move on wiser, prouder—but the marks remain. Marine oil contains compounds called specialized pro-resolving mediators. These "SPMs" support tissue rejuvenation, clear debris so healthy cells can flourish, and help maintain the balance between cytokine compounds that keep your body in harmony. Pro-Resolving Mediators. Feel like you again.

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1 bottle **\$21** • 4 bottles \$19 each



For full product description and to order **Pro-Resolving Mediators**,  
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"Works for me!"

**Michael**

VERIFIED CUSTOMER  
REVIEW

Take Your  
*sexual*  
Performance  
to the *max*



**Prelox® Enhanced Sex** promotes  
blood flow where you need it most.

For full product description and to order  
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or visit **www.LifeExtension.com**

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"Very good stuff."

**Cecil**

VERIFIED CUSTOMER  
REVIEW

# UNINTERRUPTED Dreamzzz

When nature calls... You answer. Even in the middle of an amazing dream. **Men's Bladder Support** can help inhibit your urge to urinate while asleep.

It's packed with nutrients to support your prostate and bladder, and melatonin encourages healthy sleep patterns.

In one study, healthy older men took Men's Bladder Support Formula every night before bed and an incredible **60% reported relief**.\* You can too!

Enjoy your dreams without interruptions. Try Men's Bladder Support today.



**Item #02306 • 30 vegetarian capsules**

1 bottle \$20 | 4 bottles \$18 each



For full product description and to order **Men's Bladder Support**, call **1-800-544-4440** or visit **www.LifeExtension.com**

\* Submitted by BMC Complementary and Alternative Medicine 2019.

**CAUTION:** Do not consume alcohol, drive or operate machinery after taking this product.  
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# GO WITH THE FLOW



**Ultra Prostate Formula** is designed to address essential factors involved in prostate health: size & function, hormone metabolism and yes, even nighttime flow.

It is our most advanced prostate-health supplement.

Item #02029

60 softgels

1 bottle **\$29.25**

4 bottles \$27 each



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

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JOSE CORDEIRO, PhD

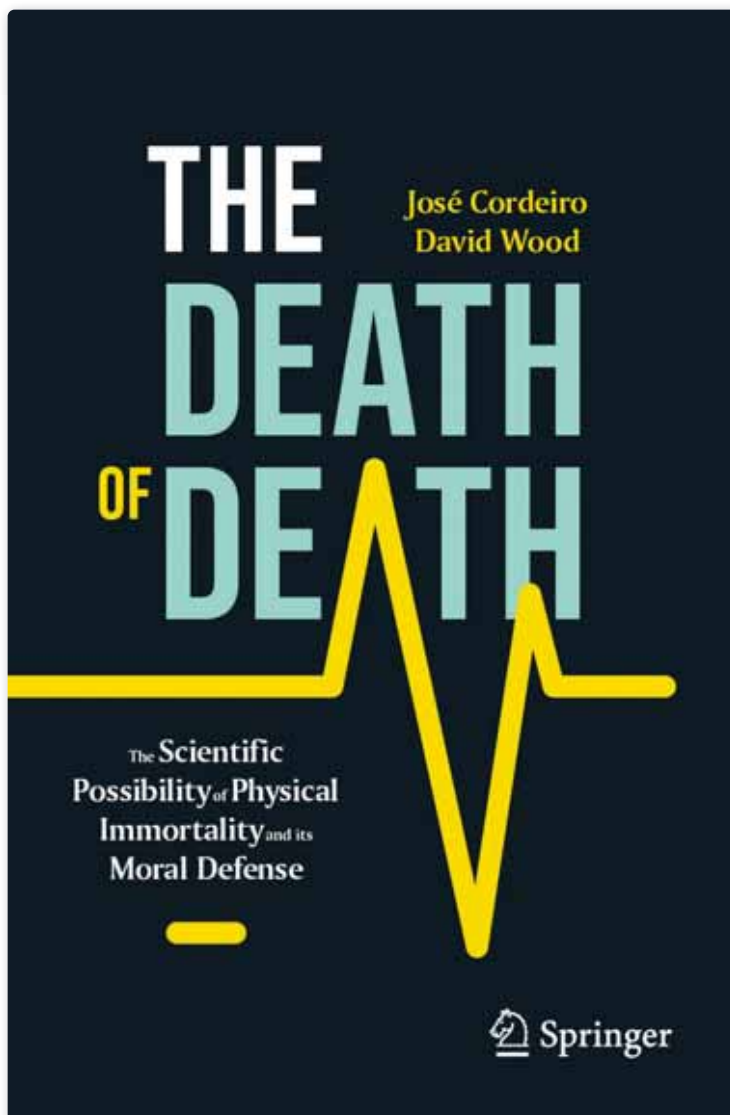


DAVID WOOD

# *The Death of Death*

## *The Scientific Possibility of Physical Immortality and its Moral Defense*

BY JOSE CORDEIRO, PhD, AND DAVID WOOD



In the book, *The Death of Death*, authors Jose Luis Cordeiro, PhD, and David Wood outline the scientific possibility of immortality.

Exponential advances in artificial intelligence, the analysis of massive sets of data (“Big Data”), tissue regeneration, and genetic therapies provide the framework for reversing and preventing aging of the human body.

Until now, medicine has focused on attacking the *symptoms* rather than the *causes* of aging. The authors argue that to avoid the processes of aging, we need to focus on preventive medicine—as opposed to curative.

The ultimate goal is to increase both the quantity and the quality of life—to be indefinitely young, not indefinitely old.

*The Death of Death* offers an intriguing look into the advances in research that have led us to this point—as well as the scientific possibility of a future that overcomes mankind’s greatest common enemy: *death*.

—LAURIE MATHENA

**LE:** What scientific progress has been made in the fight against aging?

**Cordeiro and Wood:** Scientists in different parts of the world are already investigating how aging works and how to reverse it.

For example, a group of scientists under the direction of Spanish biologist Maria Blasco, director of CNIO (the Spanish National Cancer Research Center) in Madrid, has created the so-called Triple mice, which live approximately **40%** longer.

With totally different technologies, other scientists have also been able to rejuvenate mice by **40%**.

Scientists have experimented with different types of treatments and therapies, among which we can mention, for now, caloric restriction, telomerase injections, stem cell exosome treatments, gene therapies, and more discoveries that we will continue to see in the coming years.

Two well-known North American scientists are Michael Rose, who has **quadrupled** the life expectancy of fruit flies, and Robert J.S. Reis, who has increased the longevity of nematode worms *C. elegans* by up to **10 times**.

The scientists' goal is not to get longer-lived flies and worms, but to use these discoveries to apply them to **humans** in due course.



**LE:** What other discoveries have made extended lifespans seem possible in the near future?

**Cordeiro and Wood:** We see plenty of reasons why the present time is ripe for the idea that we can, and should, abolish aging. That idea can be backed up by a host of observations:

- Examples of animals that experience negligible senescence like the bowhead whale
- Genetic manipulations that can significantly extend lifespan (and healthspan)
- Fascinating possibilities from stem cell therapies
- The game-changing possibilities of CRISPR\* genetic editing
- The increasing viability of nano-interventions, such as nano-surgery and nano-bots
- Early indications that synthetic organs can be created
- Research projects targeting each of seven identified underlying causes of aging
- Encouraging progress in new ideas for treating cancer, as well as other diseases of aging
- Promising results from big data analysis by increasingly powerful artificial intelligence
- Financial models that show the tremendous economic benefits of the longevity dividend
- Examples from other technological fields of unexpectedly rapid progress
- Examples from other activist projects of rapid changes in social mindset

These observations provide the environment in which the idea of the abolition of aging can thrive.

**LE:** What have been identified as the primary causes of aging?

**Cordeiro and Wood:** Despite the great advances of the twentieth century, there is still no universally accepted theory of aging. In fact, a large number of theories are currently competing, which can be divided in many ways.

For example, in a course at the University of California, Berkeley, four major groups were considered: molecular, cellular, systemic, and evolutionary theories, each group in turn, with three or more theories within the group.

Faced with this flood of theories, [biomedical gerontologist] Aubrey de Grey began working systemically from the end of the twentieth century to compile all the information in an inclusive system on aging.

His approach to life extension is called SENS (Strategies for Engineered Negligible Senescence). The key meaning of the term SENS is the engineering of medical therapies to reverse biological aging in humans so that we can continue to accumulate years of age while remaining biologically young.

To that end, de Grey did a thorough study of the available research on aging and realized that there are seven main types of damage related to the aging process.

These seven causes of senescence are intracellular waste, intercellular waste, nucleus mutations, mitochondrial mutations, stem cell loss, increase in senescent cells, and increase of intercellular protein links.

\* [a gene-editing technology that can be used to modify or correct precise regions of our DNA to treat serious diseases]



**LE:** How is longevity research being funded?

**Cordeiro and Wood:** Thanks to the important scientific advances in recent years, there are large and small companies that bet billions of dollars on scientific rejuvenation in humans. People are beginning to understand that this is a real possibility and closer and closer in time.

The question today is not whether it will be possible, but rather when it will be possible.

Therefore, billionaires like Peter Thiel, famous since PayPal, Jeff Bezos from Amazon, Sergey Brin and Larry Page from Alphabet/Google, Mark Zuckerberg from Facebook, Larry Ellison from Oracle, along with many others are investing in anti-aging biotechnology to reverse it.

Google created Calico (California Life Company), in 2013 to “solve death.” Mark Zuckerberg and his wife Priscilla Chan said they would donate virtually all their wealth to cure and to prevent all diseases in one generation.

Jeff Bezos started Altos Labs with other billionaires in 2021 to advance cell reprogramming technologies to allow rejuvenation treatments.

In 2022, Saudia Arabia announced the creation of Hevolution (Health + Evolution) Foundation to finance at least \$1 billion of research about longevity per year over the next two decades.

And for those who don’t know, Bill Faloos uses proceeds from **Life Extension®** supplement sales to fund highly efficient laboratory and clinical research on a variety of potential **age-reversal** interventions, including optimal ways of delivering Yamanaka transcription factors in mice, primates, and relatively soon, humans.

In 2022, three independent mouse studies demonstrated significant age reversal in response to delivery and controlled expression of Yamanaka factors in old mice.

**LE:** Will many people living today be able to take advantage of these future technologies?

**Cordeiro and Wood:** In 2004, American engineer Ray Kurzweil (co-founder of Singularity University and director of engineering at Google) and his doctor Terry Grossman, a longevity expert, wrote *Fantastic Voyage: Live Long Enough to Live Forever*.

To summarize, the book begins with the description of three “bridges” to the indefinite life. We can simplify and update the information by describing the three bridges as follows, according to our own interpretation:

1. The First Bridge consists of doing what your mother or grandmother would tell you (eating well, sleeping well, exercising, not smoking) with added medical knowledge.
2. The Second Bridge will grow strongly during the 2020s with the biotechnology revolution. As we continue to study the genetic code of our biology, we will discover ways to escape disease and aging so that we can fully develop our human potential.
3. The Third Bridge will correspond mainly to the 2030s and will become a reality thanks to the revolution in nanotechnology and artificial intelligence. The convergence of these technological revolutions will allow us to reconstruct bodies and minds at the molecular level. By 2045, at the latest, we will reach technological singularity and immortality, both biological and computational.

The subtitle of Kurzweil and Grossman’s *Fantastic Voyage* is very suggestive: *Live Long Enough to Live Forever*. Implicit in this phrase is the idea that if we manage to live long enough in the next few years, until we cross the three bridges and reach rejuvenation, then we could live indefinitely (as long as we want to and that we don’t perish due to an accident).

**LE:** Do they suggest ways to do that?

**Cordeiro and Wood:** In *Fantastic Voyage*, the authors promote life-style changes such as a low glyce-mic index diet, calorie restriction, exercise, drinking green tea and alkaline water, using certain supple-ments, and other changes in daily routines.

In the continuation of that book, *Transcend*, Kurzweil and Grossman propose a more complete program in nine steps corresponding to each letter of the word TRANSCEND:

**T** - Talk with your doctor

**R** - Relaxation

**A** - Assessment

**N** - Nutrition

**S** - Supplements

**C** - Calorie Restriction

**E** - Exercise

**N** - New Technologies

**D** - Detoxification

**LE:** You've discussed that extend-ing human life is possible in com-ing years. But another question that often arises is whether or not it is *ethical*.

**Cordeiro and Wood:** It is not only ethical, but also our moral responsi-bility. The greatest cause of suffering in the world is aging and the age-related diseases that lead to death. Today, about 150,000 people in the world die every day. Two-thirds of those deaths are due to age-related diseases.

Aging is a tragedy difficult to compare with any other. The great enemy of humanity is death caused by aging.

**LE:** What is next?

**Cordeiro and Wood:** We already have reliable evidence that both the control of aging and rejuvenation are possible. Proofs of concept already exist in cells, in tissues, in organs and in model organisms such as yeasts, worms, flies, and mice.

We are witnessing the conver-gence of scientists, investors, large corporations and small startups working directly on issues of human aging and rejuvenation. We have sci-ence, we have money, and we have the ethical responsibility to end the major cause of human suffering.

Despite all the future problems, many of them still unforeseen and even unpredictable, today we can finally see that there is a light at the end of the tunnel. •

**For those interested in learning about an upcoming longevity conference where Jose Cordeiro will be speaking, turn to the next page.**

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

*The Death of Death* book has become a strong seller worldwide. It was originally published in Spanish by Deusto in 2018, and is now available in English.

Excerpted from *The Death of Death* by Jose Luis Cordeiro and David Wood. Copyright © 2023. Reprinted with permission by Springer.

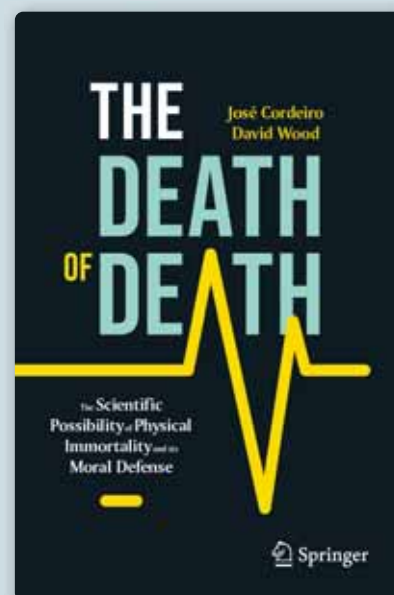
### ABOUT THE AUTHORS

**Jose Luis Cordeiro**, PhD, is an engineer, economist, and futurist. He is the founder and president of the World Future Society Venezuela, president of the Venezuela Node of the Millennium Project, and founder and executive director of the Ibero-Amer-ican Futurists Network. Cordeiro has published more than 10 books.

**David Wood** is a full-time futurist speaker, analyst, commentator, and writer. He founded the UK-based Transpolitica and was a founding member of the Transhumanist Party UK. Wood is the Principal at Delta Wisdom, an independent futurist consultancy and publisher.

To order *The Death of Death*, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item #34201 | Price \$25.19



FOR THOSE INTERESTED IN SUPER LONGEVITY:

# RAADfest 2024 Biomedical Conference

September 5-8, 2024, in Anaheim, California

BY WILLIAM FALOON



## New Format: More Direct Interactions with the Experts

The 9<sup>th</sup> annual ***Revolution Against Aging and Death*** (RAADfest) conference will be a new experience with LOTS more interactive time with the **longevity experts**.

Previous RAADfests have cumulatively featured hundreds of credentialed scientists and physicians on the cutting edge of **aging research** and clinical applications.

The first ever study to demonstrate human **age-reversal** was announced at **RAADfest** and subsequently made headlines around the world.

This year's RAADfest will feature announcements about research initiatives and findings from ongoing clinical studies.

Attendees will have access to physician-scientists to discuss options of utilizing knowledge garnered from those engaged in regenerative medicine protocols and/or participating in clinical studies.

## The Ultimate Networking Event

The prime purpose of RAADfest is to bring together scientists, frontline physicians and longevity enthusiasts to share knowledge to accelerate our goal of defeating **biological aging**.

The connections made at previous RAADfests have enabled unprecedented research projects to launch, including a brand new fully equipped laboratory dedicated to eradicating the scourge of premature aging and death.

At RAADfest, scientists have interacted and exchanged critical information with each other in ways that enable clinical studies to rapidly initiate and recruit participants who want immediate access to potential lifesaving interventions.



### Improved Interactive Format

The good news is there are multitudes of exciting developments in the anti-aging medicine fields. But trying to include ALL the researchers at one RAADFest can make it hard for attendees to focus on what may be most important to their healthy longevity.

The plan for **RAADFest 2024** (Sept. 5-8) is to select the most relevant current scientists/physicians who will succinctly present their findings, and later open the sessions up to the entire audience for discussions and questions many people will have.

The goal is for each attendee to be an active participant, with more time for direct interactions and more breakout times for robust discussions, suggestions, and intellectual sharing.

### The Speakers

We are selecting the most relevant speakers as it relates to where they are in making scientific discoveries that will advance practical methods to enable us to live *longer*.

The strategy is to enable attendees to improve underlying health issues and remain alive to enjoy the upcoming **biomedical renaissance**.

The surge in **age-reversal** research will be apparent with presentations by scientists who are advancing regenerative interventions for rapid clinical transition.

### The Schedule and Discounted Registration

**RAADFest 2024** begins the evening of Thursday, Sept. 5, 2024, with formal presentations and interactive sessions continuing Friday and Saturday (Sept. 6 and 7) and closing sessions early Sunday (Sept. 8).

RAADFest is produced by the nonprofit **Coalition for Radical Life Extension** that relies on **charitable donations** to make this event affordable, including complimentary healthy meals to keep the group interacting together.

The donations enable you to register at the remarkable low rate of **\$598** until April 30, 2024. (Use code "LEF" to obtain this discounted price.)

To put this registration rate in perspective, people today pay **thousands** of dollars for tickets to concerts that last only a few hours. And this does not include direct interactions with the star performers or **free** healthy meals/beverages.

RAADFest provides days of unique presentations and interactions with the scientific stars dedicated to saving **humanity** from the ravages of degenerative aging.

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To register and make hotel reservations if needed, visit [www.raadfest.com](http://www.raadfest.com) or call: 480-345-6554.

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SCAN ME



*RAADfest is produced by the not-for-profit Coalition for Radical Life Extension*



# CURCUMIN'S Multiple Diabetes Benefits





BY SARAH A. LOBISCO, ND, IFMCP

An estimated **537 million** adults worldwide have **type II** diabetes, and the numbers are rising.<sup>1</sup>

The **high blood sugar** that defines diabetes can lead to a host of dangerous conditions including heart disease, vision loss, kidney failure, and other major health problems.<sup>2</sup> All of which significantly contribute to *accelerated aging*.<sup>3</sup>

**Curcumin**, derived from the turmeric root, has been **clinically** shown to help reduce multiple risk factors for **type II diabetes** and to lower elevated blood sugar in those with diabetes or prediabetes.<sup>4-6</sup>

Managing type II diabetes can be challenging for both patient and doctor. While physicians usually recommend diet, exercise, and medications for treating patients with type II diabetes, research is showing that **curcumin** can provide additional support.<sup>6</sup>

## Insulin Resistance and Diabetes

When we take in food, our blood sugar rises. That signals the pancreas to release a hormone called **insulin**, which helps cells use that glucose for energy. As a result, blood sugar falls again.

**Type II diabetes** results from **insulin resistance** when cells don't respond properly to the hormone. Blood sugar levels stay elevated, which is known as **hyperglycemia**.<sup>7</sup>

Hyperglycemia can lead to systemic complications including diseases of the heart, blood vessels, kidneys, eyes, and nervous system, and an increased risk for cancer.<sup>2</sup>

## How Diabetes Harms the Body

**Inflammation** likely contributes to the development of **insulin resistance**, and worsens hyperglycemia, in diabetes.<sup>8,9</sup>

That high blood sugar triggers *more* inflammation, which drives accelerated aging<sup>10</sup> and risk for chronic illness, including heart disease and cancer.<sup>9,11,12</sup>

Excess glucose also leads to **oxidative stress**, which can severely damage cells and tissues.<sup>8,13</sup> Among other problems, oxidative stress results in:<sup>14</sup>

- Decreased glucose transport and insulin secretion,
- Protein and DNA damage,
- Increased **vascular permeability**.

## How Curcumin Helps

For thousands of years, **turmeric root** has been used as a traditional Asian medicine.

The most studied compounds in turmeric are **curcuminoids**, which include **curcumin** and related compounds.<sup>15-17</sup>

Scientists have discovered that curcumin has multiple molecular targets that make it ideal for modulating certain molecular pathways to help reduce the risk of elevated blood sugar.<sup>18,19</sup>

Specifically, curcumin has many health-promoting properties, including **antioxidant**, **anti-inflammatory** and **blood sugar lowering** effects.<sup>18,19</sup>

Curcumin can help protect against the development of diabetes and the harm diabetes can do in multiple ways, including:<sup>18</sup>

- Activating **PPAR-gamma**, a metabolic regulator that increases insulin sensitivity and *lowers* insulin resistance,<sup>18,20</sup>
- **Anti-inflammatory** actions, including inhibiting signaling molecules that increase inflammation,<sup>18</sup>
- Improving the function and health of cells that **make insulin**,<sup>18,21</sup>
- Reducing the formation of **advanced glycation end products** and protecting against the damage they can do,<sup>22,23</sup>
- **Antioxidant** activity, which reduces oxidative stress, and
- Improving **lipid** levels, reducing some markers of metabolic dysfunction and heart disease.

In animal models, curcumin extract shows promise in helping to prevent diabetes development and decreases insulin resistance.<sup>15,18,19,24</sup>





## WHAT YOU NEED TO KNOW

### Help Prevent and Control Diabetes

- High blood sugar and **type II diabetes** cause damage throughout the body.
- **Curcumin**, derived from the turmeric root, can reduce multiple risk factors for developing diabetes, including oxidative stress and inflammation.
- Curcumin also reduces insulin resistance and lowers **high blood sugar**, helping to prevent the worst damage diabetes can do.

### Human Trials

**Clinical trials** and meta-analyses have shown that curcumin intake can benefit those with **type II diabetes** or **prediabetes**, and even those who are completely healthy.<sup>6,21,25-27</sup>

In a randomized controlled trial of overweight people with **type II diabetes**, taking **1,500 mg** of **curcumin** for **10 weeks** resulted in significantly *lower* fasting blood glucose of **7 mg/dl** in those taking the curcumin supplements as compared to the baseline group.

In the **placebo** arm of this study, a **3 mg/dl** *rise* was observed as compared to baseline. Additionally, there was a decline in body weight by **1.4 lbs.** in average body weight in the group that received curcumin as compared to the baseline.<sup>25</sup>

Another trial of patients with **type II diabetes** found that taking **1,500 mg** of curcumin for **10 weeks** decreased **triglycerides** and **inflammatory** markers. Interestingly, it also increased levels of **adiponectin**, a hormone that *enhances* insulin sensitivity.<sup>26</sup> Low levels of adiponectin are associated with type II diabetes and obesity.<sup>28</sup>

### Wide-Ranging Antidiabetic Benefits

Many reviews and analyses of **clinical trials** have also concluded that **curcumin** can be a beneficial support to help manage diabetes and metabolic health.

In a review of seven clinical studies of people with type II diabetes, taking curcumin at doses ranging from **80 mg** to **1,500 mg** led to improvements across a range of health markers related to type II diabetes:<sup>6</sup>

- Improvement in lipid levels, including reductions in total cholesterol, LDL cholesterol, a lipid that increases risk of heart disease, and
- Reduction in HbA1c levels (frequently used to diagnose prediabetes and diabetes) on average **0.42%** in treatment groups as compared to baseline.

Additional reviews of trials in people with **type II diabetes** and **prediabetes** found that taking curcumin led to improvements in insulin and blood sugar levels, increased levels of adiponectin, the hormone that improves insulin sensitivity, liver enzymes, lipid levels, and more.<sup>5,29</sup>

Taken together, these studies and reviews show that **curcumin** may lower the chances of developing type II diabetes to begin with and can reduce some of its consequences in those who already suffer from diabetes.

### A Better Curcumin

Taken orally, traditional curcumin is difficult to absorb.<sup>30-32</sup>

Scientists found a way around this problem by combining **curcumin** with **galactomannan**, a form of fiber derived from the spice **fenugreek**. This prevents modification of curcumin in the gut and increases its **bioavailability**.

This form of curcumin has been shown to increase bioactive free curcumin in human and laboratory studies.<sup>30-32</sup> In one clinical trial, this unique extract increased curcumin levels in the blood more than **45 times higher** than unformulated curcumin.<sup>31</sup>

### Summary

**Type II diabetes** is an escalating epidemic. **Curcumin** has shown an ability to help prevent its development.

It also lowers damaging **high blood sugar** and prevents some of its unhealthy effects in those who already have type II diabetes or prediabetes. •

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

### References

1. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK581940/#:~:text=An%20estimated%20537%20million%20adults%20aged%2020%E2%80%9379%20years%20worldwide,to%20be%20living%20with%20diabetes>. Accessed January 11, 2023.
2. Available at: <https://www.cdc.gov/diabetes/managing/problems.html#:~:text=Common%20diabetes%20health%20complications%20include,how%20to%20improve%20overall%20health>. Accessed January 11, 2024.
3. Bahour N, Cortez B, Pan H, et al. Diabetes mellitus correlates with increased biological age as indicated by clinical biomarkers. *Geroscience*. 2022 Feb;44(1):415-27.





4. Jie Z, Chao M, Jun A, et al. Effect of Curcumin on Diabetic Kidney Disease: A Systematic Review and Meta-Analysis of Randomized, Double-Blind, Placebo-Controlled Clinical Trials. *Evid Based Complement Alternat Med*. 2021;2021:6109406.
5. Rivera-Mancía S, Trujillo J, Chaverri JP. Utility of curcumin for the treatment of diabetes mellitus: Evidence from preclinical and clinical studies. *Journal of Nutrition & Intermediary Metabolism*. 2018 2018/12/01;14:29-41.
6. Altobelli E, Angeletti PM, Marziliano C, et al. Potential Therapeutic Effects of Curcumin on Glycemic and Lipid Profile in Uncomplicated Type 2 Diabetes-A Meta-Analysis of Randomized Controlled Trial. *Nutrients*. 2021 Jan 27;13(2).
7. Available at: <https://www.niddk.nih.gov/health-information/diabetes/overview/what-is-diabetes>. Accessed January 11, 2024.
8. Rehman K, Akash MSH. Mechanisms of inflammatory responses and development of insulin resistance: how are they interlinked? *Journal of Biomedical Science*. 2016 2016/12/03;23(1):87.
9. Wu H, Ballantyne CM. Metabolic Inflammation and Insulin Resistance in Obesity. *Circulation Research*. 2020;126(11):1549-64.
10. Park MH, Kim DH, Lee EK, et al. Age-related inflammation and insulin resistance: a review of their intricate interdependency. *Arch Pharm Res*. 2014 Dec;37(12):1507-14.
11. Ma X, Nan F, Liang H, et al. Excessive intake of sugar: An accomplice of inflammation. *Front Immunol*. 2022;13:988481.
12. Shen CY, Lu CH, Wu CH, et al. The Development of Maillard Reaction, and Advanced Glycation End Product (AGE)-Receptor for AGE (RAGE) Signaling Inhibitors as Novel Therapeutic Strategies for Patients with AGE-Related Diseases. *Molecules*. 2020 Nov 27;25(23).
13. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK576381/>. Accessed 11/12/2023,
14. Bhatti JS, Sehrawat A, Mishra J, et al. Oxidative stress in the pathophysiology of type 2 diabetes and related complications: Current therapeutics strategies and future perspectives. *Free Radical Biology and Medicine*. 2022 2022/05/01;184:114-34.
15. Parsamanesh N, Moossavi M, Bahrami A, et al. Therapeutic potential of curcumin in diabetic complications. *Pharmacol Res*. 2018 Oct;136:181-93.
16. de Melo ISV, Dos Santos AF, Bueno NB. Curcumin or combined curcuminoids are effective in lowering the fasting blood glucose concentrations of individuals with dysglycemia: Systematic review and meta-analysis of randomized controlled trials. *Pharmacol Res*. 2018 Feb;128:137-44.
17. Sharifi-Rad J, Rayess YE, Rizk AA, et al. Turmeric and Its Major Compound Curcumin on Health: Bioactive Effects and Safety Profiles for Food, Pharmaceutical, Biotechnological and Medicinal Applications. *Front Pharmacol*. 2020;11:01021.
18. Pivari F, Mingione A, Brasacchio C, Soldati L. Curcumin and Type 2 Diabetes Mellitus: Prevention and Treatment. *Nutrients*. 2019 Aug 8;11(8).
19. Zhang DW, Fu M, Gao SH, Liu JL. Curcumin and diabetes: a systematic review. *Evid Based Complement Alternat Med*. 2013;2013:636053.
20. Li H-Y, Yang M, Li Z, Meng Z. Curcumin inhibits angiotensin II-induced inflammation and proliferation of rat vascular smooth muscle cells by elevating PPAR- $\alpha$  activity and reducing oxidative stress. *Int J Mol Med*. 2017 2017/05/01;39(5):1307-16.
21. Chuengsamarn S, Rattanamongkolgul S, Luechapudiporn R, et al. Curcumin extract for prevention of type 2 diabetes. *Diabetes Care*. 2012 Nov;35(11):2121-7.
22. Alizadeh M, Kheirouri S. Curcumin against advanced glycation end products (AGEs) and AGEs-induced detrimental agents. *Crit Rev Food Sci Nutr*. 2019;59(7):1169-77.
23. Prasad K, Tiwari S. Therapeutic Interventions for Advanced Glycation-End Products and its Receptor-Mediated Cardiovascular Disease. *Curr Pharm Des*. 2017 Oct 06;23(6):937-43.
24. Lu W, Khatibi Shahidi F, Khorsandi K, et al. An update on molecular mechanisms of curcumin effect on diabetes. *J Food Biochem*. 2022 Oct;46(10):e14358.
25. Hodaie H, Adibian M, Nikpayam O, et al. The effect of curcumin supplementation on anthropometric indices, insulin resistance and oxidative stress in patients with type 2 diabetes: a randomized, double-blind clinical trial. *Diabetol Metab Syndr*. 2019;11:41.
26. Adibian M, Hodaie H, Nikpayam O, et al. The effects of curcumin supplementation on high-sensitivity C-reactive protein, serum adiponectin, and lipid profile in patients with type 2 diabetes: A randomized, double-blind, placebo-controlled trial. *Phytother Res*. 2019 May;33(5):1374-83.
27. Dehzad MJ, Ghalandari H, Nouri M, Askarpour M. Effects of curcumin/turmeric supplementation on glycemic indices in adults: A grade-assessed systematic review and dose-response meta-analysis of randomized controlled trials. *Diabetes Metab Syndr*. 2023 Oct;17(10):102855.
28. Achari AE, Jain SK. Adiponectin, a Therapeutic Target for Obesity, Diabetes, and Endothelial Dysfunction. *Int J Mol Sci*. 2017 Jun 21;18(6).
29. Zhang T, He Q, Liu Y, et al. Efficacy and Safety of Curcumin Supplement on Improvement of Insulin Resistance in People with Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Evid Based Complement Alternat Med*. 2021 2021/08/25;2021:4471944.
30. Matthewman C, Krishnakumar IM, Swick AG. Review: bioavailability and efficacy of 'free' curcuminoids from curcumagalactomannoside (CGM) curcumin formulation. *Nutr Res Rev*. 2023 Jan 19:1-18.
31. Kumar D, Jacob D, Subash PS, et al. Enhanced bioavailability and relative distribution of free (unconjugated) curcuminoids following the oral administration of a food-grade formulation with fenugreek dietary fibre: A randomised double-blind crossover study. *J Funct Foods*. 2016;22:578-87.
32. Krishnakumar IM, Maliakel A, Gopakumar G, Kumar D. Improved blood-brain-barrier permeability and tissue distribution following the oral administration of a food-grade formulation of curcumin with fenugreek fibre. *Journal of Functional Foods*. 2015;14(215-225).

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# Singapore Opens First Public “Healthy Longevity Clinic”

BY LAURIE MATHENA



Most longevity clinics are private and accessible only to the elite few who can afford them. A new venture hopes to change all that.

The National University Health System, National University of Singapore, and Alexandra Hospital in Singapore recently announced the opening of the world's first **Healthy Longevity Clinic** located within a **public hospital**.

The Healthy Longevity Clinic aims to incorporate advances in **geroscience** and precision **longevity** medicine into **clinical practice** at an affordable cost.

With the opening of this clinic, the goal is to increase the **healthspan** of Singaporeans by **three years** over the next decade. **Healthspan** refers to the number of years a person lives in good health.

Singapore already ranks **number seven** on the list of the world's **longest-living populations**. This shift toward *preventive* healthcare for the broader population is likely to **boost** their ranking.

## Comprehensive Care Plan

The **Healthy Longevity Clinic** provides a comprehensive program that starts with baseline assessments and a personal care plan based on the results, then follows up with frequent health coaching and monitoring of progress.

The **baseline assessment** identifies a patient's biological age as well as risk factors for chronic disease.

While **chronological age** refers to how long a person has been alive, **biological age** measures the *rate* at which an individual is aging.<sup>1</sup>

This is calculated through assessments including aging biomarkers, exercise capacity, and epigenetics. In addition, bloodwork determines the health of metabolic, immune, liver, kidney, and other organ functions.

The clinic also measures many of the health parameters **Life Extension®** has long recommended. These include arterial stiffness, microbiome analysis, body composition analysis, and digital biomarkers tracking factors like sleep and physical activity.

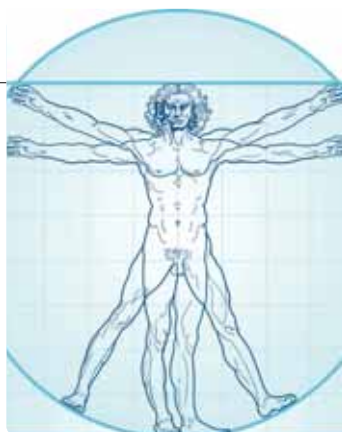
Next, a team of health professionals puts together a **personalized care plan** based on the assessment. This includes recommendations for diet and exercise changes, supplementation, and, if necessary, medications.

Individuals are then supported with regular **health coaching sessions**.

These sessions, says Cheryl Tan, a health coach with Alexandria Hospital, will “inculcate healthy habits in line with our treatment plan, which includes a combination of lifestyle interventions, such as dietary, exercise and sleep modifications, on top of medical interventions, such as medicines and supplements as recommended by the physicians.”

The **Healthy Longevity Clinic** advises **follow-up** testing to monitor progress. Key indicators that determine treatment effectiveness include:

- A *reduction* of **0.5%** in **HbA1C** (average blood glucose levels),
- A *reduction* of **30-40 mg/dL** in **LDL** cholesterol levels,
- A **33% reduction** in **HS-CRP** levels (inflammation levels, a risk factor for heart disease and stroke), and
- An *increase* of **3-5 mL/kg/min** in **VO2 max** (the maximum amount of oxygen someone can consume during peak exercise, an indicator of longevity).



The ultimate goal is to *lower* an individual's **biological age**.

### Collaborative Medicine

The Healthy Longevity Clinic is located within the National University Health System's Centre for Healthy Longevity (NUHS CHL), a research facility at Alexandria Hospital that tests new treatments and technologies for **healthy longevity**.

The clinic will partner with **NUHS CHL**, giving individuals the unique opportunity to participate in **research trials** for supplements, repurposed drugs, and other ways to target biological aging.

One clinical trial testing lifestyle interventions and nutritional supplementation is already underway.

The clinic will also partner with **Alexandria Hospital**, using its existing infrastructure for laboratory, imaging, and other specialties.

### Affordable and Accessible

“The ultimate goal,” the Healthy Longevity Clinic noted in a press release, “is to make evidence-based healthy longevity medicine accessible to everyone.”

As part of that goal, the clinic offers services at a fraction of the cost of private longevity clinics.

While private clinics can cost tens of thousands of dollars for this type of personalized plan, Singapore's new clinic charges between **\$1,500**

and **\$3,000** for a baseline assessment and *year-long* customized care program.

Dr. Laureen Wang, a practicing cardiologist with Alexandria Hospital and National University Health System, is heading up the Healthy Longevity Clinic and describes their holistic approach as follows:

“Our longevity medicine teams will draw up a longevity road map to help individuals learn how to invest in health long after visiting the clinic,” Dr. Wang says, “so he or she will be able to continue doing things at age 80 or 90, such as carrying grandchildren or walking up the stairs, which are a big boost for the quality of life.”

By following the program and incorporating important preventive measures, clients can expect to **reverse** their biological age, emerge with a younger, healthier body, and extend healthspan. •

For more information, visit <https://coe.nuhs.edu.sg/Centre-for-Healthy-Longevity> or email [AH\\_Wellness@nuhs.edu.sg](mailto:AH_Wellness@nuhs.edu.sg).

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

1. Zhang Q. An interpretable biological age. *Lancet Healthy Longev*. 2023 Dec;4(12):e662-e3.

# Quinoa

BY LAURIE MATHENA



## References

1. Chaudhary N, Walia S, Kumar R. Functional composition, physiological effect and agronomy of future food quinoa (*Chenopodium quinoa* Willd.): A review. *Journal of Food Composition and Analysis*. 2023 2023/05/01;118:105192.
2. Available at: <https://www.hsph.harvard.edu/nutritionsource/food-features/quinoa/#:~:text=Quinoa%20and%20Health&text=One%20cup%20cooked%20provides%20about,cannot%20make%20on%20their%20own>. Accessed January 22, 2024.
3. Abellan Ruiz MS, Barnuevo Espinosa MD, Garcia Santamaria C, et al. [Effect of quinoa (*Chenopodium quinoa*) consumption as a coadjuvant in nutritional intervention in prediabetic subjects]. *Nutr Hosp*. 2017 Oct 24;34(5):1163-9.
4. Pourshahidi LK, Caballero E, Osses A, et al. Modest improvement in CVD risk markers in older adults following quinoa (*Chenopodium quinoa* Willd.) consumption: a randomized-controlled crossover study with a novel food product. *Eur J Nutr*. 2020 Oct;59(7):3313-23.
5. Navarro-Perez D, Radcliffe J, Tierney A, Jois M. Quinoa Seed Lowers Serum Triglycerides in Overweight and Obese Subjects: A Dose-Response Randomized Controlled Clinical Trial. *Curr Dev Nutr*. 2017 Sep;1(9):e001321.

**Quinoa** (KEEN-wah) is an edible seed that has been called one of the world's healthiest foods.

NASA (National Aeronautics and Space Administration) even identified quinoa as an ideal food for long-term space missions because of its high protein values and unique amino acid composition.<sup>1</sup>

Just one cup of quinoa contains **8 grams** of protein and **5 grams** of fiber. It is a source of nutrients like folate, zinc, manganese, and magnesium.<sup>2</sup>

These features translate to better metabolic health and a reduced risk of cardiovascular disease (even for those who aren't traveling to space).

In a randomized, placebo-controlled, double-blind study, 30 people took a quinoa product or a placebo for 28 days.<sup>3</sup> Compared to the placebo group, the quinoa group reported increases in the degree of fullness and satiation.

They also had *decreases* in BMI and HbA1c (a measure of blood sugar).

In another study, adults consumed **15 grams** of quinoa flour biscuits per day. After 28 days, they had significant reductions in LDL cholesterol, total cholesterol, body weight, and BMI (compared to those who ate biscuits made with wheat).<sup>4</sup>

Consuming **50 grams** of quinoa per day has also been shown to lower serum triglycerides in overweight and obese people, while reducing the prevalence of metabolic syndrome.<sup>5</sup>

Quinoa is considered a "pseudo grain." This means that even though it is not a grain, it tends to be consumed in the same ways as cereal grains.<sup>5</sup>

One notable difference, however, is that quinoa is **gluten-free**. This makes it a popular option for people with celiac disease or gluten sensitivities.<sup>5</sup>

Quinoa is a versatile food that can be eaten for breakfast (try a tasty quinoa breakfast bar with rolled oats, almond butter, and cinnamon), as a lunch bowl (try quinoa and vegetables topped with feta), or it can be served as a simple side dish with dinner.

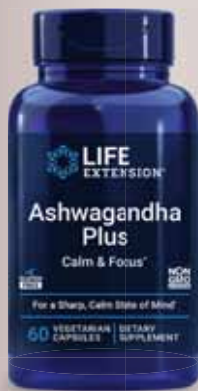
Just be sure to rinse it before cooking to get rid of saponins from the outer layer, which can have a bitter flavor.

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**References:**

1. J Amer Nutraceutical Assoc. 2008;11:1.
  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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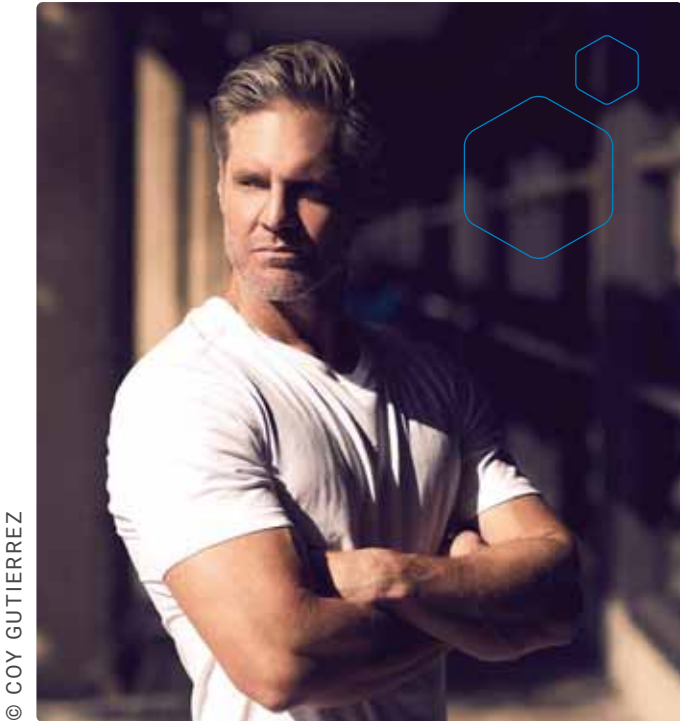
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# Patrick Murphy

## Advice From Hollywood's Top Trainer

BY LAURIE MATHENA



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Patrick Murphy has made a name for himself in Hollywood. Not as an actor or director, but as the man you call when you want to get in the best shape of your life.

Murphy has transformed the physiques of numerous Hollywood superstars.

His elite personal-trainer status is the result of 30-plus years of experience creating ultra-beneficial, *low-risk* fitness programs that yield tabloid-worthy results.

As part of this regimen, Murphy utilizes Life Extension® supplements because he believes they are a key component of helping his clients reach their optimized potential.

In addition to helping individuals get more physically fit, Murphy believes that exercise is ultimately a way to help people combat the effects of aging.

Here, Murphy shares many of his insider tips for people of any age to look and feel their best.

### Top Training Tips

Murphy's client list reads like a who's who of physically fit actors starring in some of Hollywood's biggest blockbusters. The results of his diligent training methods can be seen in numerous films.

For example, he has trained many action film stars. "All of the action training, (fight scene choreography, horseback riding, judo, jujitsu, and tumbling around like a teenager) takes a toll on the body," said Murphy. "Ultimately, the main fitness goals for these actors is stabilization, corrective exercise, muscular endurance, flexibility, and recovery."

These are the same fitness goals Murphy encourages for all his clients.

"Whatever the fitness goals might be—lean mass gains, body fat loss, rehab, getting rid of low back pain, etc.—my training guidelines BEGIN with posture and alignment," said Murphy. "Corrective exercises that influence posture and alignment ensure optimal length and tension relationships with our muscle groups. And when posture and alignment improve, clients will reduce overall pain."

These corrective exercises are essential because many common lifestyle postures (like sitting in front of a computer) cause people to have forward heads, protracted shoulders, and weak low backs. Doing appropriate positive adaptation exercises helps to combat how people carry themselves.

“My corrective approach also gives clients awareness outside of the gym,” said Murphy. “How we stand, sit, and sleep all play a part in optimal health, which creates a pain-free life.”

## Built to Move

Focusing on fitness becomes even more paramount for maintaining overall health with age.

“The human body is built to move. I often say that the lack of circulation is the root of all evil,” said Murphy. “I believe that a proper exercise program is the number one prescription for mental health, reducing stress, correcting posture and alignment, gaining strength and bone density, boosting the immune system, and building a pain-free body.”

For example, while aging leads to loss of muscle and bone density, Murphy explains that resistance training helps individuals gain lean muscle, stabilize the joints, and increase bone density.

Cardiovascular fitness, on the other hand, is important for strengthening the heart and respiratory systems, which also increases cognitive function and sleep.

“Whenever I work with actors in demanding physical roles, regardless of their age, it’s paramount to keep them moving,” said Murphy. “The more physical issues a client has, the more they need to move!”

## Fitting Supplements into Fitness

Murphy pairs exercise with nutrition plans focused on a whole-food diet and targeted supplements that are just as critical to overall wellness.

“I really like the universal supplements that impact the mind and body in a multitude of ways,” said Murphy. “Most of my regimens for clients cover all the bases for optimal health, i.e., circulation, immunity, antioxidants, anti-inflammatory, blood sugar regulation, cognitive health, and recovery.”

However, he also includes supplements specifically designed to facilitate body fat loss, add lean mass, improve gut health, elevate mood, and increase restful sleep and recovery.

**Life Extension®** supplements are a key part of that plan, which Murphy has been personally using and recommending for more than 20 years.

“After my personal experience with many Life Extension® products, I knew I had to share them with my clients,” said Murphy. “The bioavailability of the products is undeniable.”

The following supplements are Murphy’s favorites—and the reason why he utilizes them:

- **Super Ubiquinol CoQ10 with PQQ** - for cardiovascular health and circulation
- **Super Omega-3 Plus EPA/DHA Fish Oil** - for circulation, and an anti-inflammatory
- **R-Lipoic Acid** - strong antioxidant, helps cellular function/energy, helps regulate blood sugar
- **Super Bio-Curcumin® Turmeric Extract** - strong anti-inflammatory for joints and all organs
- **Vitamin C and Bio-Quercetin Phytosome** – immunity enhancer, and for cardiovascular health
- **Super Carnosine** - for muscle recovery and strong antioxidant

## Fitness Programs for Anti-Aging

For those wanting to utilize Murphy’s fitness methods at home, he has created a program based on the regimen he used to prepare actors for a hit beach-based movie.

It provides corrective training guidelines, full-body circuit workouts, and two-day workout splits for upper body and lower superset workouts.

Murphy also offers one-hour phone consultations.

To find out more, visit <https://murphyfitness.com/>

“We will all age and grow older, but we do have the ability to slow the process,” said Murphy. “When you prioritize and invest in your fitness, you’re demonstrating love for yourself as you create a higher quality of life.” •

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

## Top Exercises for Seniors

While there is no one-size-fits-all workout plan, certified personal trainer Patrick Murphy says that the majority of seniors can benefit from the following exercises:

- **Bridges** (lying on your back with your knees bent, and then lifting your pelvis into the air)
- **Bird dogs** (starting on hands and knees, and then reaching your right hand forward and your left leg back),
- **Resistance band exercises** like rows and lateral raises, and
- **Chair squats.**

He also recommends water aerobics and taking 45- to 60-minute walks daily.

No matter your age or situation, Murphy’s advice is to “Keep strengthening, and keep moving. Age is just a number!”



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#### References

1. *Front Microbiol.* 2016;7:1204.
2. *Korean J Nutr.* 2007;40(2):154-61.

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### 7 **CANCER DEATH RATES DROP...BUT NOT ENOUGH!**

Despite a **32%** reduction in cancer **deaths** since 1991, cancer claimed **16 million** lives during this period. **Combination** treatments, **screenings**, repurposed **medications**, and healthy **dietary changes** could save many lives.



### 24 **PROTECT AGAINST VISION LOSS**

Smart phones, high blood sugar, and UV light damage can lead to vision loss. Clinical studies reveal simple measures to better preserve ocular health.



### 34 **EFFECTS OF PROTEIN ON MUSCLE, BONE, AND FRAILTY**

As you age, increasing dietary protein helps maintain **muscle mass** and **bone density**, preventing **frailty**, loss of function, and other age-related health problems.



### 46 **REDUCE NIGHTTIME BATHROOM VISITS**

In a **clinical study**, five compounds **reduced** the frequency of nighttime urination. No **participants** woke up more than **once** a night and **nocturia** dropped by **64%**.



### 63 **REGENERATIVE MEDICINE CONFERENCE**

This year's biomedical conference features physicians and scientists discussing **age reversal** with a new format that enables more group interactions.



### 66 **CURCUMIN'S MULTIPLE DIABETES BENEFITS**

In clinical trials **curcumin** reduced many risk factors for **type II diabetes** including **insulin resistance**.

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