

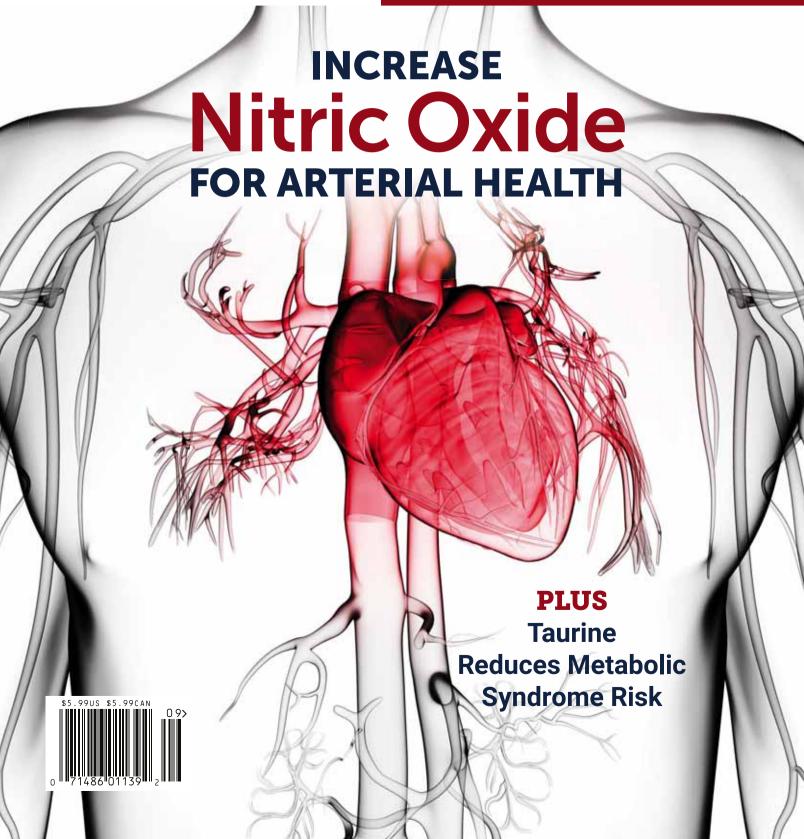
The Science of a Healthier Life®

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September 2024

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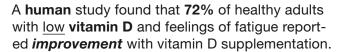


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A dynamo at 103, Sedell Rand has been following a healthy lifestyle. She credits her longevity to "good food, good living, taking vitamins, and staying active..."











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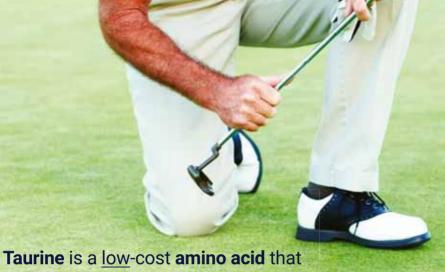
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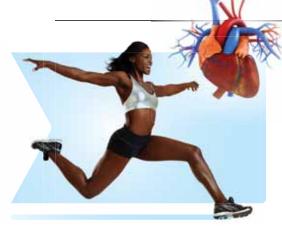
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Why Arteries Stiffen with Age



WILLIAM FALOON



In youth, **arteries** effortlessly **expand** and **contract** with each heartbeat.

As we age, arteries lose functional **elasticity**, which contributes to **cardiovascular** disorders.

An underlying cause of **arterial stiffening** is the age-related decline in endothelial *nitric oxide*.

Endothelial dysfunction is associated with decreased *nitric oxide* that contributes to:¹⁻⁵

- Hypertension
- Atherosclerosis
- Inflammation
- Heart Attack/Stroke

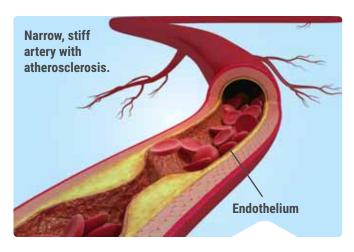
Protecting against **endothelial dysfunction** is a critical objective for heart-healthy diets, drugs, nutrients, and lifestyles.

The challenge has been to <u>increase</u> **nitric oxide** to restore more **flexibility** to our aging vasculature.

Nitric oxide is synthesized in our bodies primarily from the amino acid **arginine**.⁶

Preclinical evidence suggests that an argininedegrading enzyme called **arginase** may <u>increase</u> with **age**. This deprives the **endothelium** of *nitric* **oxide** needed for youthful functionality.⁷ A proposed solution is a long-acting **arginine** that resists *enzymatic* degradation.

In two **clinical trials**, a novel **arginine** compound increased **flow-mediated dilation** and **salivary nitrite levels** (a marker of *nitric oxide* production).^{8,9}



- The endothelium is a thin layer of cells that line blood vessel walls.
- Endothelial dysfunction refers to malfunction of the inner arterial lining.

Support for Aging Arteries

People who follow a healthy lifestyle often develop a false sense of security that they will not suffer the circulatory disorders that are the leading killers in the Western world.

One reason for this optimism is that heart disease death rates declined dramatically from 1969 to 2014.10 Much of this can be attributed to reduced tobacco use, improved diets and medical treatments, better control of hypertension, along with increased use of supplements and drugs that lower heart attack risk.11

Regrettably, today's obesity epidemic is reversing the trend of reduced heart disease prevalence.12

Atherosclerosis is most often associated with heart attack risk, but many age-related disorders, including kidney impairment and memory loss, are related to circulatory insufficiencies. 13,14

Sales of sex-enhancing drugs are popular mainly because so many men suffer from erectile dysfunction caused by endothelial dysfunction.15

Arginine: The Nitric Oxide Precursor

Nitric oxide is synthesized in the body primarily from the amino acid L-arginine.6

Since the mid-1980s, arginine has been a popular supplement for people wanting to protect against *nitric* oxide deficit.

In preclinical and clinical studies, L-arginine has demonstrated other benefits, such as accelerating wound healing, and helping to maintain kidney function.17-19

The most important role of L-arginine is its ability to produce nitric oxide, and thus protect against endothelial dysfunction (and subsequent atherosclerosis risk).1,20

The elderly often suffer from accelerated atherosclerosis.²¹ One reason, preclinical studies suggest, is that the **arginine-degrading** enzyme **arginase** may increase with age, thus causing disruption to the endothelial lining.7

It is encouraging that arginine can help reverse this type of atherogenic endothelial event.²⁰ The challenge has been how to achieve more sustained arginine blood levels.

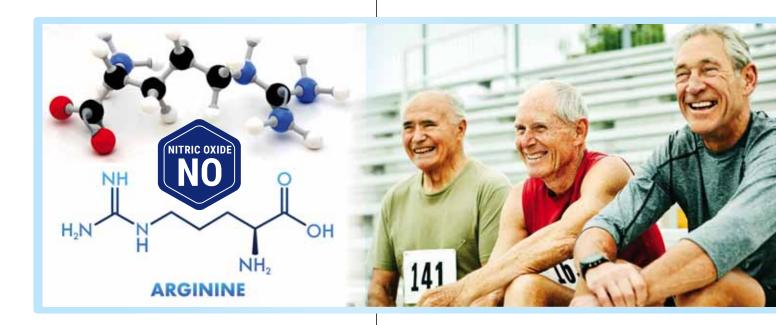
Nitric Oxide Deficit

Nitric oxide bioavailability tends to decline with age, impairing the ability of blood vessels to dilate as needed.22,23

A **nitric oxide** deficit results in disruption of healthy endothelial function and structure.23

Arginase is an enzyme present in multiple tissues in the body.²⁴ In the intestinal tract, arginase **degrades** about 40% of ingested arginine before it can be absorbed into the bloodstream.25





Once in the bloodstream, L-arginine is further degraded by other enzymes, with only a small amount remaining that can synthesize endothelial nitric oxide.26

Reversing Arterial Stiffness

In one animal study, when the arginase enzyme was blocked in rat arteries, arterial dilation was increased. In this study, arterial dilation of young animals increased only modestly in response to arginase-blockade. In old animals, however, arterial dilation was increased to levels observed in young animals when arginase was blocked!27

This study found that the arteries of old rats (23 months old) regained the same vasodilation as young rats (three months old) in response to blocking the arginine-degrading arginase.

This rat study provides evidence of the adverse effects that aging has on the endothelium. More important, it demonstrated that aged arteries may be improved by providing the vascular system with more L-arginine.

Studies show that 60- to 70-year-old humans lose up to 90% of their endothelial nitric oxide production compared to healthy 20-year-olds.28 This helps explain why so many elderly people suffer vascular disorders, and how fast they sometimes worsen after initial diagnosis.

A decades-long challenge has been enabling older people to derive arginine's nitric oxide-boosting benefits. The main impediment is the rapid degradation of arginine in the intestines and blood.26

Overcoming Arginine's Limitations

The major drawback to L-arginine has been that to achieve sustained blood levels, people had to take high doses throughout the day.

It was difficult to comply with this rigorous dosing requirement and there may be gastrointestinal side effects with ingesting this much arginine on a daily basis.⁴³

A more troublesome shortcoming of L-arginine is preclinical evidence suggesting an age-related increase in the activity of enzymes that rapidly degrade arginine.7,27 This means that little ingested arginine is available to promote *nitric oxide* synthesis.²⁵

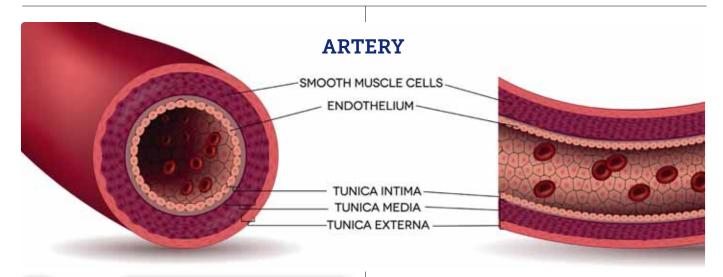
For people with increased arginase activity, supplemental L-arginine may not support adequate nitric oxide synthesis to protect against endothelial dysfunction.

The article on page 34 of this month's issue describes a stabilized L-arginine that was demonstrated in two clinical trials to increase a marker of nitric oxide production and improve flow-mediated arterial dilation.

For longer life,

William Faloon, Co-Founder

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Protect Against Endothelial Dysfunction

Folate, vitamin C, fish oil, and lipoic acid are a few of the nutrients that help maintain healthy endothelial function. 29-33

It is no coincidence that these same nutrients have been shown in some studies. to reduce the incidence of cardiovascular pathology in animals and humans.34-39

Statin drugs and agents that suppress chronic inflammation also help protect the endothelium.40-42

Nitric oxide is an important factor required for the endothelium to function properly.

The amino acid **L-arginine** serves as a precursor to *nitric oxide* in the body.



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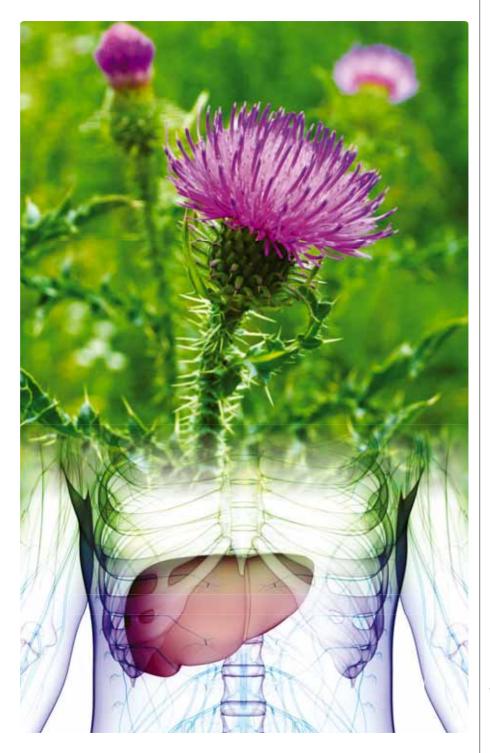
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In the News



Silymarin Improves Nonalcoholic Fatty Liver Disease

A systematic review and metaanalysis of clinical trials concluded that silymarin, which occurs in a plant known as milk thistle, helps improve liver damage and liver fat in people with nonalcoholic fatty liver disease (NAFLD). *

The meta-analysis included 26 randomized trials involving a total of 2,375 men and women with fatty liver disease. The trials compared the effects of various regimens with or without the addition of silymarin or compared silymarin to a placebo.

Participants who received silymarin had reductions in total cholesterol, triglycerides, LDL cholesterol, fasting blood glucose, fasting insulin, insulin resistance, the liver enzymes ALT and AST, as well as an increase in HDL cholesterol in comparison with the control groups.

Fatty liver index, fatty liver score, hepatic steatosis grade and BMI were lower among the silymarintreated groups.

Editor's Note: "Silymarin can regulate energy metabolism, attenuate liver damage, and improve liver histology in NAFLD patients," the authors concluded.

* Ann Hepatol. 2024 Mar-Apr;29(2):101174.

Less Jet Lag with **French Maritime Pine Bark Extract**

An extract of a proprietary form of French maritime pine bark helped reduce jet-lag symptoms for pilots, flight attendants, air company staff, frequent flyers, non-staff professionals, and individuals with hypertension, a recent study showed.*

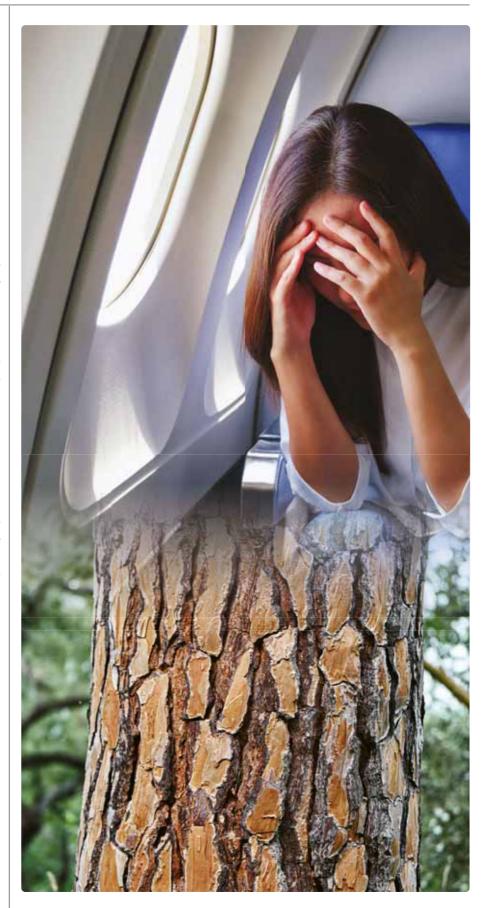
Jet-lag symptoms and nights of altered sleep after flying for 10-12 hours were reduced among participants who were given French maritime pine bark compared to those who did not receive it.

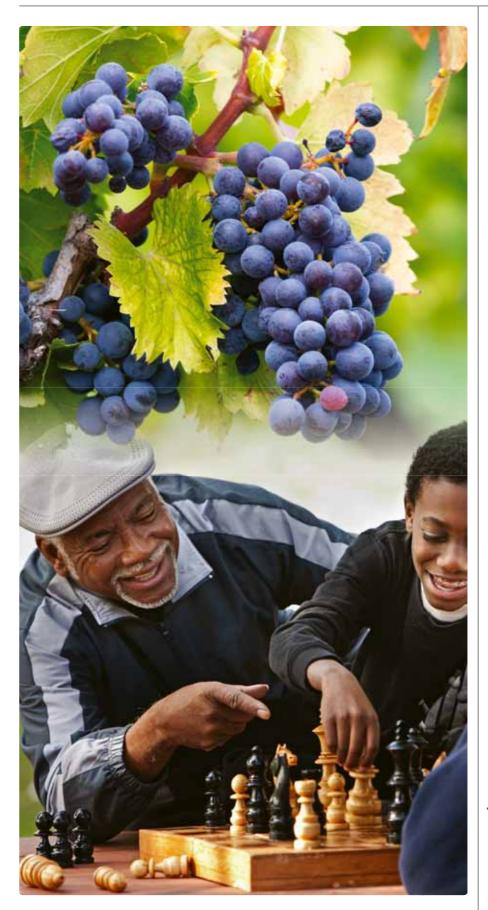
Ankle circumference increased to a lesser extent among those who took the extract, indicating less lower leg fluid retention.

Although cognitive function was negatively impacted among most participants, those who used French maritime pine bark had higher average post-flight cognitive function scores than the control group.

Editor's Note: The study included 127 men and women who travelled on eastbound flights. Sixty-five participants received 50 mg French maritime pine bark every eight hours for seven days beginning 48 hours prior to flying. The other 62 participants served as a control group.

* Minerva Med. 2024;115(2):178-84.





Resveratrol Shows Promise for Vascular Cognitive Impairment

Patients with carotid artery stenosis or occlusion-narrowing or blockage of the carotid arteries that supply blood to the brain—were studied.

Those who used resveratrol had improved cognition, including memory, as well as increased blood flow to the brain, according to the results of a study published in the Journal of Stroke.*

The study included 79 older participants with carotid artery stenosis or occlusion who did not have symptoms. Thirty-six patients received **30 mg** per day resveratrol and the remainder received medical treatment for vascular and metabolic risk factors.

In the **resveratrol** group, systolic blood pressure and blood glucose were decreased, but were increased among those who did not receive it.

Long-term treatment with **resveratrol** was associated with improvement in aspects of cognitive function and memory and greater blood flow in the brain's cerebrum, compared to those who did not receive it.

Editor's Note: There was an average followup period of 221 days for patients who received resveratrol and 245 days for those who did not.

* J Stroke. 2024 Jan; 26(1):64-74.

Taurine Intake Associated with Lower Risk of **Metabolic Syndrome**

A systematic meta-analysis of randomized controlled trials found reduced metabolic syndrome factors in people given the amino acid taurine.*

Metabolic syndrome occurs when people have three of five factors that include increased waist circumference, elevated blood pressure, high fasting blood glucose levels, high triglyceride levels and reduced highdensity lipoprotein cholesterol.

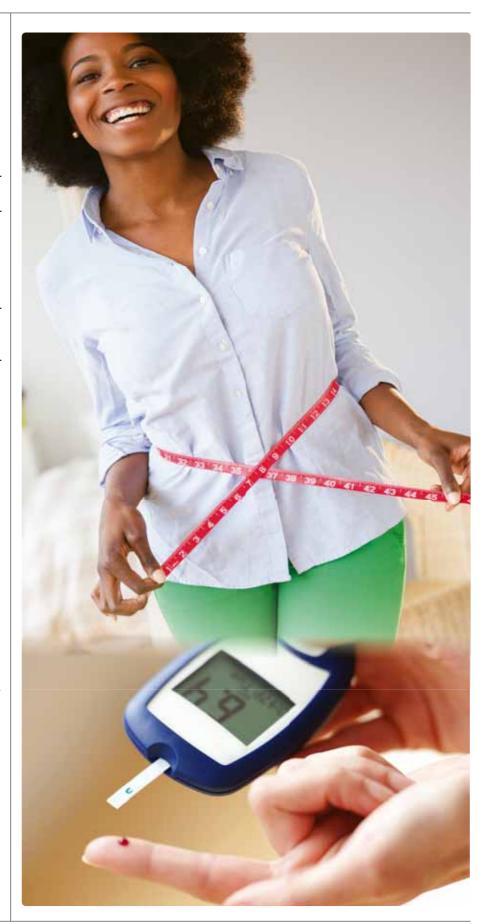
Researchers identified 25 trials in which participants were given taurine in doses ranging from 500 milligrams to 6,000 milligrams per day or another treatment for five days to one year. Blood samples were collected before and after the intervention.

Participants who received taurine experienced reductions in systolic blood pressure, diastolic blood pressure, fasting blood glucose and triglycerides.

Evaluation of secondary outcomes among participants given taurine showed reductions in total and LDL cholesterol, hemoglobin A1C and fasting insulin.

Editor's Note: Having metabolic syndrome increases the risk of type II diabetes and cardiovascular disease.

* Nutr Diabetes. 2024 May 16;14(1):29.





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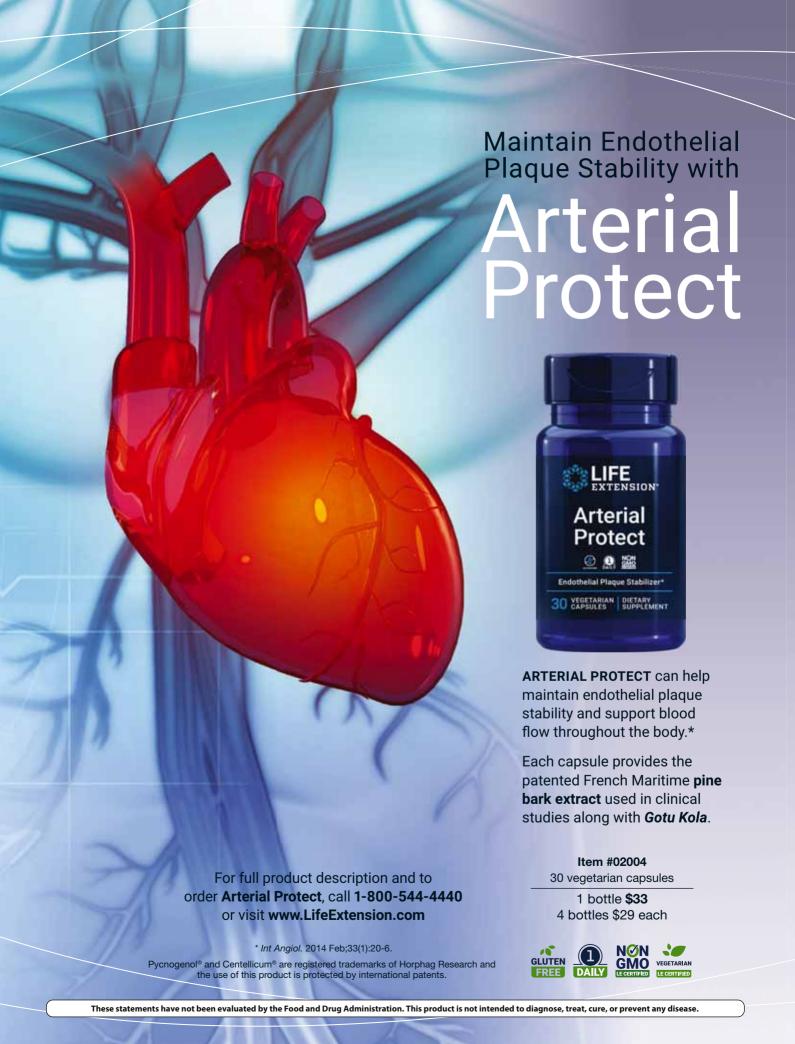
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Fight FATIGUE with VITAMIN D

BY RICK THATCHER

Up to a **third** of all patients visiting their primary care doctors report feeling **fatigue**. 1,2

Yet physicians rarely come up with an explanation for it, because there are so many possible causes.^{1,2}

But there *is* a common link in many cases: **Fatigue** is often associated with <u>low **vitamin D**</u> levels.³⁻⁹

Vitamin D is instrumental in regulating biological processes that have been tied to fatigue, including neurotransmitter balance in the brain, inflammation, and more.⁴

Studies have found that <u>increasing</u> **vitamin D** intake can help <u>reduce</u> symptoms of **fatigue**, whether tied to a medical condition or not.^{2,10-14}

Causes of Fatigue

Fatigue is one of the most common complaints doctors hear in their clinics.^{1,2} Its prevalence rises with **age**.¹

It can refer to **mental** or **emotional** lethargy and to **physical** exhaustion and muscle weakness.

Some **medical conditions** associated with fatigue include autoimmune conditions, infections, cancer, mental illness, and endocrine disorders.^{1,4}

Cases may also be associated with sleep disturbances, stress, diet, and environmental factors.

Yet for the large majority of people complaining of fatigue, there is no obvious cause.²

However, although many factors may contribute to fatigue, research has revealed that <u>one</u> vitamin may be a critical factor that ties together many cases: **vitamin D**.

The Vitamin D Link

Many cases of **fatigue**, including those without an obvious cause *and* those tied to a medical condition, are associated with low **vitamin D** levels.^{4,5}

For example, fatigue is common in **older** individuals, 1,3,4,9 as are low vitamin **D** levels. 15

In this group, studies have found a strong association between both **mental** and **physical fatigue** and <u>low</u> levels of **vitamin D**.^{3,4,9} In fact, one study found that the *lower* the vitamin D levels, the *more severe* the fatigue.⁹

Low vitamin D is also often found in many **medical conditions** associated with fatigue. Patients with fibromyalgia, multiple sclerosis, rheumatological diseases, cancer, and neurodegenerative disorders often have low levels or a deficiency of vitamin D.^{4,6,7}

Even work-related fatigue may correlate with lower vitamin D levels. In one study of 200 female nurses with a high prevalence of fatigue, 89% suffered from vitamin D deficiency.⁸ The researchers concluded that their high rate of fatigue could be attributed to low vitamin D levels.

Low Vitamin D Drives Fatigue

Whether a cause can be identified or not, **fatigue** is driven by several biological factors.⁴

Many of these can be linked to suboptimal **vitamin D** levels, including:

- Neurotransmitter imbalances. Mental and emotional fatigue can be related to alterations in the activity of several neurotransmitters in the brain, particularly dopamine and serotonin.⁴ Vitamin D is involved in the synthesis and activity of these and other neurotransmitters.⁴ Deficiency of vitamin D can contribute to imbalances that may lead to fatigue.
- Cellular stress. Vitamin D plays an important role in the body's defenses against oxidative stress. Without sufficient vitamin D, stress and cellular damage worsen, which contributes to chronic fatigue.⁴



- Low klotho. Klotho is an anti-aging protein with various functions. 16 In animal models, blocking klotho significantly shortens lifespan, while increasing its activity extends it. Vitamin D activity helps increase levels of this protein, boosting resistance to cellular stress and associated fatigue.4
- Immunity. Fatigue has been tied to aspects of suboptimal immune balance, including increased production of pro-inflammatory compounds.4 Vitamin D helps counter these alterations, reducing production of inflammatory compounds and supporting healthy immune balance.^{4,5}
- Gene expression changes. When adequate levels of vitamin D are available, genes tied to cellular protection, antioxidant defenses, immune function, growth factors, and more are all favorably expressed. This means they are appropriately "turned on or off" in response to the body's needs. This helps minimize contributions to fatigue and maximize cellular health and defense.4

Reducing Fatigue

Many adults suffer from inadequate levels of vitamin D. These lower levels have been tied to different forms of age-related chronic disease.17

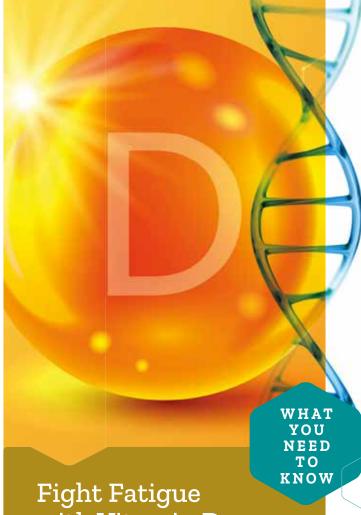
As a result, taking **oral vitamin D** to maintain optimal levels is widely encouraged by physicians.

Boosting vitamin D levels also can result in improvements in fatigue.

In one study, more than 77% of adult patients complaining of fatigue had low vitamin D.2 After taking oral vitamin D to normalize levels, fatigue scores improved in all categories, including physical, emotional, and mental fatigue.

Average fatigue scores (the higher the number, the more severe the fatigue) dropped from **31.5** points when the study began to 11 points after vitamin D levels were increased, an improvement of more than 20 points, or 65%. A change of just 4 to 11 points is considered clinically important.18

In another study, healthy adults with low vitamin D and feelings of fatigue received either a single, large dose of vitamin D or a placebo. In those receiving vitamin D, fatigue scores decreased and 72% reported improvement in their fatigue. The more vitamin D levels rose, the greater the reduction in fatigue.13



with Vitamin D

- **Fatigue** is reported to doctors at up to **33**% of primary care visits. It is increasingly common with age and often has no clear medical cause.
- Researchers have found that many fatigue cases are associated with low vitamin D levels.
- Vitamin D helps counteract many of the biological mechanisms that are tied to fatigue.
- Human studies show that increasing vitamin D levels through oral intake can reduce fatigue.

Several studies have shown that vitamin D intake can also reduce fatigue related to **disease**. For example, taking vitamin D improved symptoms of **fatigue** in studies of patients with multiple sclerosis, kidney transplants, and lupus.^{10-12,14}

Daily oral doses of **5,000-8,000 IU** of **vitamin D3** can help maintain optimal blood levels to fight fatigue. The *25-hydroxy vitamin D* blood test is used to assess and adjust dose. **Life Extension** considers **50-80 ng/mL** of *25-hydroxy vitamin D* to be an optimal level.

Summary

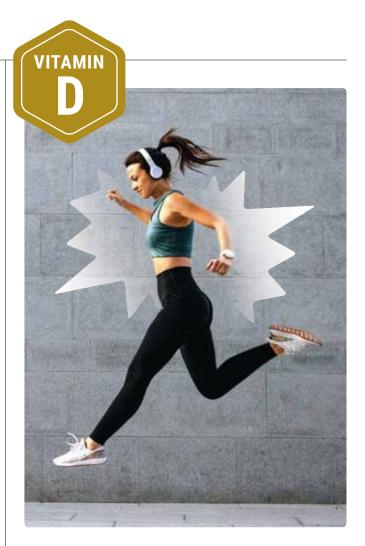
Most cases of **fatigue** have no obvious cause, making them difficult to treat. But they are often associated with **low vitamin D** levels.

Studies have shown that taking **oral vitamin D** to *increase* low vitamin D levels can *reduce* fatigue in healthy adults *and* in those with medical conditions associated with fatigue. •

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

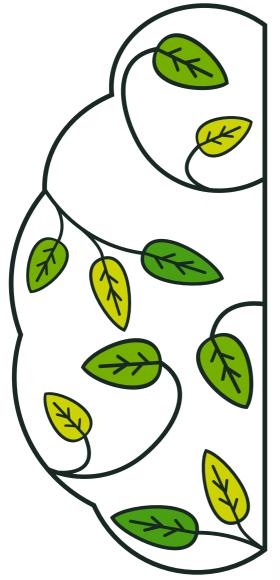
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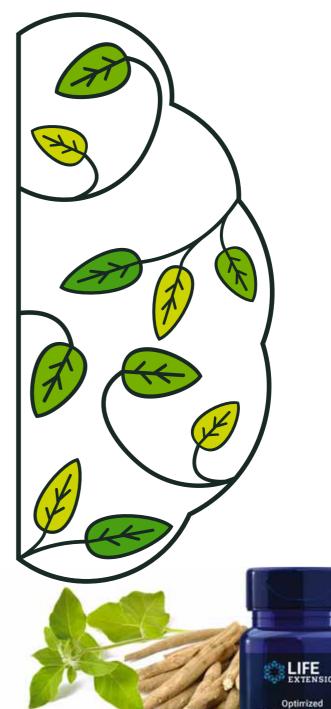




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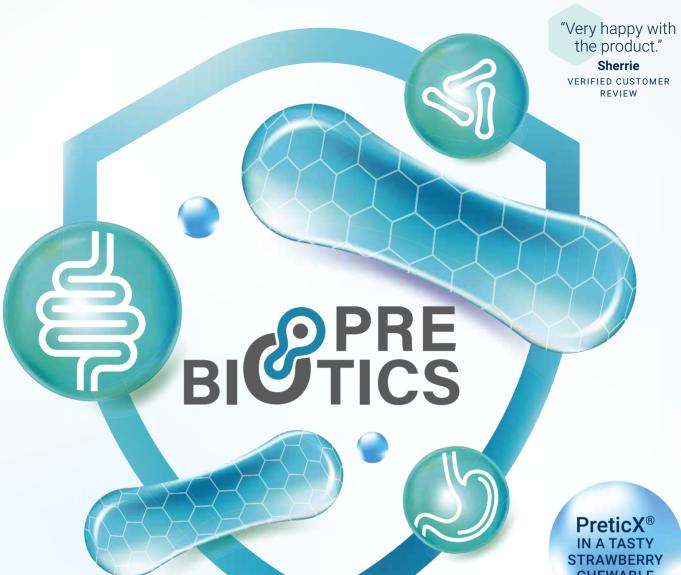


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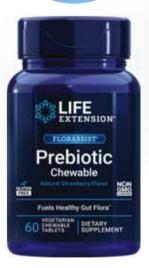
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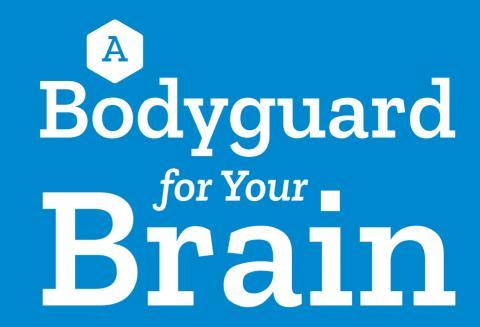








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In epidemiological studies higher dietary intake of lithium (drinking water) is associated with lower risk of mortality.6-8

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In epidemiological studies, higher intake correlates with longer healthspan.9-11 A one-year study showed that a diet enhanced with spermidine daily improved memory scores.12

Consumers have used some of these nutrients for decades, albeit at lower potencies than what may be optimal for healthy aging.

New Healthy Aging Powder provides the following in one scoop:

Taurine

5,000 mg

Lithium

2,000 mcg

Spermidine 3,000 mcg

(0.2% standardization from 1,500 mg Wheat germ extract)

These nutrients may promote healthy aging by supporting cardiovascular health, exercise performance, and cognitive function.

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1 jar **\$27**

4 jars \$25.50 each

The full dose is one scoop daily mixed with water or juice.



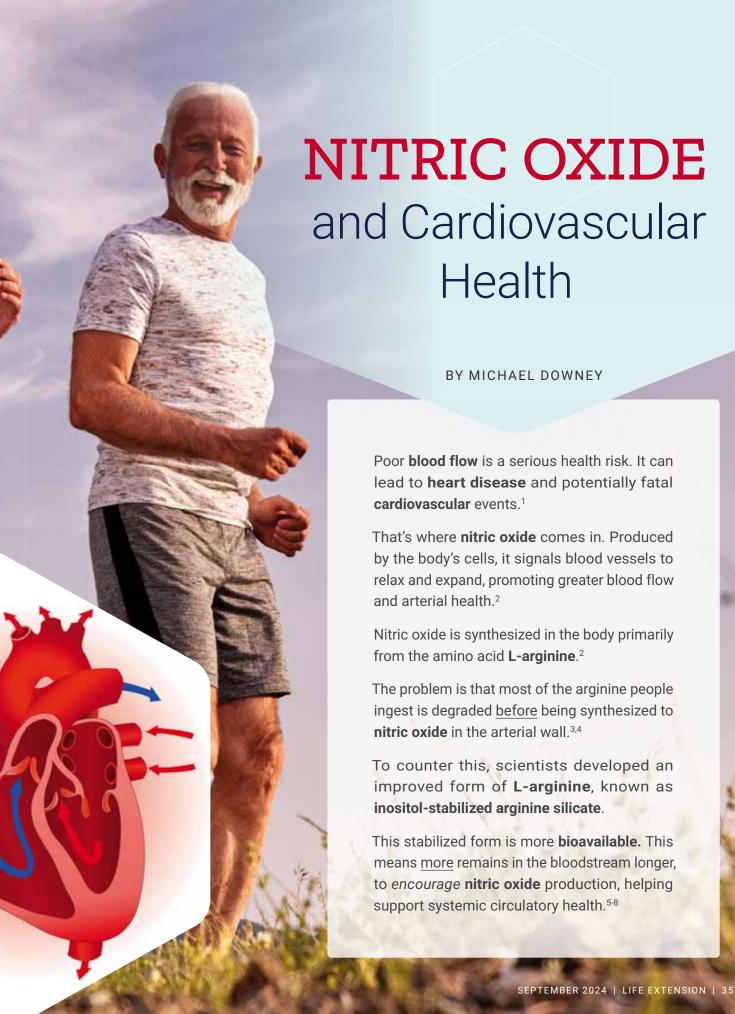


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The Importance of Nitric Oxide

As we age, the risk of developing **cardiovascular disease** increases.

One reason is endothelial dysfunction.9-11

The *inner lining* of our arteries, called the **endo-thelium**, plays a critical role in regulating the flow of blood.⁹⁻¹¹

It does so by producing **nitric oxide**, which signals blood vessels to **dilate** (widen/relax).¹⁰ This allows for greater blood flow to tissues, including the **heart** and **brain**.

However, as we age, our bodies tend to make *less* nitric oxide. ^{12,13} Because of this, blood vessels may be unable to dilate as needed, reducing blood flow. ¹³⁻¹⁶

The consequences of this **endothelial dysfunction** include diminished circulation, high blood pressure, abnormal clotting, and atherosclerosis (the buildup of plaque in arteries). These are major causes of cardiovascular disease, strokes, heart attacks, and **sudden cardiac death**. 9,10,17,18

Endothelial dysfunction is surprisingly common. It can lead to a host of problems including increased risks of dementia and kidney failure. 14,19,20

But if we can *increase* the **nitric oxide** in our blood vessels, it may stop and even *reverse* **endothelial dysfunction**.

L-Arginine's Essential Role

Nitric oxide is synthesized in the body primarily from the amino acid L-arginine—a direct precursor that blood vessels use to make **nitric oxide**.²¹

To work properly, blood vessels make **nitric oxide** for *themselves* from the amino acid **L-arginine**.

Scientists evaluated whether taking **oral L-arginine** improved blood vessel dilation, with the goal of improving systemic circulation and lowering risk for vascular diseases.²²⁻²⁷

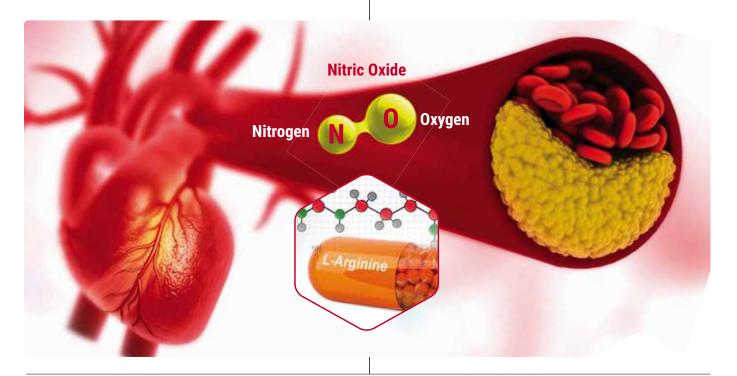
In a **clinical trial**, patients with high blood pressure were given a single dose of **L-arginine** or a placebo. Measurements were taken of **flow-mediated dilation (FMD)**–how much a blood vessel widens in response to an increase in blood flow.²⁷

While the **placebo** group had no change in blood vessel dilation, flow-mediated dilation in those receiving **L-arginine** improved from an average of **1.7%** to **5.9%**.²⁷

Considering that each 1% improvement in flow-mediated dilation has been correlated with a 12% lower risk of cardiovascular events such as heart attack and stroke, the maintenance of endothelial health is critical.^{28,29}

Some longer-term clinical studies demonstrate that L-arginine supplementation can lower blood pressure and reduce symptoms associated with coronary artery disease.^{22,30}

L-arginine, however, is quickly metabolized and eliminated from the bloodstream.^{3,4}





Longer-Acting Arginine

A key drawback to taking **L-arginine** has been that it needs about an hour to take effect and does not stay in the bloodstream for long.⁶

An enzyme called **arginase** degrades about **40%** of ingested arginine within the intestinal tract *before* it can be absorbed into the bloodstream.^{31,32}

L-arginine is further degraded by other *enzymes* in the bloodstream, leaving only a small amount available to be converted to **nitric oxide**.⁴

Seeking a way around this problem, scientists developed a more **bioavailable** form of L-arginine called **inositol-stabilized arginine silicate** that allows L-arginine to remain present in the plasma for a greater length of time.^{5,6,33}

Clinical studies have demonstrated that in response to *inositol-stabilized arginine silicate*, arginine levels in the blood were increased within **30 minutes** and plasma arginine levels were sustained for up to **six hours**.^{5,6,33}

How It Works

L-arginine supports production of **nitric oxide**.

Inositol-stabilized arginine silicate raises plasma levels of arginine and encourages production of nitric oxide, which helps improve blood flow.⁵⁻⁷

Inositol-stabilized arginine silicate appears to keep L-arginine levels *higher* because it inhibits **arginase**, the primary enzyme that breaks down L-arginine.³³

Boost Nitric Oxide Levels

- The body produces **nitric oxide**, a gas that signals blood vessels to dilate, allowing blood to flow through.
- Aging tends to decrease nitric oxide production, contributing to endothelial dysfunction and an increased risk for cardiovascular disease, heart attacks, and strokes.
- L-arginine is an amino acid the body uses to make nitric oxide. Scientists have developed a more bioavailable form of L-arginine called inositol-stabilized arginine silicate.
- This superior form promotes higher L-arginine levels in the bloodstream for a longer period. That can significantly boost nitric oxide production, reducing risk for cardiovascular events.
- In a clinical trial, consumption of inositol-stabilized arginine silicate was found to be associated with a significant improvement in flow-mediated dilation.

This allows *more* L-arginine to enter the blood and circulate *longer* compared to standard L-arginine.³³

As a result, this stabilized form of L-arginine has demonstrated clinical benefits that standard L-arginine has not been shown to achieve.7,8

In a three-arm crossover design trial of physically active males with normal blood pressure, participants received a one-time dose of either8:

- 1,500 mg of inositol-stabilized arginine silicate,
- 8 grams of citrulline malate (indirect precursor to nitric oxide), or
- placebo.

Flow-mediated dilation of the brachial artery was measured before ingestion of the supplement and one hour after. After the single dose there was a washout period of 7-28 days. It was found that the single dose of inositol-stabilized arginine silicate or citrulline resulted in improvements in flow-mediated dilation of about 31%, compared to placebo.

In another clinical trial, subjects taking 1,500 mg of this improved form of L-arginine daily had reduced markers of post-workout muscle damage and reported greater feelings of energy than those taking a placebo.7

Encouraging the synthesis of nitric oxide with inositol-stabilized arginine silicate is one way to support cardiovascular health.

Summary

Nitric oxide is produced by the body to support blood flow, improving circulatory and cardiovascular health.

Nitric oxide production tends to decline with age, and this decline has a negative impact on endothelial function. Endothelial dysfunction is a contributor to atherosclerosis and increases the risk of cardiovascular disease, heart attacks, and strokes.

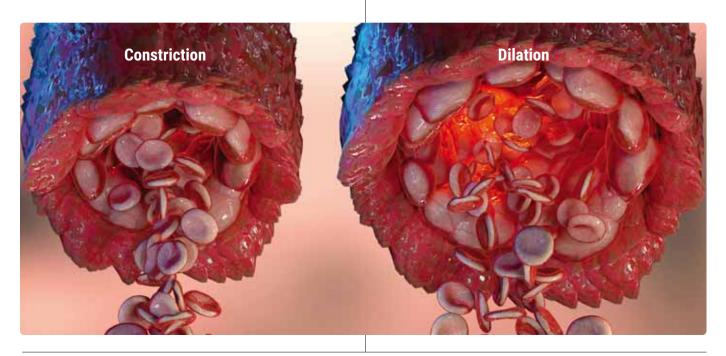
L-arginine is the amino acid the body uses to make nitric oxide. Taken orally, it gets degraded by enzymes and only a small amount is available to support the endothelium.

Scientists have developed a better form of L-arginine called inositol-stabilized arginine silicate. More of it is absorbed into the bloodstream after ingestion and it remains in the body for a longer time.

This improved L-arginine may boost nitric oxide production, reducing the risk for cardiovascular events. •

> (See ARGININE Breakdown Flowchart on 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.



ARGININE'S Formidable Task in Converting to NITRIC OXIDE Ingested ARGININE 40% degraded by Intestinal ARGINASE Additional ARGININE DEGRADATION by Enzymes in the blood ARGININE ARGININE DECARBOXYLASE ARGININE DECARBOXYLASE Remaining ARGININE Synthesized by NITRIC OXIDE SYNTHASE to Endothelial NITRIC OXIDE

The typical American ingests about **4.5 grams** of arginine each day.⁴

But only a tiny amount of ingested arginine is available to convert to endothelial **nitric oxide**.

When arginine is ingested, a substantial percentage of it (about **40**%) is degraded in the small intestine by the enzyme *arginase*. This enzyme is naturally present to degrade the dietary arginine humans ingest each day. ⁴

After the remaining **intestinal arginine** is absorbed into the blood, there are more enzymes that rapidly degrade it into a variety of metabolites including ornithine, creatine, proline, glutamine, and various polyamines.

The primary *enzymes* that degrade **arginine** are:

- Arginase,
- Arginine decarboxylase, and
- Arginine Glycine amidinotransferase.

Any arginine that is spared from enzymatic degradation in the body can be converted by the enzyme *nitric oxide* synthase into **nitric oxide**.⁴

Some studies show that supplemental arginine increases nitric oxide levels in the body, while other studies reveal no increase in nitric oxide levels in response to arginine supplementation.^{34,35}

The reason that standard arginine does <u>not</u> consistently elevate **nitric oxide** may be that not enough arginine is able to be acted upon by *nitric oxide synthase* to produce **endothelial nitric oxide**.

Around four hours after standard arginine is ingested, blood levels of arginine return to baseline.³⁶

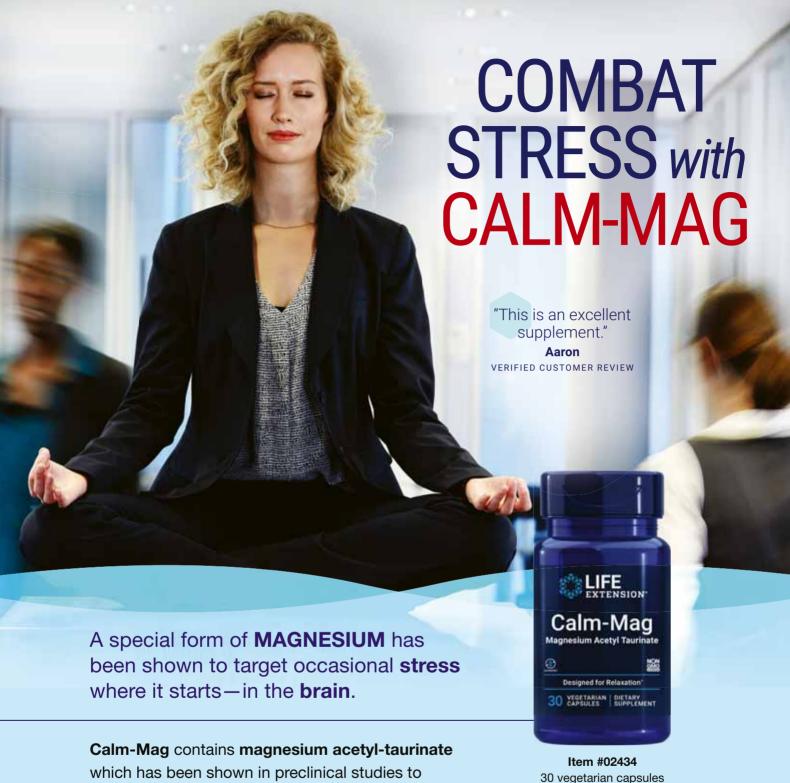
A new stabilized arginine formula reduces enzymatic degradation by arginase to enable higher blood levels of arginine, sustained for about six hours, to support production of endothelial nitric oxide.³³

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Nitrosigine® is a registered trademark of Nutrition 21, LLC. Nitrosigine® is patent protected.





Prevent Damage from CHRONIC STRESS



BY HEATHER L. MAKAR

When we face physical or emotional stress, the hormone **cortisol** helps us cope.

In the short term, that's a huge benefit. In the long term, it can be a disaster.

When cortisol remains *persistently high*, it can wreak havoc on our health, aging us faster, putting us at risk of numerous diseases, and *shortening our lives*.

In a population study, men with <u>high</u> cortisol levels faced a **63**% <u>increased</u> risk of **death** and women with elevated cortisol levels had an **82**% <u>increased</u> risk of **death**.¹

In another study, the risk of death from cardiovascular disease escalated five-fold in those with high cortisol levels.²

Several **plant extracts** have been clinically shown to help <u>reduce</u> elevated **cortisol** levels. This may help prevent the damage inflicted by cortisol and potentially decrease risks of premature death.

Chronically Elevated Cortisol Is Deadly

Cortisol is a hormone produced primarily in the adrenal glands. Under normal circumstances, cortisol functions to regulate the body's metabolism of glucose.

It's often referred to as the "stress hormone" since it's also released in response to physical or emotional stress.

Cortisol levels normally fluctuate throughout the day, rising just before you wake in the morning and tapering off through the evening in preparation for sleep.3

However, chronic stress disrupts this daily rhythm, which may cause cortisol levels to remain persistently high.4,5

Cortisol levels also tend to rise in older age.^{6,7} The results can be deadly.

Chronically elevated cortisol speeds up the aging process through decreased immunity, increased inflammation, and dysregulated metabolism.8

High levels of cortisol are also associated with shortening of telomeres, the protective caps on the ends of chromosomes.^{9,10} Telomere shortening is associated with shorter lifespan.

One population study showed that elevated cortisol levels correlate with a significantly higher mortality risk. Men with high cortisol had a 63% increased risk of death, while women had an 82% increased risk.1

And in another study, the risk of death from cardiovascular disease jumped five-fold in those with high cortisol levels, regardless of their cardiovascular health history.2

Other studies confirm that those with elevated cortisol have higher mortality rates and a potentially increased risk for metabolic syndrome, cardiovascular disease, diabetes, and neurodegenerative disorders. 6,11-15

Cortisol may also contribute to thinning hair, wrinkles, age spots, and slower healing of wounds. 16-18

Plant Extracts That Help

Many people turn to anti-anxiety medications or other drugs to manage symptoms of chronic stress. But these often come with side effects and may do little to reduce chronically elevated cortisol, allowing the damage to continue.

Several plant extracts can reduce cortisol levels in humans, safely relieving stress and protecting against the hormone's long-term harm.

These include extracts of lychee fruit, green tea, Magnolia officinalis, and Phellodendron amurense. 19,20

Lychee Lowers Cortisol

Lychee, a tropical fruit rich in health-promoting polyphenols, has the ability to fight oxidative stress and inflammation and lower cortisol levels. 19,21,22

However, most lychee extracts contain long-chain polyphenols, severely limiting their absorption in the intestinal tract.



Scientists have developed a blend of lychee fruit and green tea that provides a low-molecular-size extract that is three to four times as bioavailable as regular lychee. 19,21,23

In a clinical trial, healthy but sedentary young men who took 100 mg of the lychee-green tea extract blend for four weeks had a dramatic reduction in cortisol levels, compared to those who took a placebo.¹⁹

In another clinical trial, healthy male volunteers dipped their legs in hot water, a physical stressor. Those who had taken **100 mg** of the lychee-green tea blend a half-hour earlier had significantly lower blood cortisol levels than those in a placebo group.21

In both studies, the men taking the extracts also had a significant reduction in serum levels of IL-1beta and IL-6, inflammatory cytokines that can cause cortisol levels to rise.

Stress-Relieving Bark Extracts

A combination of bark extracts from two trees. Magnolia officinalis and Phellodendron amurense, has been shown to reduce cortisol and decrease anxiety, without the side effects of prescription medications.24,25

In a study of participants with moderate-to-high stress levels, taking 250 mg of this extract combination twice daily (500 mg total) for four weeks resulted in an 18% reduction in salivary cortisol levels compared to those taking a placebo.²⁵

Those in the extract group also reported a significant reduction in stress, compared to the placebo group, including a:25

- 13% reduction in tension,
- 20% reduction in depression,
- 42% reduction in anger,
- 31% reduction in fatigue,
- 27% reduction in confusion,
- 18% increase in vigor, and
- 11% improvement in mood.

In another **clinical trial**, premenopausal women with anxiety who took 250 mg of the Magnolia-**Phellodendron** bark combination three times daily reported significantly lower anxiety scores after six weeks.24



Reduce Cortisol for Better Health

- Levels of the hormone **cortisol** rise during times of stress.
- Chronically elevated cortisol weakens immunity and is associated with increased risk of chronic disease and death.
- A lychee-green tea extract blend has been clinically shown to significantly reduce cortisol and markers of inflammation.
- A blend of bark extracts from two trees, Magnolia officinalis and Phellodendron amurense, also reduced cortisol levels in clinical trials. In addition, it improved mood and lowered feelings of stress. anger, depression, and fatigue.
- Combining a lychee-green tea blend with Magnolia-Phellodendron bark extracts may optimize their ability to lower cortisol levels, reduce stress and anxiety, and help prevent the damage chronic stress can do.

Combining these bark extracts with the **lychee**green tea blend may maximize their ability to lower cortisol levels, reducing the elevated risk of disease and death that comes with chronic stress.

Summary

Chronic elevated cortisol is a deadly issue.

Aging and chronic **stress** can raise cortisol levels and keep them high, increasing risk of illness and death.

A blend of **lychee** and **green tea** extracts has been clinically shown to lower cortisol levels.

A combination of bark extracts from the *Magnolia* officinalis and *Phellodendron amurense* trees has also been shown to reduce cortisol and lower anxiety and stress.

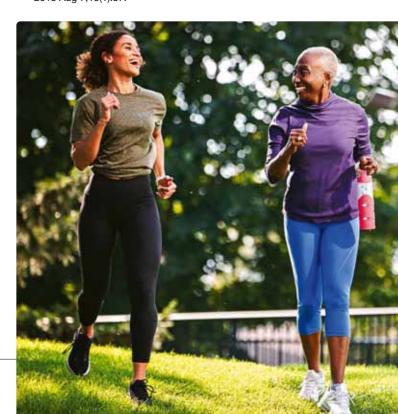
Together, these extracts may optimize cortisol reduction, potentially decreasing the risk of disease and premature death brought on by chronic stress. •

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

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This three-herb blend can help maintain bladder comfort and normal urinary frequency—with women reporting positive results in a clinical study.2

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1. BJU Int. 2009 Aug;104(3):352-60. 2. BMC Complement Altern Med. 2018 Jan 31;18(1):42.

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



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60 vegetarian capsules

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This probiotic has been **clinically studied** to help maintain a healthy **colonic transit time**, **combat occasional constipation**, and **support bowel regularity**.¹

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1. Scand J Gastroenterol. 2011;46:1057-64.



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Advanced Milk Thistle contains standardized, top-grade potencies of *silymarin*, *silybin*, *isosilybin* **A**, and *isosilybin* **B**, providing a full spectrum of liver-supportive compounds.

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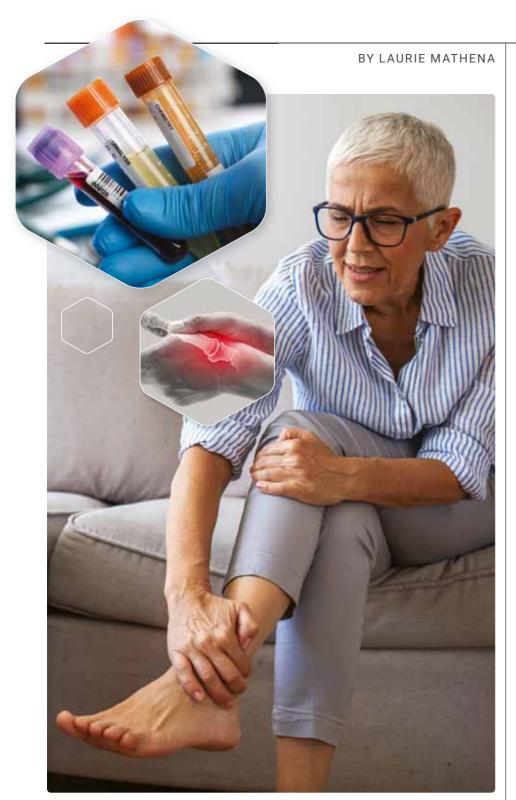




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SILIPHOS® is a registered trademark of Indena S.p.A., Italy.

Safely Lower Uric Acid Levels



Up to **20%** of adults have elevated **uric acid** levels.¹

High **uric acid** levels are associated with gout, kidney stones and kidney disorders.² Uric acid levels have been shown to gradually <u>rise</u> with increasing age.³⁻⁶

An extract from a plant called *Terminalia bellerica* was found in a **clinical trial** to help most participants achieve <u>targeted</u> uric acid levels without prescription medication.⁷

T. bellerica supplementation offers a leap forward in *safely* lowering high **uric acid** levels.

Elevated Uric Acid Can Occur in Many Serious Conditions

Elevated levels of **uric acid** are associated with **gout**, an often-excruciating form of arthritis. But people with cardiovascular and metabolic risks can also have **high** uric acid levels.

These conditions include metabolic syndrome and insulin resistance, elevated blood pressure,⁸ atrial fibrillation,⁹ chronic kidney disease, and cardiovascular disease.⁶ Many people discover they have elevated uric acid when their doctor orders routine **blood work**, even when they are asymptomatic.

Symptomatic gout manifests as pain, inflammation, and/or kidney complications from too much uric acid in the bloodstream. It can begin at any time.

Safely Lower Uric Acid

Researchers have identified an extract called *Terminalia bellerica* that can safely <u>lower</u> uric acid levels.

In one randomized controlled trial, people with elevated uric acid who took **500 mg** of *T. bellerica* twice daily reduced their uric acid by an average of **28.4**% after 24 weeks.⁷ This decrease in uric acid levels enabled **89**% of the participants who took the extract to achieve **targeted** uric acid serum levels.

In another trial, scientists evaluated the effectiveness of *T. bellerica* in people with chronic kidney disease who had elevated uric acid levels.¹⁰

After 24 weeks, those taking **500 mg** of *T. bellerica* twice a day lowered their uric acid by **20%**.

They also experienced improved kidney function. This was demonstrated by several markers, including:

- Increased estimated glomerular filtration rate (eGFR), a measure of kidney function that indicates how efficiently the kidneys are able to filter blood.¹¹
- An 11.5% decrease in creatinine level, a waste product from protein metabolism that is a common marker of kidney function.¹²

Additional benefits included lowered CRP (C-reactive protein), a marker of systemic inflammation) and improved endothelial function (a sign of blood vessel health).

These results indicate the potential benefits of *T. bellerica* for those with kidney disease and high uric acid levels.

Summary

Levels of uric acid rise with age. Elevated uric acid levels have long been known to cause gout, the painful arthritic condition.

They are also a risk factor for kidney stones and other kidney conditions. There is increasing awareness that life-shortening conditions like kidney disease, diabetes, metabolic syndrome, and a wide range of cardiovascular disorders are often accompanied by **high** uric acid levels.

Extracts of *T. bellerica* have been shown to <u>reduce</u> uric acid levels.

Many people have elevated uric acid without knowing it, making it essential to have levels tested yearly.

Life Extension and many physicians consider a blood uric acid level of less than 6.0 as optimal. A uric acid level greater than **8.0** has been used to indicate the need for evaluation and treatment.⁶

Uric acid is included in **Life Extension**®'s CBC/Chemistry/Lipids **blood test** panel that costs only **\$35**.

To order call 1-800-208-3444 or visit www.LifeExtension.com/sales/lab-tests

For a comprehensive review of all treatment and prevention strategies for **gout** please visit the Life Extension protocol. www.LifeExtension.com/gout If you have any questions on the scientific content of this article, please call a **Life Extension** Wellness Specialist at 1-866-864-3027.

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RELIEF

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



Fast-Acting Liquid Melatonin is a popular way to enhance the absorption of melatonin for sleep onset support.

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CAUTION: Do not consume alcohol, drive or operate heavy machinery after taking this product.

Cinnamon

BY LAURIE MATHENA



- Adjuvant in Reducing the Glycemic Biomarkers of Type 2 Diabetes Mellitus: A Three-Month, Randomized, Triple-Blind, Placebo-Controlled Clinical Trial. J Am Nutr Assoc. 2022;41(3):266-74
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Cinnamon is often associated with sugary treats like apple pie, cinnamon rolls, or cinnamon dolce lattes.

But when cinnamon isn't combined with excessive amounts of sugar, it is a spice that has a long history of use in traditional medicine.

Research has highlighted the role that cinnamon can play in managing blood sugar and weight, particularly in type II diabetics and prediabetics.

For example, in a randomized, triple-blind, placebo-controlled trial, type II diabetics taking oral antidiabetic agents were given either three grams of cinnamon powder (about 1.2 tsp) or a placebo.1

After 90 days, those taking the cinnamon had a statistically significant reduction in glycated hemoglobin (0.2%) and fasting blood glucose (10 mg/dl), compared to placebo.

A meta-analysis of 16 studies found that cinnamon reduced fasting blood glucose and homeostatic model assessment for insulin-resistance (HOMA-IR) in diabetics and prediabetics, compared to placebo.2

Earlier this year, a study of obese prediabetics showed that those taking four grams of cinnamon powder per day had lower 24-hour glucose concentrations and lower glucose peaks, compared to placebo.3

In addition to helping manage blood sugar, supplementation with cinnamon has been shown to reduce body weight and body mass index (BMI).4

Most of these studies have indicated that consuming three or more grams (or about 1.2 tsp) of cinnamon is necessary to achieve its benefits.

That amount can easily be added to foods throughout the day by sprinkling cinnamon on various foods, stirring it into your morning coffee, or enjoying cinnamon tea after dinner. •



For full product description and to order Ultra Prostate Formula, call 1-800-544-4440 or visit www.LifeExtension.com

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These **clinical trials** have shown that resveratrol provides benefits for **aged groups** and people with **metabolic diseases** such as obesity and type II diabetes. This indicates that it may support healthy aging for other groups as well.

The Potential of Resveratrol

Resveratrol is a polyphenol found in red wine and grapes, berries, and some other plants.

It has long been thought to provide a possible explanation for the "**French paradox**," the observation that French people, who consume moderate amounts of wine, have low incidence of coronary heart disease despite diets rich in saturated fats.¹

Many experiments involving **short-lived animals** such as flies, worms, bees, fish, and mice have found that resveratrol intake <u>increased</u> **lifespan**.^{2,3} Giving honeybees resveratrol, for example, increased their maximum lifespan by **38**%.⁴

It's very challenging to measure lifespan in human trials, due to our long lives. It is much more practical to measure **biomarkers** that reflect our health status and disease risk.

In the past two decades, scientists have tested resveratrol on multiple **human** biomarkers. In clinical trials, taking resveratrol has been shown to improve:

- Glucose levels and insulin resistance.
- Heart health, and
- Bone health.

Heart and Diabetes Benefits

Type II **diabetes** is characterized by insulin resistance and high blood sugar. It inflicts persistent **oxidative stress** and low-grade **inflammation**, drivers of nearly *all* age-related chronic disease.

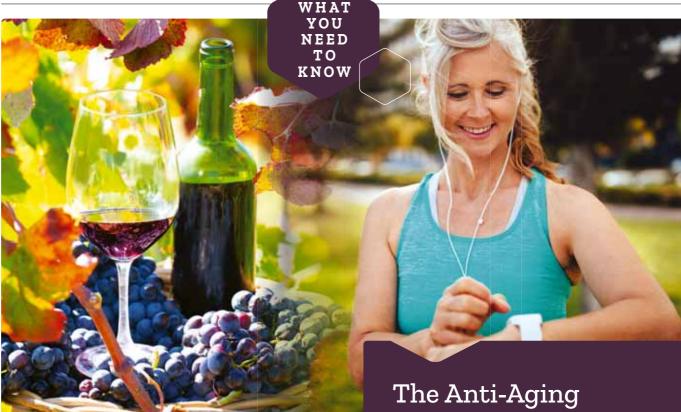
In a clinical trial of 110 adults who suffered from diabetes for at least five years, participants took either **200 mg** of **resveratrol** or a **placebo** daily for 24 weeks. Compared to the placebo, those who received resveratrol had <u>reductions</u> in **fasting glucose**, **hemoglobin A1c** (a marker of glucose levels over time), and markers of **oxidative stress** and **inflammation**.

The researchers report a mean **8.6**% decrease in **fasting insulin** and a **14**% decrease in a marker of **insulin resistance**. Note that fasting **insulin** is often <u>elevated</u> in early-stage type II diabetics. The pancreas secretes high insulin to initially help compensate for the insulin resistance that elevates blood glucose.

In a meta-analysis of 17 randomized, controlled trials of nearly 900 patients with diabetes, those who took at least 500 mg of resveratrol daily <u>lowered</u> fasting glucose, total cholesterol, hemoglobin A1c, and systolic (top number) blood pressure compared to a placebo.⁶

Resveratrol may also improve **cardiac remodeling**, harmful changes in the heart's size, shape, and function that occur in response to cardiac disease or damage.





In a clinical trial published in 2023, 80 people with hypertension who took 400 mg of resveratrol daily for six months, along with conventional therapy, had significantly greater improvements in measurements of cardiac remodeling and markers of oxidative stress, healthy aging, and mitochondrial maintenance compared to those who received conventional therapy alone.7

Strengthening Bones

The body is continuously recycling old bone for new bone in a crucial process known as bone remodeling.

As we age past adulthood, bone breakdown tends to exceed the rate of bone formation. Resveratrol may reverse this, resulting in a net increase in bone formation.8

Different groups of people at high risk of osteoporosis have obtained bone benefits from resveratrol supplementation.

In one trial, men with obesity who took 1,000 mg of resveratrol daily had a 2.6% increase in bone mineral density of the spine after 16 weeks and a 16% increase in bone alkaline phosphatase, a marker for bone formation, after four weeks, compared to a placebo.9

Effects of Resveratrol

- Resveratrol, a compound found in red wine and grapes, has been shown to extend lifespan in animal models.
- In human trials, resveratrol reduced blood glucose levels, insulin resistance, total cholesterol, and markers of oxidative stress and inflammation in adults with type II diabetes.
- Resveratrol also improved cardiac remodeling, harmful changes to the heart resulting from cardiac damage or disease.
- Multiple human trials have shown benefits for **bone health**, including increases in bone density and a marker of bone formation.
- These benefits indicate wide-reaching effects that may promote healthy aging in adults.

Another trial randomized 192 people with type II diabetes to take either resveratrol (40 mg or 500 mg) or a placebo daily. After six months, the placebo group had significantly decreased bone mineral content and density. Both resveratrol groups preserved bone mineral density, and the group that received the **500 mg** dose also preserved **bone mineral** content. Interestingly, in subgroup analyses of alcohol drinkers and those with deficiencies in calcium and vitamin D, resveratrol not only maintained bone mineral density, but *increased* it.¹⁰

In another study, **postmenopausal women** who took **75 mg** of resveratrol twice daily for 12 months had an increase in **bone mineral density** of the femoral neck and lumbar spine and a reduction in the 10-year probability of a major **osteoporotic fracture** or hip fracture. In addition, a marker of bone turnover called **C-terminal** telopeptide was significantly lowered, indicating an improvement in the bone turnover process. A subgroup of those taking resveratrol who also took calcium and **vitamin D** had the greatest improvement in bone density.

These effects on heart and bone health, glucose metabolism, and longevity biomarkers indicate that resveratrol may help promote healthy aging in adults.

Summary

Resveratrol has been credited as a potential **healthy** aging nutrient since the early 2000s, when it was shown to increase lifespan in multiple animal models.

Since then, human trials have found that resveratrol may have biological benefits in aged groups and those with metabolic disease such as obesity and type II diabetes.

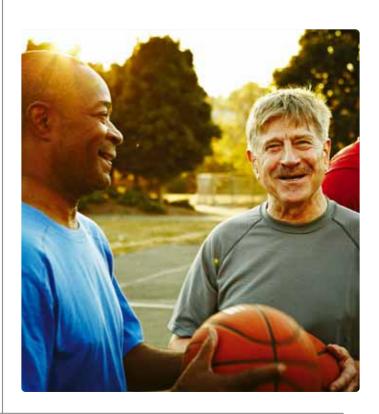
Among other results, it improved the health of the heart and bones, reduced elevated blood sugar. improved insulin sensitivity, and reduced oxidative stress and chronic inflammation.

These benefits may extend to other groups to promote overall healthy aging. •

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

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Sedell Rand at 103 Years Old Life Lessons from a Centenarian

BY LAURIE MATHENA



"I wasn't a troublemaker. I just didn't abide by the rules, that's all," said 103-year-old Sedell Rand with a laugh as she recounted a story from her mischievous childhood.

But as Rand has demonstrated throughout her long life, she hasn't been *breaking* the rules of society, *she's been making new ones*.

From pursuing higher education in the 1940s, to beginning a vitamin and exercise regimen in the 1950s, to starting her own business in the 1970s, Rand has been rewriting the rules for women longer than most people have been alive.

Now, at 103 years old, Rand is living proof that a life of curiosity, a tireless pursuit of knowledge, and a commitment to being proactive with her health have been her keys to a long, fulfilled life.

True Grit

Sedell Rand was born in 1921, in the post-World War I era, just after the passing of the 19th amendment, which gave women the right to vote. Raised in New York City as the daughter of immigrants, Rand learned grit at an early age.

With two older brothers, her father didn't baby her. Instead, when she was just four, he bought her boxing gloves, and her brothers taught her how to use them. She feels this training gave her the tough spirit she needed to survive.

She learned further lessons of determination from her mother, who became a widow with five young children at the age of 42 during the Great Depression.

Those years were formative for her. "I am a product of my growing up," said Rand. "My father died young. I think the things that happened in my life before I was 20 set my life in the way that it went. I had to work all my life."

She worked a job while pursuing a graduate degree at Columbia University. She'd get up at six o'clock in the morning, work all day, go to school all evening, and then do homework until two o'clock in the morning.



"There's a drive within you to accomplish those things," said Rand. "You don't sit back and analyze it at the time. You just do it. You take one step at a time. If you analyzed everything you were doing instead of being motivated, you wouldn't do it."

This determination earned her a master's degree in insurance.

"I wasn't trying to prove myself or obtain more credibility," said Rand. "It was the thing to do for my future life."

Shortly after that, she began her career in life insurance and ultimately started her own successful business— from which she retired only five years ago at age 98.

However, she is still happy to give advice when former clients call.

A Lifetime of Good Habits

When asked the secret to her longevity, Rand said, "I would say it's good food, good living, taking vitamins, and staying active. But ultimately, the real formula can be summed up in two letters, C.S.... Common Sense. It's about having respect for your body and for other people."

Rand still makes the monthly walk to her landlord to pay rent on the Manhattan apartment she's lived in since 1948.

During her last outing, she also made stops at the bank and the local grocer.

"I figured I walked at least a mile by putting one foot in front of the other," noted Rand.

When she's out, she uses a walker that protects her from people bumping into her.

"I live in a major city and people are always rushing or looking at their phone and they walk into you. The walker, which I refer to as my 'chariot', shields me from folks who don't look where they are going," she said.

For decades, Rand has been diligent about working out weekly with a personal trainer. She does balance exercises, wall pushups, sitting to standing without holding on, arm raises, walking up stairs, and more.

"The trainer hits all parts of my anatomy," said Rand. "You can't do it by yourself because what kind of discipline would you have?"

She also began taking vitamins long before it became popular to do so.

"I've been taking vitamins for more than 50 years, and I think they're helping to keep me healthy," said Rand.

For over twenty years, she has been taking supplements. Early on, she followed the work of American chemist Linus Pauling, winner of two unshared Nobel Prizes, who is recognized for his studies on the benefits of vitamin C.

She has learned to research what nutrients she might be lacking, or what supplements could be beneficial for her based on her



specific needs. Her vitamin program rotates and evolves depending on her current health status.

"I'm also fortunate that I don't have any bad habits," said Rand. "I don't smoke. I avoid the sun. I don't drink whiskey now, and wine doesn't really impress me."

In fact, Rand credits her physical fitness, commitment to a healthy diet, and vitamin regimen for being able to walk out of the hospital after having heart surgery in her late 80s.

"If I wasn't physically fit, they wouldn't have done the surgery," said Rand.

Rand participated in the PARTNER trial that was researching a new technique called "percutaneous transcatheter aortic valve replacement," as suggested by Dr. Michael Ozner, a member of Life Extension's Scientific Advisory Board.

Instead of exposing Rand to the complications of open-heart surgery, this minimally invasive procedure involved threading a replacement valve through her leg's femoral artery and inserting it into her malfunctioning aortic valve. This is the same procedure that Mick Jagger, of the Rolling Stones, had in 2019.

Rand was accepted into the study and received the experimental aortic valve.

Five days later, she walked out of the hospital. And just a few weeks after that, she flew to Chicago for a Jane Austin Society meeting.

While Rand has engaged in many of the lifestyle factors now recommended for health and longevity, she still credits much of her success in life, health, and longevity to her mother.

"She gave me good genes," said Rand. She recalled that when her mother died at age 95, she didn't have any wrinkles. "She also fed us lots of fruit and vegetables. You'd be surprised how many people don't grow up eating vegetables."

Rand still chooses to consume a whole food diet filled with fresh produce she buys from a nearby farmer's market.

She says she has five or six varieties of fruit for breakfast. And for dinner, she enjoys salmon or chicken with five or six different vegetables.

Keeping Her Mind Sharp

Rand is an avid reader who believes in the value of pursuing knowledge so that people can think and make decisions for themselves.

"I find it interesting that people don't stop and think," said Rand. "They always copy. They have no desire to really investigate and understand properly."

Rand has a quick-witted sense of humor and enjoys making people laugh—which she plans to continue doing for years to come.

"There's a saying that goes, 'May you live until 120,' said Rand. "I just want to make sure it's with my head in the right place so I can function and think."

If Rand's track record of success is any indication, she is well on her way. •

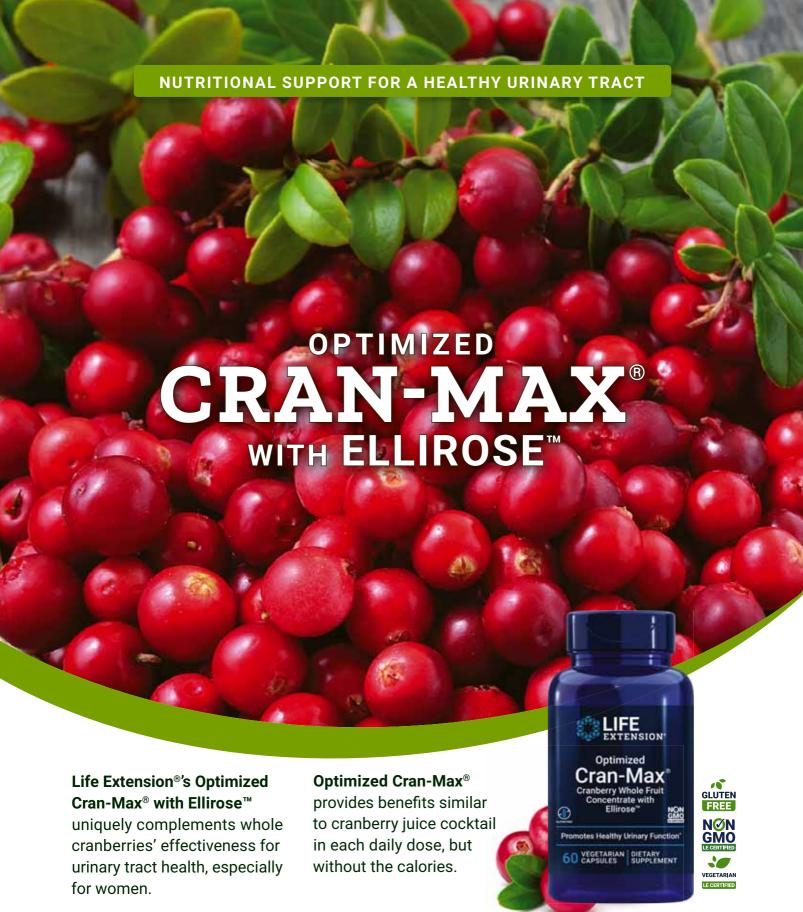
If you have any questions on the scientific content of this article, please call a Life Extension Wellness Specialist at 1-866-864-3027.



Sedell Rand's Centenarian Supplement Regimen

- CoQ10
- Vitamin C
- Vitamin K2
- · Magnesium L-Threonate
- Collagen Peptides
- Vitamin D3
- Multivitamin
- · Nicotinamide riboside
- Carnitine
- B Complex
- Ceramides
- Lactoferrin
- PQQ





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Michael

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Cognitex® Elite Pregnenolone

02396 02397

	01540	DMAE Bitartrate
ACTIVE LIFESTYLE & FITNESS	02006	Dopa-Mind™
01529 Creatine Capsules	02413	Doparime Advantage
02020 Super Carnosine	01658	Ginkgo Biloba Certified Extract™
02023 Tart Cherry with CherryPURE®	01527	Huperzine A
02186 Wellness Bar - Chocolate Brownie	00020	Lecithin
02518 Wellness Bar - Peanut Butter Choo	colate Chip 02101	Memory Protect
02246C Wellness Code® Advanced Whey	00709	Migra-Eeze™
Protein Isolate Vanilla	01602	Neuro-Mag® Magnesium L-Threonate Caps
02221 Wellness Code® Muscle Strength	& Restore Formula	Neuro-Mag® Magnesium L-Threonate Powder
02127 Wellness Code® Plant Protein Con	onplete & 00888	Optimized Ashwagandha
Amino Acid Complex	01676	PS (Phosphatidylserine) Caps
02261C Wellness Code® Whey Protein Cor	ocentrate 02406	Quick Brain Nootropic
Chocolate	01227	Vinpocetine
02260 Wellness Code® Whey Protein Cor	icentrate vanilla	ESTEROL MANAGEMENT
02243C Wellness Code® Whey Protein Isol		
02242 Wellness Code® Whey Protein Isol		Advanced Lipid Control
AMINO ACIDS	01910	CHOL-Support™
00038 Arginine Ornithine Powder	01304	Theaflavins Standardized Extract
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01829 Carnosine	DIGES	STION SUPPORT
01671 D,L-Phenylalanine Capsules	02412	Bloat Relief
01624 L-Arginine Caps	02514	Easy Fiber
01532 L-Carnitine	01736	Effervescent Vitamin C - Magnesium Crystals
00345 L-Glutamine	02021	Enhanced Super Digestive Enzymes
00141 L-Glutamine Powder	02022	Enhanced Super Digestive Enzymes and Probiotics
01678 L-Lysine	02033	EsophaCool™
01827 Taurine	01737	Esophageal Guardian
00133 Taurine Powder	01706	Extraordinary Enzymes
BLOOD PRESSURE & VASCULAR SU	PPORT 02100	Gastro-Ease™
01824 Advanced Olive Leaf Vascular Sup	pport ENER	GY MANAGEMENT
02004 Arterial Protect	01628C	Adrenal Energy Formula • 60 veg capsules
56885 Natto Activ Cardiovascular & Resp		Adrenal Energy Formula • 120 veg capsules
02320 NitroVasc™ Boost	00972	D-Ribose Powder
01953 Pomegranate Complete	01473	D-Ribose Tablets
00956 Pomegranate Fruit Extract	01900	Energy Renew
02024 Triple Action Blood Pressure AM/I	PM 01544	Forskolin
02102 VenoFlow™	01805	Ginseng Energy Boost
BONE HEALTH	01869	Mitochondrial Basics with PQQ
01726 Bone Restore Calcium Supplemen	t 01868	Mitochondrial Energy Optimizer with PQQ
02123 Bone Restore Calcium Supplemen	t Chewable Tablet 01904	NAD ⁺ Cell Regenerator [™] • 100 mg, 30 veg capsules
02416 Bone Restore Elite with Super Pote	ent K2 02344	NAD⁺ Cell Regenerator™ 300 mg, 30 veg capsules
01727 Bone Restore Calcium Supplemen	rt w/ Vitamin K2	NAD⁺ Cell Regenerator™ and Resveratrol Elite™
01725 Bone Strength Collagen Formula	01500	PQQ Caps • 10 mg, 30 vegetarian capsules
01963 Calcium Citrate with Vitamin D	01647	PQQ Caps • 20 mg, 30 vegetarian capsules
01506C Dr. Strum's Intensive Bone Formul	a 00889	Rhodiola Extract
02417 Mega Vitamin K2	02003	Thyroid Support Complex
01476 Strontium Caps	EYE H	IEALTH
BRAIN HEALTH	01923	Astaxanthin with Phospholipids
01524 Acetyl-L-Carnitine	01514	Eye Pressure Support with Mirtogenol®
01974 Acetyl-L-Carnitine Arginate	01992	MacuGuard® Ocular Support with Saffron
02419 B12 Elite	01993	MacuGuard® Ocular Support with
02510 Brain Fog Relief		Saffron & Astaxanthin
01659 CDP Choline	01873	Standardized European Bilberry Extract
02321 Cognitex® Alpha GPC	01918	Tear Support with MaquiBright®

FISH OIL & OMEGAS	HORMONE BALANCE
01937 Mega EPA/DHA	00454 DHEA • 15 mg, 100 capsules
02218 Mega GLA Sesame Lignans	00335 DHEA • 25 mg, 100 capsules
01983 Super Omega-3 EPA/DHA Fish Oil,	00882 DHEA • 50 mg, 60 capsules
Sesame Lignans & Olive Extract • 60 softgels	00607 DHEA • 25 mg, 100 vegetarian dissolve
01988 Super Omega-3 Plus EPA/DHA Fish Oil,	in mouth tablets
Sesame Lignans, Olive Extract, Krill & Astaxanthin	01689 DHEA • 100 mg, 60 veg capsules
01982 Super Omega-3 EPA/DHA Fish Oil,	02368 Optimized Broccoli with Myrosinase
Sesame Lignans & Olive Extract • 120 softgels	00302 Pregnenolone • 50 mg, 100 capsules
01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans	00700 Pregnenolone • 100 mg, 100 capsules
& Olive Extract • 60 enteric coated softgels	01468 Triple Action Cruciferous Vegetable Extract
01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans	01469 Triple Action Cruciferous Vegetable Extract
& Olive Extract • 120 enteric coated softgels	and Resveratrol
01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans	
& Olive Extract • 240 softgels	IMMUNE SUPPORT
01812 Provinal® Purified Omega-7	02302 Bio-Quercetin®
3	02410 Black Elderberry + Vitamin C
	02433 Echinacea Elite
FOOD	01961 Enhanced Zinc Lozenges
02008 California Estate Extra Virgin Olive Oil	02425 Immune Packs with Vitamin C & D,
02170 Rainforest Blend Decaf Ground Coffee	Zinc and Probiotic
02169 Rainforest Blend Ground Coffee	02005 Immune Senescence Protection Formula™
02171 Rainforest Blend Whole Bean Coffee	01681 Lactoferrin (Apolactoferrin) Caps
GLUCOSE MANAGEMENT	02426 Mushroom Immune with Beta Glucans
	01903 NK Cell Activator™
01503 CinSulin® with InSea ^{2®} and Crominex® 3+	01394 Optimized Garlic
01620 CoffeeGenic® Green Coffee Extract	01309 Optimized Quercetin
02122 Glycemic Guard™	01811 Peony Immune
00925 Mega Benfotiamine	01708 Reishi Extract Mushroom Complex
01803 Tri Sugar Shield®	01906 Standardized Cistanche
HEART HEALTH	01097 Ultra Soy Extract
02530 Aged Black Garlic	01561 Zinc Lozenges
01066 Aspirin (Enteric Coated)	
01842 BioActive Folate & Vitamin B12 Caps	INFLAMMATION HEALTH SUPPORT
02121 Homocysteine Resist	01639 5-LOX Inhibitor with AprèsFlex®
02508 Omega-3 Fish Oil Gummy Bites	02324 Advanced Curcumin Elite™
02018 Optimized Carnitine	Turmeric Extract, Ginger & Turmerones
01949 Super-Absorbable CoQ10 Ubiquinone with	01709 Black Cumin Seed Oil
d-Limonene • 50 mg, 60 softgels	02310 Black Cumin Seed Oil and Curcumin Elite™
01951 Super-Absorbable CoQ10 Ubiquinone with	02467 Curcumin Elite™ Turmeric Extract
d-Limonene • 100 mg, 60 softgels	30 veg capsules
01929 Super Ubiquinol CoQ10	02407 Curcumin Elite™ Turmeric Extract
01427 Super Ubiquinol CoQ10 with Enh Mitochondrial	60 veg capsules
Support™ • 50 mg, 30 softgels	01804 Cytokine Suppress® with EGCG
01425 Super Ubiquinol CoQ10 with Enh Mitochondrial	02223 Pro-Resolving Mediators
Support™ • 50 mg, 100 softgels	56886 Restore Activ Joint Muscle & Tissue
01437 Super Ubiquinol CoQ10 with Enh Mitochondrial	01203 Specially-Coated Bromelain
Support™ • 100 mg, 30 softgels	00407 Super Bio-Curcumin® Turmeric Extract
	JOINT SUPPORT
01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels	
01431 Super Ubiquinol CoQ10 with Enh Mitochondrial	& AprèsFlex®
Support™ • 200 mg, 30 softgels	00965 Fast-Acting Joint Formula
01733 Super Ubiquinol CoQ10 with PQQ	02430 Fast Acting Relief
01859 TMG Liquid Capsules	00522 Glucosamine/Chondroitin Capsules
00349 TMG Powder	02420 Glucosamine Sulfate
	02424 Joint Mobility
	01600 Krill Healthy Joint Formula
	02529 Lower Back Relief
	02529 Lower Back Relief 00451 MSM (Methylsulfonylmethane)
	02529 Lower Back Relief

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01790 PalmettoGuard® Saw Palmetto/Nettle Root

Formula and Beta-Sitosterol

01373 Prelox® Enhanced Sex for Men

01940 Super MiraForte with Standardized Lignans

02500 Testosterone Elite

01909 Triple Strength ProstaPollen™

02029 Ultra Prostate Formula

PERSONAL CARE

02322 Hair, Skin & Nails Collagen Plus Formula

01278 Life Extension Toothpaste

00408 Venotone

02252 Youthful Legs

PET CARE		VITAMINS	
01932	Cat Mix	01533	Ascorbyl Palmitate
01931	Dog Mix	00920	Benfotiamine with Thiamine
02523	DOG Hip & Joints	01945	BioActive Complete B-Complex
02524	DOG Multivitamin & Probiotics	00102	Biotin
02522	DOG Skin & Coat	00084	Buffered Vitamin C Powder
02525	DOG Stress & Behavior	02229	Fast-C® and Bio-Quercetin®
PROB	BIOTICS	02075	Gamma E Mixed Tocopherol Enhanced with
01622	Bifido GI Balance	00070	Sesame Lignans
01825	FLORASSIST® Balance	02070	Gamma E Mixed Tocopherol & Tocotrienols
02421	FLORASSIST® Daily Bowel Regularity	01913	High Potency Optimized Folate
02125	FLORASSIST® GI with Phage Technology	01674	Inositol Caps
01821	FLORASSIST® Heart Health	02244	Liquid Vitamin D3 • 50 mcg (2000 IU)
02250	FLORASSIST® Mood Improve	02232 01936	Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU) Low-Dose Vitamin K2
02208	FLORASSIST® Immune & Nasal Defense	00373	No Flush Niacin
02120	FLORASSIST® Oral Hygiene	01939	Optimized Folate (L-Methylfolate)
02203	FLORASSIST® Prebiotic	01939	Pyridoxal 5'-Phosphate Caps
02505	FLORASSIST® Probiotic Women's Health	01400	Super Absorbable Tocotrienols
SKIN	CARE	02334	Super K
02423	Daily Skin Defense	01863	Super Vitamin E
01938	Shade Factor™	02422	Vegan Vitamin D3
02129	Skin Care Collection Anti-Aging Serum	02028	Vitamin B5 (Pantothenic Acid)
02130	Skin Care Collection Day Cream	01535	Vitamin B6
02131	Skin Care Collection Night Cream	00361	Vitamin B12 Methylcobalamin
02096	Skin Restoring Ceramides	01536	Vitamin B12 Methylcobalamin
02528	Vegan Pro Collagen		1 mg, 60 veg lozenges
	-	01537	Vitamin B12 Methylcobalamin
SLEE			5 mg, 60 veg lozenges
01512	Bioactive Milk Peptides	02228	Vitamin C and Bio-Quercetin®
02300	Circadian Sleep		60 veg tablets
01511	Enhanced Sleep without Melatonin	02227	Vitamin C and Bio-Quercetin®
02234	Fast-Acting Liquid Melatonin		250 veg tablets
01669	Glycine	01753	Vitamin D3 • 25 mcg (1000 IU), 90 softgels
02308 01722	Herbal Sleep PM	01751	Vitamin D3 • 25 mcg (1000 IU), 250 softgels
01/22	L-Tryptophan Melatonin • 300 mcg, 100 veg capsules	01713	Vitamin D3 • 125 mcg (5000 IU), 60 softgels
01083	Melatonin • 500 mcg, 100 veg capsules	01718	Vitamin D3 • 175 mcg (7000 IU), 60 softgels
00329	Melatonin • 1 mg, 60 capsules	01758	Vitamin D3 with Sea-Iodine™
00329	Melatonin • 3 mg, 60 veg capsules	02040	Vitamins D and K with Sea-Iodine™
00331	Melatonin • 10 mg, 60 veg capsules	WEIG	HT MANAGEMENT & BODY COMPOSITION
00332	Melatonin • 3 mg, 60 veg lozenges	02479	7-Keto® DHEA Metabolite
02201	Melatonin IR/XR		100 mg, 60 veg capsules
01787	Melatonin 6 Hour Timed Release	02207	AMPK Metabolic Activator
	300 mcg, 100 veg tablets	02504	Body Trim and Appetite Control
01788	Melatonin 6 Hour Timed Release	02478	DHEA Complete
	750 mcg, 60 veg tablets	01432	Optimized Saffron
01786	Melatonin 6 Hour Timed Release	02511	Thermo Weight Control
	3 mg, 60 veg tabs	02509	Waistline Control™
01721	Optimized Tryptophan Plus	WOM	EN'S HEALTH
01445	Quiet Sleep Melatonin • 5 mg, 60 veg capsules	01942	Breast Health Formula
02502	Rest & Renew	01894	Estrogen for Women
02526	Serene Sleep	02204	Menopause Relief
		02319	Prenatal Advantage
		01649	Soy Isoflavones

02513 Women's Bladder Support



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Rusty

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NEURO-MAG®

THE SMART MAGNESIUM



SUPPORTS OVERALL COGNITIVE ABILITY

Neuro-Mag® Magnesium L-Threonate helps maintain working (short-term) memory, encourages healthy processing speed, and supports overall cognitive function.¹⁻³



Item #01603 • 90 vegetarian capsules

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1 jar **\$30.75** • 4 jars \$27.50 each

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

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IN THIS EDITION OF LIFE EXTENSION MAGAZINE®





7 WHY ARTERIES STIFFEN WITH AGE

With age, arteries lose **elasticity**, contributing to **cardiovascular** disorders.

24 FIGHT FATIGUE WITH VITAMIN D

A **human** study found **72**% of adults with <u>low</u> **vitamin D** blood levels *and* **fatigue** reported *improvement* with supplemental vitamin D.





34 NITRIC OXIDE AND ARTERIAL HEALTH

In two clinical trials, a novel arginine compound *increased* **flow-mediated dilation** and a marker of **nitric oxide** synthesis.



High **cortisol levels** increase mortality risk from **cardiovascular** disease. Several **plant extracts** *reduce* elevated cortisol in clinical studies



Gout, kidney stones, and kidney disorders can be caused by excess **uric acid**. In clinical trials, a plant extract *reduced* uric acid levels by **28.4%** <u>and</u> *improved* markers of **kidney function**.



Resveratrol has been shown in clinical studies to improve biomarkers of health. It may help promote **healthy aging**.



