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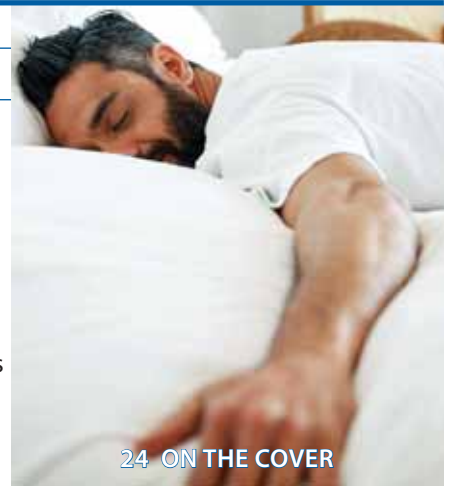
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* *Br J Pharmacol.* 2004 Mar;141(5):825-30.

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BY WILLIAM FALOON

Add 12 to 14 Years to Healthy Life Expectancy

When I founded the **Life Extension**® group in 1977, our unique purposes attracted a lot of media attention.

A question reporters often asked me was:

“Why do you want to live so long?”

Rather than respond to the obvious, I made it clear that if people followed healthier lifestyles, they could add about **15 years** to their lifespans.

Despite the news coverage, public interest in our work was virtually **zero** until **1980**. That’s when we began publishing **Anti-Aging News**. Three hundred subscriptions were sold the first year at \$27 each.

This attracted media questions like: *“Is extending human lifespans a fad that will soon disappear?”* Our response was that once people feel better and live longer, they will not revert to illness and premature death.

A large study published in **2018** demonstrated that people who adopt five specific **healthy lifestyle** factors add **12-14 years** to their life expectancy.¹

None of these healthy choices are surprising today. Each, however, was met with skepticism in earlier years.

We at **Life Extension** view **15 years** of added life as a starting point. Those who go beyond basic preventive practices may live significantly longer.

The **2018** paper, published in a prestigious medical journal, outlines five factors associated with **12-14 years** of additional life expectancy at age 50.¹ Readers of this magazine engage in far more comprehensive approaches.

These findings, however, serve as a reminder to not overlook the basics of **healthy longevity**.



AS WE SEE IT

Despite spending more on medical care, Americans have a shorter lifespan compared with most other affluent countries.^{2,3}

These *higher* rates of mortality in the United States prompted a study to estimate the impact of **lifestyle factors** on life expectancy.¹

The 5 Critical Lifestyle Factors

The healthy lifestyle factors associated with *longer* life expectancy in this study were:¹

- A healthy diet
- Maintaining a body mass index of **18.5** to **24.9 kg/m²**
- 30 minutes or more a day of moderate/vigorous physical activity
- Light alcohol intake
- Never smoking

Huge Amounts of Data Analyzed

In this **2018** study, data from the following sources were analyzed:¹

- Nurses' Health Study (1980–2014)
- Health Professionals Follow-up Study (1986–2014)

Combining these two studies allowed the researchers to combine results from more than **123,000** participants and to include up to 34 years of follow-up monitoring.

The title of the paper perfectly reflects the purpose of the study:

"Impact of Healthy Lifestyle Factors on Life Expectancies in the U.S. Population."¹



On the basis of these findings, the researchers wrote that:

"Americans could narrow the life-expectancy gap between the United States and other industrialized countries by adopting a healthier lifestyle."¹

Impact on Longevity

Circulation is a scientific journal published for the **American Heart Association**.

This 2018 study published in ***Circulation***, incorporated data from more than 123,000 individuals for up to **34** years.

Five lifestyle factors made a huge impact on mortality.

People who adhered to all five of these behaviors had a **74%** lower risk of dying from any cause, compared to those who didn't follow *any* of the health lifestyle measures.¹

In people who failed to adhere to any of the five healthy factors, cancer deaths were **65%** higher and cardiovascular disease mortality was **82%** higher.¹

There was a clear trend for lower risk of dying with increasing adherence to the **healthy lifestyle factors**, even if the participants didn't adhere to all five.

In other words, adhering to *any or all* of the healthy lifestyle factors progressively decreased risk of dying compared with adhering to no healthy lifestyle factors.

The researchers projected that 50-year-old **women** who followed all five healthy lifestyle factors would live an additional 14 years beyond what would be expected for someone who didn't adhere to any of the lifestyle measures, while 50-year-old **men** who followed all five healthy lifestyle factors would live **12.2 years** longer.¹

These **12 to 14 added** years represent a **48% to 49%** increased lifespan (starting at age 50) in the **healthy lifestyle** individuals, compared to those who did not follow any of the five longevity factors.¹

Real World Benefits

Findings from this **2018** study are consistent with those from other countries, such as Japan,⁴ Germany,^{5,6} and Canada.⁷

This suggests that adherence to a **healthier lifestyle** exerts robust and durable effects across a wide range of geopolitical and cultural backdrops.

The authors of this study commented that “**the United States healthcare system has focused primarily on drug discoveries and disease treatment rather than prevention.**”¹

Vindication for Health-Conscious Individuals

These life-expectancy gains reported in the **2018** study are not

surprising with today’s understanding of disease risks.

To repeat a point that bears emphasizing, people who adhered to all five healthy lifestyle factors had a **74% lower** risk of dying from *any* cause at any time during the follow-up period than people who did not adhere to any healthy lifestyle factors.¹

For those who long ago began engaging in a healthy lifestyle and were criticized by cynics who felt little could be done to influence longevity, this large data analysis represents meaningful **vindication**.

No Comparison to Life Extension Supporters

The majority of people who enjoyed these remarkable lifespan increases did nothing exceptional.

Unlike most of you reading this now, the study subjects didn’t take full advantage of longevity insights offered by **comprehensive blood testing**.

The study subjects contrast sharply with *Life Extension* readers

who intervene to slow aging by correcting **NAD+** deficits, removing **senescent cells**, and boosting cellular **AMPK** activity.

This large study, however, provides compelling evidence that Americans exert a tremendous degree of control over their healthy longevity. It also reveals why **preventive healthcare** should be a top priority for health policymakers.

Sadly, American medical practice is dominated by pharmaceutical and other financial interests whose profit depends on treating lots of people who contract cancer, or have blocked arteries, dementia, etc.

Circumventing Degenerative Illnesses

In 2018 it is estimated that over **600,000** Americans died of **cancer**.⁸

Heart disease mortality has declined, but still surpasses cancer.

Record numbers of Americans are stricken with **Alzheimer’s** today, though prevalence of **dementia** has dropped in people who follow preventive behavior patterns.⁹



AS WE SEE IT

An abundance of published research validates substantial decreases in disease incidence and mortality in people who proactively take steps to protect their precious health.

In This Month's Issue...

As men age past 40, they encounter nighttime **urinary urgencies** related to **overactive bladder**. Page 24 of this issue discusses a **plant extract** formula that reduced nighttime **urinary frequency** in a study group of **men** over age 45.

On page 42 we examine a primary **inflammatory** factor inside cells that can be easily suppressed. Most of you have garnered these **inflammation-lowering** benefits since the early **1990s**.

As a reader of this publication, you are kept informed on the latest scientific findings about improving **quality-of-life** as you add more years to your healthy longevity.

For longer life,



William Faloon, Co-Founder
Life Extension Buyers Club

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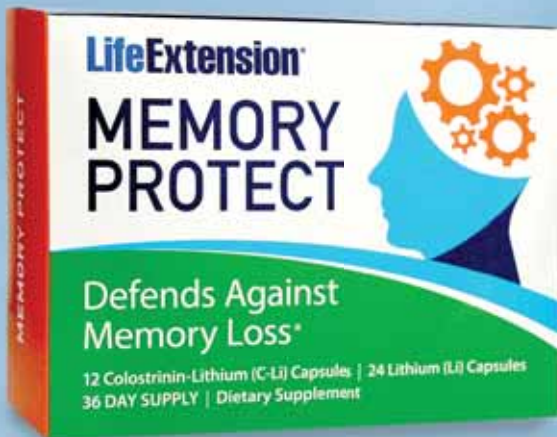
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Curcumin Enhances the Cardioprotective Effect of Metformin

A study published in *Biomedicine & Pharmacotherapy* showed that **curcumin** can enhance the cardioprotective effect of **metformin** in rats with type I diabetes.*

For the study, diabetic rats received either **200 mg/day** of metformin, **100 mg/day** of curcumin, or a combination of both.

Prior to treatment, the animals developed *cardiomyopathy*, a disease of the heart muscle that makes it difficult to pump blood. Diabetic cardiomyopathy is a major complication for patients with both type I and type II diabetes and can lead to heart failure and death.

Six weeks of treatment with metformin alone restored most of the measured parameters. However, the addition of curcumin enhanced metformin's cardioprotective effect.

The combination resulted in a marked reduction in markers of cardiac injury and inflammation, while improving the damaged heart tissue.

Editor's Note: "These findings suggest that a metformin and curcumin combination is a potential therapeutic candidate for diabetic cardiomyopathy in type I diabetes mellitus," the authors concluded.

* *Biomed Pharmacother.* 2019 Jan;109:2136-2144.

Vitamin D Can Prevent COPD Patients from Getting Worse

According to a study published in the journal *Thorax*, vitamin D supplementation can help patients with chronic obstructive pulmonary disease (COPD).*

In a meta-analysis of three randomized, controlled trials which took place in the UK, Belgium, and the Netherlands, researchers identified data from 469 subjects.

The authors of the study found that patients with deficient vitamin D levels, lower than **10 ng/mL**, who received supplementation, were far less likely to experience worsening symptoms and lung attacks. Participants who already had higher levels of vitamin D did not receive more protection when given additional supplementation.

Editor's Note: Lead researcher Dr. Adrian Martineau, Clinical Professor of Respiratory Infection and Immunity at Queen Mary University of London, asserted that, "Our study shows that giving supplements to vitamin D-deficient COPD patients **nearly halves** their rate of potentially fatal attacks."

* *Thorax*. 2019 Apr;74(4):337-345.

French Oak Wood Extract Eases PTSD

A decrease in symptoms of post-traumatic-stress disorder (PTSD) was found among patients who supplemented with French oak wood extract for four weeks, according to a study reported in *Minerva Medica*.*

The study included 15 men and 19 women between the ages of 25 and 52, who were receiving supportive psychotherapy for PTSD. Sixteen participants also received **300 mg** of French oak wood extract daily for four weeks. PTSD symptoms and oxidative stress levels were assessed at the beginning and end of the study.

At the end of the treatment period, the percentages of participants with PTSD symptoms were all significantly lower among those treated with French oak wood extract compared to standard management alone. At the end of the study French oak wood extract supplementation was also associated with reductions in sleep difficulties, fatigue, irritability, and oxidative stress in comparison with standard management alone.

Editor's Note: PTSD is a condition associated with recurrent, obsessive recollection of severe traumatic events and can involve episodes of rapid heartbeat, perspiration, and variation in blood pressure. Psychotherapy, exposure therapy, and drugs like selective serotonin reuptake inhibitors (SSRIs) are currently employed to treat the condition.

* *Minerva Med.* 2018 Oct;109(5):363-368

Antioxidants Protect Against Hypoglycemia's Damage

Episodes of hypoglycemia (low blood glucose) are common occurrences among diabetics treated with insulin. Repeated episodes are associated with cognitive impairment, which can worsen over time. Research presented at the Society for Endocrinology's annual conference suggests a protective effect conferred by antioxidants against damage to the brain caused by low glucose.*

In the study, insulin was used in a mouse model of type I diabetes to induce low glucose levels three times weekly for four weeks. One group of mice received **sulforaphane**, an antioxidant found in broccoli and other vegetables, 24 hours before each low blood glucose episode.

Treatment with sulforaphane resulted in lower levels of **hemoglobin A1c**, a marker of long-term glucose control. Animals that received the compound experienced an increase in antioxidant markers, a decrease in free radical damage, and better memory, compared to those that were not treated with sulforaphane.

Editor's Note: "The concentration of sulforaphane used in this study would not be attainable in a normal diet rich in vegetables," commented researcher Dr. Alison McNeilly. "However, there are numerous, highly potent compounds in clinical trials which may prevent cognitive impairments caused by free radicals, to help diabetes patients."

* 2018 Nov 19-21. Society for Endocrinology BES annual conference.



Blueberries Can Help Lower Blood Pressure

Researchers have discovered that anthocyanins, a type of compound found in blueberries, can improve endothelial function, resulting in lower blood pressure, reported *The Journals of Gerontology: Series A*.*

The study was conducted by lead researcher Dr. Ana Rodriguez-Mateos and colleagues at King's College London. She noted that, "If the changes we saw in blood pressure function after eating blueberries every day could be sustained for a person's whole life, it could reduce their risk of developing cardiovascular disease by up to **20%**."

Participants in the study were 40 healthy volunteers who were given either a drink containing **200 grams** of blueberries daily or a matched control. The people were monitored for the effects on chemicals in blood and urine, as well as on blood pressure.

The findings showed that the beneficial effects of the blueberries on blood vessel function could be seen two hours later and were sustained for 30 days. During the monthlong duration of the study, in those participants who ingested the blueberries, systolic blood pressure was reduced by **5 mmHg**.

Editor's Note: The authors concluded that, "Daily one-month blueberry consumption increased flow-mediated dilation and lowered 24-hour ambulatory systolic blood pressure."

* *J Gerontol A Biol Sci Med Sci*. 2019 Feb 16.

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Reducing Nighttime URINARY FREQUENCY in Men

BY STEPHEN HARRINGTON

Waking up multiple times during the night to urinate is more than an inconvenience.

It's one of the most common lower **urinary tract** symptoms in older men.

The medical term for this is **nocturia**.

It disrupts sleep patterns, which can lead to a host of health problems, and it's a frequent cause of falls and resulting fractures.^{1,2}

Current medical therapies offer limited improvements.³

A recently conducted pilot trial evaluated the effect of four **nutrient** compounds plus **melatonin** on mild, lower urinary tract symptoms, especially **nocturia** in healthy, older men.⁴

The primary study outcome was a decrease in nighttime urination.⁴

By the end of the study, the number of people suffering from nocturia *at all* was reduced by **64%**. And not a single participant was left waking up *more* than one time a night.⁴

This finding can potentially help millions of men who suffer from an **overactive bladder** to improve their sleep health, while reducing risk for falls and injuries.

A Common Aging Problem

The male urinary tract is prone to problems that worsen with age.

Lower urinary tract symptoms (LUTS) are a broad spectrum of clinical manifestations related to the bladder, urethra, and prostate gland. **LUTS** affect as many as **70%** of men over 80 years of age.⁵

Besides nocturia, these symptoms can include increased urinary frequency, urgency, incontinence, incomplete bladder emptying, hesitancy, prolonged micturition, dribbling and a weak urine stream.⁶

The worsening of **LUTS** as men get older is due to various factors that cause dysfunction of the urinary system.⁷ An overactive bladder, enlargement of the prostate gland, and damage to the urethra can all contribute to urinary symptoms.

Compounds that incite **chronic inflammation** in the urinary tract can contribute to the development of LUTS and prostate enlargement.^{8,9} Men with LUTS have increased levels of plasma pro-inflammatory biomarkers.⁸

The **aging** process increases the risk for all of these problems. Obesity, diabetes, high blood pressure, smoking, some medications, nervous system disorders, and others can also contribute to LUTS.¹⁰

The Dangers of Nocturia

The most common **LUTS**, and the one which can lead to the most serious problems, is **nocturia**, the need to get up to urinate during the night, often more than once.^{1,2}

Nocturia can occur in at least **half** of all men over 50 years of age.¹¹ **Clinically relevant nocturia**, defined as having to get up to urinate *two or more times* each night, increases significantly with advancing age, affecting as many as **62%** of those aged 70-80.¹

Aside from being annoying, nocturia is also a serious health condition that should not be trivialized. Nighttime urinary frequency has the greatest impact of any of the LUTS on quality of life.^{1,2,11,12}

By disturbing sleep, nocturia can contribute to poor health, lower energy, depression, and increased **overall mortality**.^{1,13-16}

Frequent nocturia can result in falls. Particularly in older individuals who may suffer from frailty, poor balance, and bad vision, navigating the way to the bathroom multiple times in the middle of the night can be treacherous.



Remedies for Nocturia

Most pharmaceutical approaches to treating LUTS focus on controlling bladder overactivity and obstruction of urine flow. These drugs are far more effective in treating the *daytime* symptoms of LUTS, but have little impact on nocturia.¹⁷

But research has shown that several compounds have beneficial effects on the aging urinary system and can potentially reduce nocturia. A study showed that the following five compounds work together to maximize the relief from nighttime urinary problems.

BETA-SITOSTEROL

Beta-sitosterol is a plant sterol isolated from the oils of certain vegetables and nuts. A study in an animal model established this compound is an *inhibitor* of an enzyme in the prostate gland, called **5 α -reductase**, which converts testosterone to dihydrotestosterone.¹⁸

By *reducing* the levels of dihydrotestosterone, beta-sitosterol helps *reduce* age-related prostate enlargement. When the prostate is enlarged, it blocks the flow of urine through the urethra. This contributes to nocturia and other LUTS. *Reducing* prostate enlargement supports *healthy* urine flow.¹⁹⁻²²

Clinical studies in men with prostate enlargement show beta-sitosterol improves urinary symptoms. In a randomized, double-blind, placebo-controlled study, scoring of LUTS severity was reduced by **50%** and measures of quality of life improved by **42%**.²⁰

Experimental evidence also points to anti-inflammatory activities of beta-sitosterol.²³⁻²⁵

PYGEUM BARK EXTRACT

Pygeum africanum is the scientific name for the African cherry tree. The bark of this tree has been used in Africa to improve urinary symptoms and bladder discomfort for centuries. Modern science has revealed that this extract works through several mechanisms. In addition to anti-inflammatory effects, it helps control bladder overactivity and reduces prostate enlargement.^{26,27}

Clinical trials of **pygeum bark extract** have shown a reduction in frequency of nighttime urination. Two meta-analyses of existing studies found an average **19%** reduction in nocturia,^{26,27} and one trial found as much as a **32%** reduction in the frequency of nocturnal urination.²⁸

It also has anti-inflammatory properties relevant to prostate enlargement and LUTS.²⁹



Nocturia

- **Lower urinary tract symptoms (LUTS)** is a constellation of symptoms that affect urinary function in men, caused in part by an overactive bladder, enlargement of the prostate gland, and/or injury to the urethra.
- With advancing age, LUTS is increasingly common, affecting up to **70%** of all men over 80 years of age.
- The most common symptom of LUTS is **nocturia**, the need to wake one or more times during the night to urinate.
- Untreated nocturia is associated with risk for falls and related injuries, poor sleep, and diminishing physical and mental health.
- Five compounds—**beta-sitosterol, pygeum bark extract, lycopene, boron, and melatonin**—have been shown to *reduce* LUTS and nighttime urination frequency.
- A pilot clinical trial of these ingredients showed a significant reduction in nocturia in older men suffering from mild LUTS.



LYCOPENE

Found in tomatoes and some other red or pink fruits and vegetables, **lycopene** is a carotenoid pigment with anti-inflammatory properties.³⁰ Lycopene naturally tends to concentrate in the prostate gland,³¹ making it ideal for reducing the inflammation that can contribute to frequent nighttime urination.³²

Like beta-sitosterol, lycopene also has the ability to reduce the production of dihydrotestosterone in the prostate, removing one of the major drivers of prostate enlargement.^{33,34}

Lycopene has **anti-proliferative** properties, which means it helps prevent the abnormal growth of cells. In studies of prostate cells, lycopene blocks cell division, which may help prevent enlargement.³⁵

Lycopene was shown to inhibit pro-inflammatory cytokines such as IL-6 and IL-8, further supporting benefits on LUTS.^{32,36}

BORON

In further support of inflammation management relevant to LUTS, the mineral **boron** has been shown to *reduce* several markers of inflammation, such as **TNF- α** , **IL-6**, and **C-reactive protein**.³⁷

Boron has effects on other signaling compounds in the body that are associated with development of LUTS and nocturia. It modulates sex hormone function and ameliorates the impact of growth factors, such as **IGF-1**, which may contribute to prostate enlargement.^{37,38}

MELATONIN

Melatonin is a hormone produced by the pineal gland that is involved in the regulation of sleep-wake cycles. Supplemental melatonin can help induce better sleep.

But beyond sleep support, melatonin has been shown to be helpful in treating nocturia. A randomized controlled trial published in the *Journal of Urology* evaluated its use in men suffering from significant nocturia, waking on average *three times* each night to urinate.³⁹ In these men, **2 mg** of melatonin before bed was superior to a placebo in reducing the frequency of nocturia.

Another human study of melatonin found similar effects. Men receiving the same dose of melatonin reduced the frequency of nighttime urination from an average of **3.4** times per night to **2.6** times per night.⁴⁰

Successful Pilot Human Trial

A pilot trial studied a group of men with mild nighttime (LUTS) urinary issues to analyze the effects of a formula containing:

- Beta-sitosterol **180 mg**
- Pygeum extract (bark) **100 mg**
- Lycopene [Lycobeads® from **15 mg** natural tomato extract (fruit)]
- Boron (as Albion® bororganic glycine) **10 mg**
- Melatonin **2 mg**

Healthy men with mild LUTS, aged 45 to 72 years, were recruited for the trial.⁴ Baseline urinary symptoms including the frequency of nocturia were assessed before treatment began. Subjects were then instructed to take one capsule of the bladder control supplement formula daily, just before bedtime. At the end of the 60-day trial period, urinary symptoms were again evaluated.

At the start of the trial, **87%** of men reported some degree of nighttime urination. This included roughly **50%** of men who had to get up one time at night, and **37%** who reported waking two to three times each night to urinate at the beginning of the study.

At the end of the 60 days, the researchers observed a remarkable improvement in nighttime urination frequency. Those suffering from nocturia declined from **87%** at the start of the trial to only **23%** by the trial conclusion—a **64%** reduction!

Particularly notable was the reduction in the most severe cases of nocturia. While **37%** of the men originally complained of waking two or more times each night to urinate, **none** suffered from this degree of nocturia at the end of the study. The **23%** who continued to report nocturia by the study's end were all a *single* awakening per night.

This means that those who suffered the most extreme nocturia, and were at highest risk for falls, loss of sleep, and diminished quality of life, *all* had a

significant positive impact on their symptoms. Some of these men went from two or three nightly wakings to none—a major impact for those at greatest risk.

Summary

Lower urinary tract symptoms (LUTS) are very common in men as they get older. The most prevalent and potentially dangerous of these symptoms is **nocturia**, the need to get up one or more times during the night to urinate.

Conventional medical treatments for urinary disorders mostly address daytime symptoms. They do relatively little to remedy nocturia, which can increase risk of falls and related injuries, and can lead to diminishing physical and mental health and increased rate of mortality.

In a pilot clinical study, five compounds that included beta-sitosterol, pygeum bark extract, lycopene, boron, and melatonin were shown to improve LUTS, and *reduce* the frequency of nighttime urination in men.

These findings can potentially improve quality-of-life in men who suffer urinary symptoms. ●

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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Protect Against Damage Caused by Excess Weight

BY KAREN JAFFE

Carnosine is showing promise in *preventing* the initial stages of **atherosclerosis**, an occlusive arterial disorder that worsens as people age.

Despite reduced prevalence of **coronary artery** blockage and ischemic **stroke** in middle aged adults, these vascular disorders remain leading causes of disability and death.

When atherosclerosis-prone mice were supplemented with **carnosine**, there was reduced formation of **atherosclerotic plaque** in their **aortic valves** and reduced accumulation of aldehyde complexes.¹

Aortic stenosis is especially prevalent in people over age 70 and is a causative factor in chronic **heart failure**.

Studies show that **carnosine** (a combination of two amino acids) can help protect aging arteries against the harmful effects of excess **body fat**.

Red meat is the primary source of carnosine in the diet. Yet even meat eaters obtain only temporary carnosine blood levels. As people switch to healthier **plant-based** diets, they may be getting no protective carnosine.

Two Forms of Body Fat: White Fat and Brown Fat

All body fat isn't the same.

White fat is what we usually associate with overweight people. It predominates in adults, stores calories, tends to accumulate where we least want it (especially around the belly), and results in damaging **inflammation**.

But **brown fat** is a completely different kind of fat. It is abundant in infants and hibernating animals. It **burns calories** and *releases* that energy as heat.^{2,4}

That heat benefits babies, and it's good for bears in cold environments. In adult humans, that heat represents a desirable "burning" of energy that may reduce the amount of overall fat in the body.^{3,5}

Promoting conversion of white to brown fat may help **reduce obesity** and the *inflammation* and other risks that come with it.^{2,4}

Carnosine Reduces Weight Gain

In a study published in **2018**, scientists studied **carnosine** in the muscles and brain of animals to determine its **fat-browning** properties.²

In this study, rats were fed regular and high-fat diets. For six weeks the rats were either supplemented with carnosine, or not.

Researchers observed the impact of carnosine on the animals' body weight and markers of oxidative stress.² This is a way to study some of the factors that contribute to arterial damage that sets the stage for future heart attacks and ischemic strokes.

What they found was that either **carnosine** alone, or exercise, significantly **reduced body weight**

gain, ameliorated obesity-induced lipid abnormalities, and blunted the rise of chemically-stressed fat molecules and their inflammatory byproducts.²

Underlying these changes, researchers saw an increase in the calories burned and a reduction of the overall fat load.

Not surprisingly, the greatest benefit was seen in the rats that were supplemented with carnosine *and* subjected to daily exercise, suggesting a synergistic effect.

The bottom line is that carnosine, alone *or* in combination with exercise, may reduce body weight gain *and* white fat stores by *increasing* the amount of brown fat in the body. That, in turn, may drive down the risk for cardiovascular disease and other complications of obesity.

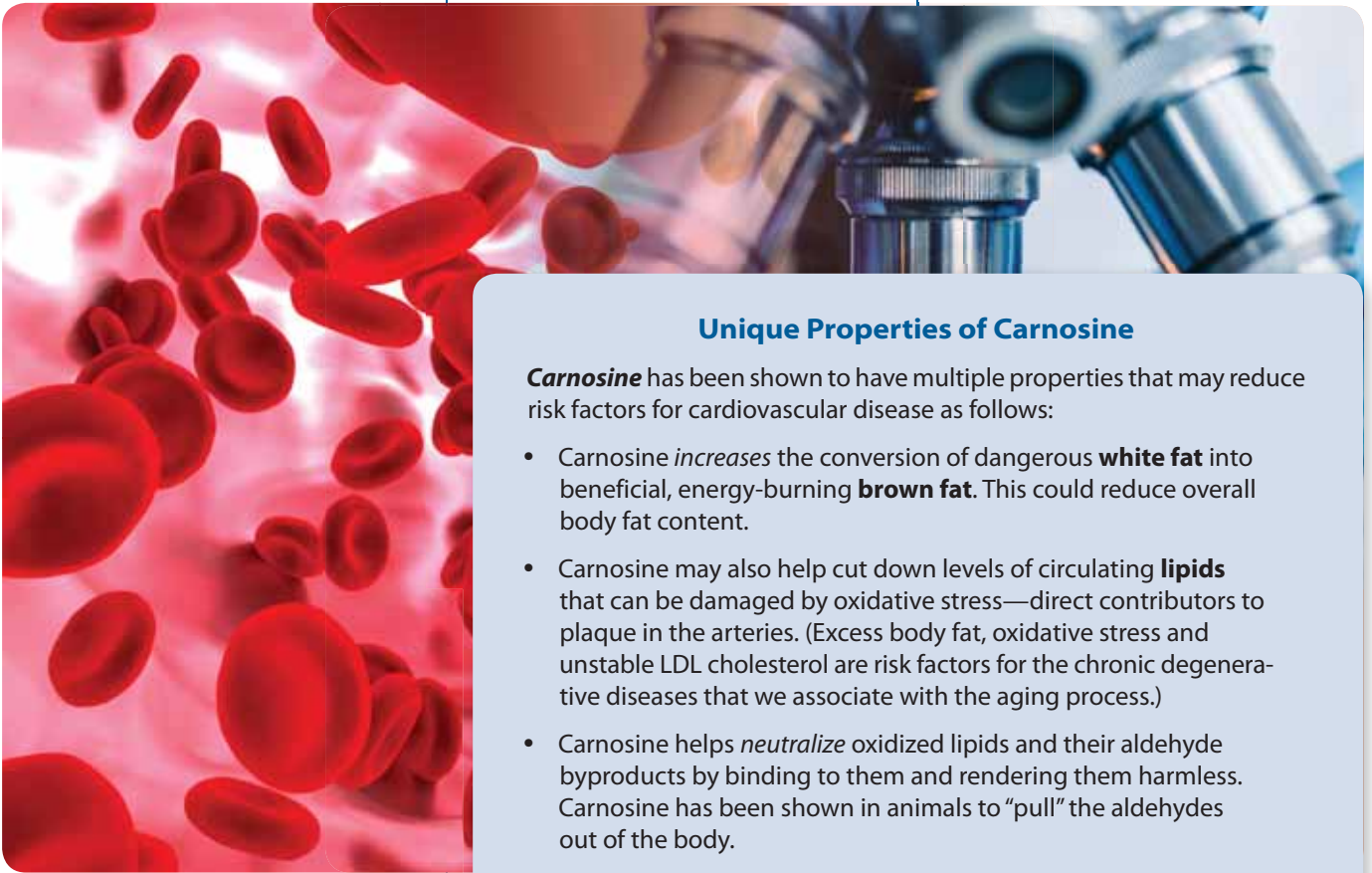
Protecting Against Dangerous Aldehydes

Carnosine is being studied by researchers looking for ways to protect against the damaging effects of **oxidized** fats in the body and lipoproteins (like **LDL**) in the blood.^{6,7}

Aldehydes are toxic chemicals created when oxidative compounds damage lipids and protein structures in our body. These aldehydes inflict damage on arteries and structures in the heart (including muscle, valves and coronary arteries).^{8,9}

Carnosine seems custom-made to protect against this dangerous onslaught. It can neutralize and protect against oxidized lipids and aldehydes. One group of researchers found that carnosine *inhibited*





Unique Properties of Carnosine

Carnosine has been shown to have multiple properties that may reduce risk factors for cardiovascular disease as follows:

- Carnosine *increases* the conversion of dangerous **white fat** into beneficial, energy-burning **brown fat**. This could reduce overall body fat content.
- Carnosine may also help cut down levels of circulating **lipids** that can be damaged by oxidative stress—direct contributors to plaque in the arteries. (Excess body fat, oxidative stress and unstable LDL cholesterol are risk factors for the chronic degenerative diseases that we associate with the aging process.)
- Carnosine helps *neutralize* oxidized lipids and their aldehyde byproducts by binding to them and rendering them harmless. Carnosine has been shown in animals to “pull” the aldehydes out of the body.

These findings represent advances in our understanding of vascular and muscle damage that occurs with aging.

formation of two highly damaging aldehydes, 4-HNE (4-hydroxynonenal) and MDA (malondialdehyde).^{1,9,10}

In animals, the study found that supplementing atherosclerosis-prone mice with carnosine significantly **reduced formation of atherosclerotic plaque** in their aortic valves and reduced accumulation of dangerous aldehyde complexes. What’s more, carnosine was found to tightly bind to the aldehydes and carry them out of the body in the mice’s urine.¹

Another study confirmed carnosine’s ability to neutralize **aldehydes**. Researchers pretreated heart muscle cells with carnosine and then exposed them to aldehydes like 4-HNE. Cells treated with carnosine **lived longer** than the cells that didn’t receive carnosine treatment.¹¹

Challenge in Achieving Sustained Carnosine Blood Levels

The primary **dietary source** of carnosine is **red meat**, which many health-conscious people are seeking to reduce or eliminate from their diets.

Excess consumption of red meat increases the risk of heart disease, certain cancers, and other disorders. As a result, health-conscious people are eating more fruit, vegetables, and fish, and are staying away from beef.

A fascinating study of 18 people sought to determine carnosine concentrations in blood plasma after eating beef.¹²

Each **7.1-ounce** serving of **ground beef** in this study contained **248 mg** of **carnosine**.

In the study’s first phase, meat foods were removed from the diet for 48 hours. When fasting blood levels were measured, **no** carnosine was present.

After the subjects ate 7.1 ounces of ground beef, **carnosine** was detected in the blood within 15 minutes and continued to increase for several hours. After 5.5 hours, however, there was again **no** carnosine in the blood. This study showed that **248 mg** of dietary carnosine does not provide the body with all-day benefits.

The reason carnosine disappears so quickly from the blood is the presence of an *enzyme* (carnosinase) that degrades carnosine in the body. This study on carnosine **blood levels** after **ground beef** ingestion confirms earlier recommendations that people supplement with *higher* doses of carnosine.¹³ Most people today supplement with **500 mg** of carnosine once or twice daily

Summary

Carnosine shows promise in combatting the damage that can cause arterial blockage, aortic valve stenosis, and unwanted weight gain.

Dietary sources of carnosine do not provide sustainable blood levels. As people switch to healthier plant-based diets, they may have zero levels of carnosine in their blood.

Carnosine was at one time an expensive dietary supplement. Improvements made nearly 20 years ago enable most people to obtain potent carnosine doses at affordable costs. ●

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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1 bottle \$51

4 bottles \$45 each

Each formula provides high doses of **carnosine** to ensure **sustained** benefits.

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FIGHT INFLAMMATION by INHIBITING NF-kB

BY STEPHANIE CLARK

Where there's **aging**, there's also chronic **inflammation**.

The relationship is so close that scientists have coined the term **inflammaging**.¹⁻³

It refers to the chronic, low-grade **inflammation** that occurs as we grow older, and contributes to the development of **age-related** disorders.

If we can stop this type of inflammation, we can slow and help reverse a major cause of degenerative aging.

Studies have uncovered one key factor: a gene-regulating protein complex called:

Nuclear Factor kappa B (NF-kB)

NF-kB is a primary driver of inflammation in the body. Inhibiting production of **NF-kB** can *prevent* inflammation.

No safe and reliable drugs can do that.

But a variety of currently available **nutrients** can.

By inhibiting cellular **NF-kB**, you have the capacity to slow down **inflammaging**.⁴

Numerous studies published in **2018** alone show that **NF-kB-inhibiting** nutrients can help fight the following aging factors:⁴⁻¹⁴

- Insulin resistance
- Brain cell degradation
- Cancer development
- Heart muscle alterations
- Asthma
- Poor wound healing
- Arthritis

This is only a partial list.

The discovery that we can inhibit **NF-kB** means we're gaining ground on slowing degenerative aging in a practical way.



How NF-kB Promotes Inflammaging

Inflammation in cells and tissues has a common pathway: activation of **nuclear factor kappa B (NF-kB)**.

“Nuclear” in this case refers to the *nucleus* of the cell, where chromosomes carry genetic information that influences NF-kB.

When NF-kB gene expression signals move into a cell’s nucleus, it activates **pro-inflammatory** signals called *cytokines*.

These **cytokines** travel through the circulatory system to trigger **inflammatory** changes in tissues everywhere in the body.

Inflammation promotes diseases through an array of biochemical pathways. Inflammation has even been shown to shorten *telomeres*, (*repetitive nucleotide sequences* at the ends of chromosomes).

When telomeres shorten, cells eventually stop functioning, directly contributing to shortened cellular lifespans.¹⁵⁻¹⁸

Increased levels of chronic inflammation induces destructive processes inside cells, rapidly producing still *more* NF-kB activation and an accelerating cycle of inflammation. This results in cell death, tissue loss, DNA damage, and other harmful changes that come with aging.^{7,17-19}

The good news is this cycle can be partially stopped. While NF-kB activation *promotes* inflammaging, *blocking* NF-kB inhibits **inflammaging**.

A group of **nutrients**, long ago available in supplement forms, have shown the ability to inhibit NF-kB.²⁰

Curcumin: Grandfather of NF-kB Inhibitors

The turmeric-derived compound *curcumin* is among the oldest-known NF-kB-inhibiting nutrients. More than a thousand studies have been performed on it, most since **2007**.

Studies show that curcumin’s NF-kB-inhibiting properties may help **prevent** and **treat cancers**, including chronic lymphocytic leukemia, pancreatic cancer, liver cancer, and some pre-malignant conditions (when combined with conventional therapies).²¹⁻²⁴

In one finding, curcumin’s **NF-kB blockade** directly led to selective **depletion of cancer stem cells** in a lab model of liver cancer.²⁴ Cancer stem cells retain primitive survival characteristics, often resisting chemotherapy and re-emerging after treatment. This is a major cause of post-therapy cancer recurrence, so getting rid of **cancer stem cells** is critical for long-term, complete responses or remissions.

Another study revealed that curcumin can sensitize liver cancer cells to **radiation** treatment through reduction of NF-kB, with the potential for lowering radiation doses.²⁵

Curcumin’s NF-kB-inhibiting benefits go beyond fighting cancer. In **metabolic diseases** (obesity, diabetes, metabolic syndrome), **fat tissue** pumps out inflammatory cytokines. Animal models show that by inhibiting NF-kB, curcumin protects liver tissues from fat deposition and *prevents* progression of fatty liver disease to **non-alcoholic steatohepatitis** (a precursor of cirrhosis and liver cancer).²⁶

In rats fed a high-fructose diet (a guaranteed way to produce metabolic abnormalities), curcumin treatment reversed insulin resistance. It also lowered blood sugar, cholesterol and triglycerides, and a host of markers of fat-induced inflammation.²⁷

Individual animal studies now indicate promise for **curcumin** in preventing many other NF-kB-associated ailments, including:

- Toxin-induced liver damage,²⁸
- Colitis (inflammation of the colon, a precursor of colorectal cancer),²⁹
- Stroke-induced brain damage,³⁰
- Lumbar disc degeneration,³¹
- Obesity-induced, fatty acid damage to heart muscle and resulting fibrosis,³² and
- Severe, acute pancreatitis.³³

Curcumin is one of the most important NF-kB-inhibiting natural compounds.

Fish Oil Fights Inflammation

A **2016** study demonstrated that regular fish consumption lowered the risk of dying by **11%**.³⁴

This helps support the idea that reducing inflammation can lead to improved longevity. And **fish oil** (rich in **omega-3 fatty acids**) has a compelling track record as an anti-inflammatory, with potent impact on NF-kB.^{35,36}

The NF-kB-inhibiting properties of fish oil and omega-3 fatty acids are important in preventing the blood vessel **inflammation** that contributes to formation of **atherosclerosis**.

Studies in cell cultures show that by inhibiting NF-kB, the omega-3 fatty acid known as EPA significantly reduces the degree to which blood cells stick to vessel linings, an important early step in plaque formation that leads to artery blockages.³⁷

Diabetes and obesity are major **dementia** risks, largely due to the chronic **neuroinflammation** to which they are linked.³⁶ In a mouse model of neuroinflammation, supplementation with two omega-3 fatty acids, **EPA** and **DHA**, inhibited NF-kB and sharply suppressed brain cell inflammatory responses.³⁶

Another metabolic disorder that can accompany obesity is **non-alcoholic fatty liver disease** (NAFLD). This can eventually progress to **non-alcoholic steatohepatitis** (NASH), an inflammatory condition

NF-kB-Inhibiting Supplements

- **Acute inflammation can be lifesaving.** It is our body's immediate response to infection and tissue damage.
- **But prolonged, chronic inflammation is a killer,** accelerating the aging process and bringing on the dreaded, chronic diseases of aging.
- **Ordinarily, medications fight each inflammatory disease separately.** One kind of drug treats inflammatory bowel diseases, another targets heart disease and stroke prevention, and still others focus on cancer, osteoporosis, and neurodegenerative diseases.
- **Chronic disease continues to debilitate and kill Americans prematurely.**
- **Inhibiting NF-kB shuts down an entire cascade of signaling events leading to inflammation and chronic disease.**
- **While no safe and effective drug can suppress NF-kB, many nutritional supplements have that ability,** which may account for their unsurpassed impact on slowing aging.
- **Age-decelerating properties induced by NF-kB inhibition are now recognized in curcumin, fish oil, the sulfur-containing NAC and ALA molecules, Reishi mushroom extracts, extracts of grapes and other berries, and green tea.**
- **Slowing aging and supporting total body health has never been easier, with this wide array of age-decelerating, NF-kB-inhibiting supplements at our disposal.**



that is a major cause of cirrhosis and liver cancer, and one of the main reasons for liver transplants in the U.S.³⁸

Animal studies reveal that omega-3 supplementation in mice fed a high-fat diet can prevent accumulation of liver fat and suppress markers of inflammation—again, through inhibition of NF-kB.³⁹

Inflammatory bowel disease (IBD) is another potentially deadly condition affecting millions of Americans.⁴⁰ IBD can lead to colorectal cancer and may require removal of substantial sections of the bowel. But animal studies show that **omega-3** fatty acids can augment standard therapy by reducing NF-kB activation, an effect which has also shown promise in reducing colon cancer risk.^{35,41}

Researchers are constantly making new discoveries about the beneficial properties of fish oil. One exciting area of study is the involvement of specialized biochemical mediators derived from fish oil called **resolvins**. Resolvins are remarkable because rather than inhibiting inflammation, these intriguing biochemical factors promote *resolution* of inflammation including reduction of NF-kB.^{42,43}

In a clinical trial in obese women, an increase in resolvins was associated with the improved resolution of a range of inflammatory markers.⁴² This effect could reduce the risk of pro-inflammatory effects on the cardiovascular system related to obesity.

Fish oil and omega-3s have demonstrated, in clinical and animal models, inhibition of NF-kB in several serious conditions:

- Osteoporosis,⁴⁴
- Leukemia,⁴⁵
- “Dry” age-related macular degeneration, a major cause of vision loss in older people, and⁴⁶
- Severe, acute pancreatitis.⁴⁷

Consuming fish oil is clearly an important way to control NF-kB and improve health—but the source of the fish oil matters.

Lipoic Acid and NAC Lower NF-kB Levels

Oxidative stress in the body stimulates the activation of **NF-kB**, which leads to harmful **inflammation**.

Two compounds, **lipoic acid (LA)** and **n-acetyl cysteine (NAC)**, have the ability to *prevent* oxidative stress and damage.⁴⁸⁻⁵⁰ They do this by scavenging cellular toxins—particularly reactive oxygen and nitrogen compounds that tear at cell and mitochondrial membranes and damage protein and DNA molecules. By cutting off these stressors, both LA and NAC *decrease* cellular levels of NF-kB.^{48,49,51}





Reishi
Mushroom

In animal research, *alpha-lipoic acid* has shown promise for alleviating metabolic abnormalities by reducing, through NF-kB inhibition, the amount and activation of inflammatory cells in fat tissue and artery-hardening plaque.^{52,53}

Alpha-lipoic acid also supported bone and joint integrity. It did this by preventing bone loss and NF-kB-induced inflammation and subsequent bone destruction in the joints of animals with experimentally induced arthritis. It also promoted *new* bone formation in a rat model of post-menopausal osteoporosis.^{48,54}

NF-kB inhibition and the resulting reduction in inflammatory **cytokines** and protein-melting *enzymes* are also credited with preventing ultraviolet-light-induced degeneration of the cornea and conjunctiva of the eye in an animal model. These are vital steps in **cataract prevention**.⁵⁵

NAC has been shown in animal studies to quench NF-kB activation, thereby reducing experimentally induced **autoimmune** reactions, a model of inflammation.⁵¹

In animal models of inflammation-driven liver injury, **NAC** prevented **liver cell damage** and enhanced availability of energy to healing liver cells.⁴⁹

In an animal model of **Parkinson's disease**, NAC's inhibition of NF-kB reduced the loss of important

dopamine-receiving cells. The death or impairment of these cells through exposure to inflammatory *alpha-synuclein* is a hallmark of this chronic, neurodegenerative condition.⁵⁶

In a study on elderly rats, the combination of three nutrients, alpha lipoic acid, NAC, and *alpha-tocopherol* (a vitamin E form), slowed **brain aging** by inhibiting NF-kB and reducing brain inflammation.⁵⁷

Anti-Inflammatory Effects of Reishi Mushrooms

The **Reishi mushroom** (*Ganoderma lucidum*) has been demonstrated to have anti-inflammatory properties.^{6,58} Studies have found effects of Reishi components and extracts in models of *inflammatory bowel disease*, in which these compounds reduce the cell-to-cell signaling that promotes and sustains these serious and troubling conditions.^{58,59}

In cultured white blood cells from individuals with Crohn's disease, *Ganoderic acid* derived from reishi mushrooms significantly decreased production of inflammatory cytokines.⁵⁹

Ganoderic acid also shuts down NF-kB in cancer cells, leading, through a complex signaling cascade, to the cells' self-destruction by the protective process called *apoptosis* (or programmed cell death). This can prevent tumors from fully developing.⁸



Many other Reishi components have been found to exert chemopreventive effects in lung cancer, the leading cause of cancer deaths in both men and women.⁶⁰

Reishi mushrooms can also have an impact on the reduction of inflammation in blood vessel walls, a major cause of **atherosclerosis** and cardiovascular diseases. A study in mice showed that treatment with Reishi polysaccharide components *reduced* NF-kB-promoted inflammatory signaling in the smooth muscle layer of the aorta, an important first step in preventing plaque formation.⁶¹

Brain inflammation increases seizure risk in the short term and contributes to neurodegeneration over longer periods. Ganoderic acid A from Reishi mushrooms, applied to immune system cells (glial cells) from mouse brains, significantly dropped production of inflammatory cytokines through NF-kB inhibition.⁶ The effect is likely to reduce seizure risk and potentially *prevent* long-term neurodegeneration.

Other Plant Extracts That Inhibit NF-kB

Healthy plant foods form the basis of the best-proven disease-fighting diets. One reason may be their content of compounds (*phytonutrients*) with a proven ability to inhibit **NF-kB**.

Here is a short list of some common phytonutrient supplements now known to have NF-kB-inhibiting properties:

- **Green tea** and its primary polyphenol component, **epigallocatechin gallate (EGCG)**, have **chemopreventive activity**. Studies highlight how these compounds block the inflammatory steps that promote cancer growth.^{9,62-64} In a 2018 study, EGCG proved capable of ameliorating age-induced heart muscle enlargement and stiffening, important findings for heart disease prevention.¹⁰
- **Cyanidin-3 glucoside (C3G)** is a dark-colored polyphenol, found especially in dark fruits and berries. **C3G** has NF-kB-inhibiting properties. These effects show promise for prevention of **cardiovascular disease** (through reduction of inflammation-promoted endothelial dysfunction), **inflammatory bowel disease**, and **retinal degeneration**.⁶⁵⁻⁷¹

- **Resveratrol** is a polyphenol found in red grapes and wine, which has also been shown to prevent **retinal degeneration** in aging animals, thanks to inhibition of NF-kB.⁷² This property of resveratrol has also shown promise in patients with the inflammatory bowel disease ulcerative colitis, for which a dose of **500 mg/day** improved quality of life and reduced disease activity.⁷³ The ability of resveratrol to favorably influence NF-kB signaling helps explain its ability to improve insulin sensitivity in lungs of high-fat-diet-fed mice, to prevent osteoporosis and osteoarthritis-like changes in rats, and to prevent thyroid cancer in rodents.^{11,14,74,75}

Summary

Inflammation is a double-edged sword. We need it to fight off infections and clean up at sites of injury or damage. But prolonged, unresolved inflammation promotes degenerative diseases and accelerates aging.

Fighting chronic, low-grade inflammation is a critical tool for slowing degenerative aging and mitigating—or preventing—its symptoms.

At the heart of inflammation lies the signaling molecule **nuclear factor kappa B (NF-kB)**, which responds to stimuli outside of cells by migrating to the cell's nucleus and turning on the genes that generate **pro-inflammatory** signals (cytokines and other molecules).

By *inhibiting* NF-kB activation, we can *reduce* harmful inflammation and decelerate many aging processes.

No safe and reliable drugs exist for that purpose. Fortunately, we can turn to some of the best-known, natural supplements for potent, safe NF-kB inhibition.

Examples abound, from turmeric-derived **curcumin** to cold water **fish oils**, lipoic acid and NAC, as well as familiar plant nutrients including green tea, dark berries, and resveratrol.

These non-drug compounds provide a powerful way to keep **NF-kB** in check—and protect against many of the adverse effects of 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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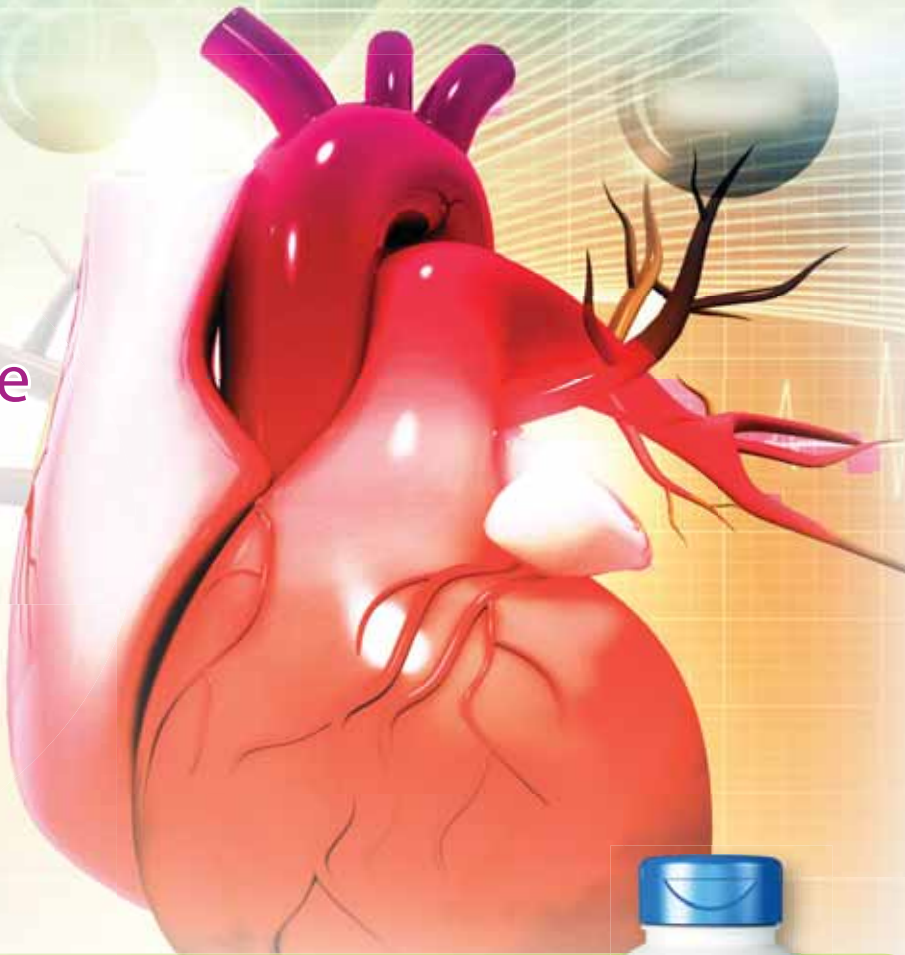
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ORAL SUNSCREEN Provides *All-Over* PROTECTION

BY MICHAEL DOWNEY

For decades, we've been told how to protect our skin against the damaging effects of the sun:

Always wear sunscreen outdoors!

That's good advice but it is not a perfect solution. Topical sunscreens must be spread over every exposed area to be effective, they must be reapplied regularly, and they can stain clothing.

Scientists have identified a tropical fern extract called ***Polypodium leucotomos*** that, when taken **orally**, works deep *inside* skin cells to reduce the harmful effects of ultraviolet light.

In fact, *Polypodium*-supplemented participants demonstrated a striking **84% decrease** in DNA mutations when exposed to ultraviolet light.¹

Researchers have combined *Polypodium leucotomos* with two other protective compounds, **nicotinamide** and **red orange extract**, offering superior protection from sun damage not available from using sunblock alone.



Protection against Ultraviolet Radiation

Ultraviolet (UV) radiation damage to DNA is the main cause of skin cancer, and the primary culprit in skin photoaging.²⁻⁴

There are multiple reasons UV radiation does so much damage. For one thing, UV radiation from the sun appears to stimulate the most intensive free-radical formation.⁵ UV radiation also stimulates reactions that can increase mutations and alter DNA itself.⁶

These reactions alter a vital tumor-suppressor gene called **p53**. We know that **p53** is critical for DNA repair and for programmed cell death (**apoptosis**) when DNA damage is beyond repair.⁷⁻⁹

UV radiation also *inhibits* production of **ATP (adenosine triphosphate)**, which is required in order to whisk away damaged DNA segments.¹⁰⁻¹³

Wearing sunscreen *is* vitally important. But it doesn't provide **total protection** from ultraviolet rays. It doesn't usually protect the scalp or eyelids, it may come off with perspiration or swimming, and most people don't use nearly enough, or reapply it frequently enough, to block the sun's harmful rays. UV rays can even penetrate some fabrics to reach parts of the body covered by clothing.¹⁴

Since protection against UV radiation is never absolute, scientists recognized that it is important to find a way to promote prompt DNA repair in order to *prevent* malignant transformation in skin cells.^{15,16}

Researchers focused on *Polypodium leucotomos*, a tropical fern native to Central and South America. It has been used to treat psoriasis and other skin conditions.¹ Because it is taken **orally**, it protects all skin areas evenly and won't wash or rub off.

Research has found that it has an ability to **protect** and **repair DNA**. *Polypodium leucotomos* extract is rich in **polyphenols** that inhibit oxidative stress and inflammation, while protecting skin cells against DNA damage caused by UV radiation.¹

Through all these mechanisms, this plant extract delivers a powerful *internal* defense against ultraviolet radiation.

Results of Clinical Studies

Scientists enlisted healthy volunteers, aged 29 to 54, for a clinical study. The individuals were divided into control and treatment groups and the treatment participants were given **two 240 mg** doses of *Polypodium leucotomos* extract orally. All subjects were then exposed to ultraviolet-A radiation (UVA), first at a low exposure level and then at a higher level.¹

After low-level UVA exposure, scientists found that placebo participants had a **217% increase** in damaging DNA mutations. By contrast, the *Polypodium*-supplemented participants had a striking **84% decrease** in these mutations.¹

Following high-level UVA exposure, DNA mutations in the placebo group increased by a startling **760%**. However, DNA mutations in the *Polypodium*-supplemented group increased by only **61%**.¹

Since DNA mutations are the main cause of prematurely aged skin *and* skin cancer,^{4,6,11,17,18} this level of DNA protection against ultraviolet exposure has enormous potential benefits.

This strong level of sun defense has been further increased. Researchers have combined the fern extract



Polypodium leucotomos with two additional protective ingredients: **nicotinamide** and **red orange extract** for enhanced skin protection.

Benefits of Nicotinamide

Two recent studies summarized the ability of **nicotinamide** to prevent UV-light-induced skin cancer. This form of vitamin B3 has been shown to:^{19,20}

- Enhance DNA repair,
- Modulate production of inflammatory proteins called cytokines,
- Reduce UV-induced immunosuppression of skin responses,
- Regulate skin barrier function, and
- Restore cellular energy levels after UV exposure.

UV radiation reduces the production of **ATP**, the cellular energy that the body needs to support DNA repair. **Nicotinamide** helps solve this problem by preventing loss of ATP in cells.¹² Nicotinamide can also be made into **nicotinamide adenine dinucleotide (NAD⁺)**, a key compound that helps the body make ATP.²¹

To verify these effects, scientists pretreated skin cells with nicotinamide and exposed them to UV radiation. The nicotinamide enhanced the **removal and replacement of damaged DNA** and significantly increased the number of cells undergoing DNA repair.²¹

Prevent UV-Radiation-Induced Damage

- Photoaging and skin cancer are caused in large part by **ultraviolet** radiation, but topical sunscreens can wear off with perspiration, stain clothing, and leave some areas unprotected.
- Research shows that a tropical fern extract called *Polypodium leucotomos*, when taken **orally**, reduces the harmful effects of solar radiation. It helps prevent cell damage and supports DNA repair, inhibiting cancer risk and skin aging.
- The addition of **nicotinamide** and **red orange extract** further boosts sun protection, and all three ingredients work together from the inside out to provide protection that won't rub or wash off.
- For optimal sun exposure protection, this potent defense should be combined with a high-quality, high-SPF topical sunscreen.



Another clinical trial showed that nicotinamide protects against UV-induced **immune suppression**.²²

These dual benefits—repairing DNA and inhibiting immune suppression—contribute to nicotinamide’s protection against the sun’s damaging effects.

Scientists conducted a clinical study on 386 healthy individuals who had been diagnosed with at least two non-melanoma skin cancers within the last five years, which placed them in a “high-risk” category. After taking **500 mg** of nicotinamide **twice daily** for 12 months, the rate of new, non-melanoma skin cancers was reduced overall by **23%**, compared to the control group.²³

Red Orange Extract

Red orange extract provides further protection against UV-induced inflammation and oxidative stress. Obtained from three pigmented varieties of sweet oranges (*Citrus sinensis*), its benefits result from high levels of three natural compounds with powerful antioxidant effects: anthocyanins, flavanones, and hydroxycinnamic acids.²⁴⁻²⁷

In a lab study, researchers applied red orange extract to human **keratinocytes**, the most common type of cell in the epidermis, the outermost layer of our skin. Then they exposed these treated cells to UV radiation, and they observed that the extract significantly *reduced* cell damage, inflammation, and cell death.²⁵

Scientists then moved on to **human** studies of red orange extract’s protection against UV radiation. Oral supplementation with the extract was demonstrated to **reduce sunburn intensity by about 35%**.²⁸

The amount of lifetime sun exposure and the number of lifetime severe sunburns is closely correlated with the development of skin cancers, so this protection is extremely significant.²⁹⁻³¹

In another clinical study, researchers demonstrated that red orange extract protects against UV-induced **photoaging**. For 15 days, volunteers took red orange extract and were exposed regularly to a solar lamp. The extract reduced UV-induced sunburn, as well as age-spot pigmentation, and decreased melanin content from **27% to 7%**.³²

The study concluded that red orange extract can lead to an improvement in skin appearance and can protect the skin from harmful sun damage.³²

Summary

Photoaging and skin cancer can result from exposure to solar **ultraviolet** radiation.

Topical sunscreens seldom protect eyelids and other exposed skin, they wear off with perspiration or swimming, and they can stain clothing.

Research shows that a **fern extract** called *Polypodium leucotomos*, taken **orally**, inhibits cell damage and supports DNA repair, two key mechanisms that lower cancer risk and help prevent premature skin aging.

Adding **nicotinamide** and **red orange extract** offers a greater level of sun protection.

Supplementation with these three ingredients ensures evenly distributed skin protection from the *inside out*, that doesn’t rub or wash off.

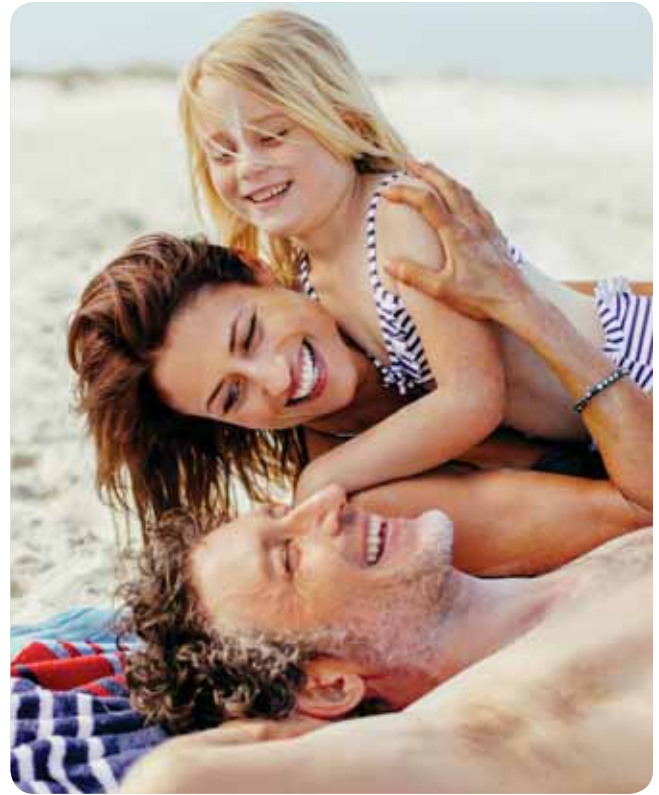
Combined with a high-quality, high-SPF topical sunscreen, this oral supplement provides a potent defense against sun damage. ●



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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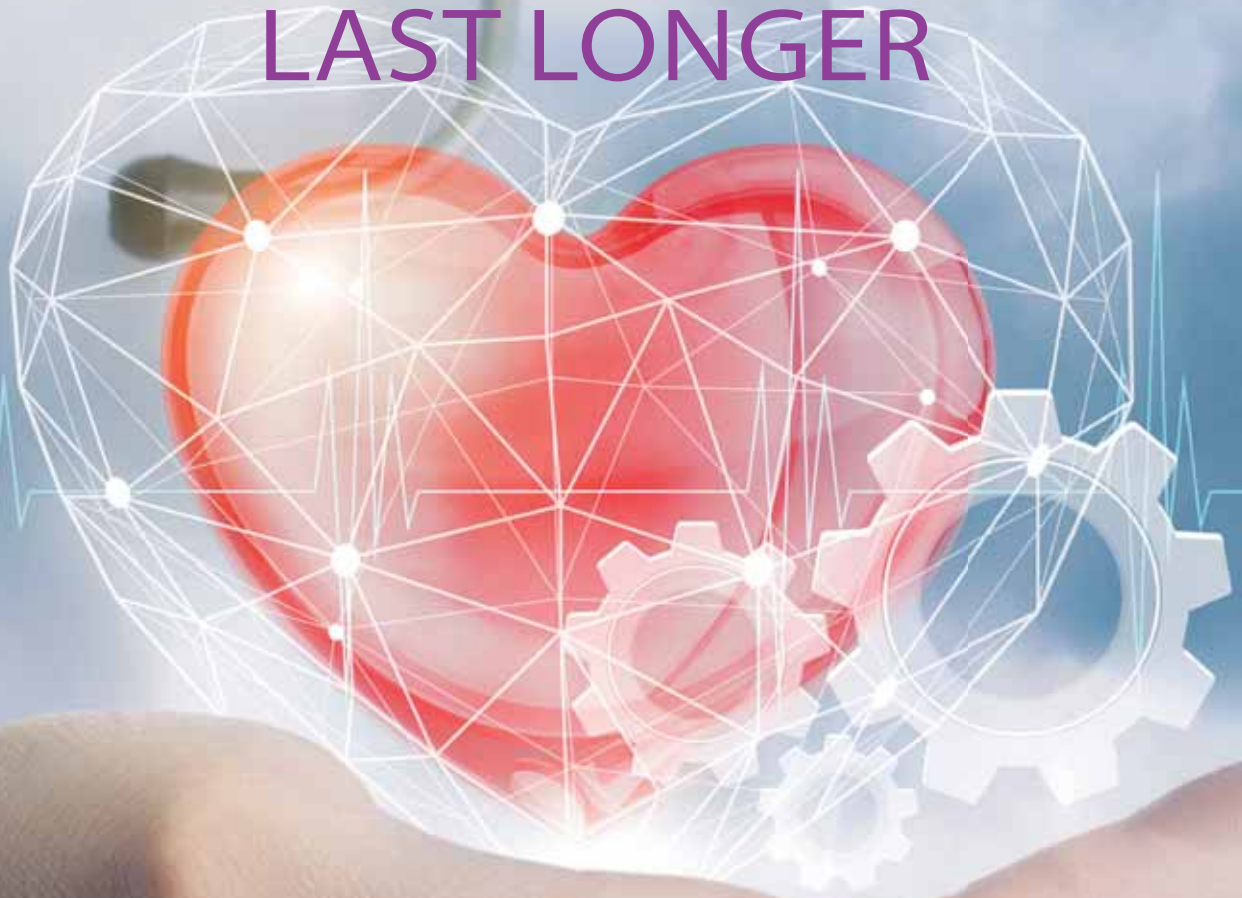
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Making Your
HEART Age Slower
So You Can
LAST LONGER





BY PAUL MCGLOTHIN

Your heart needs no introduction. It's one of your body's most important organs: When it goes, you go—and if it thrives, you will thrive too.

A youthful heart can help you live a vigorous, productive life, and protect against dementia.¹ The other good news is you do not have to be young to have a young-functioning heart.

Ev, an impressive 82-year-old from Hawaii has been a CR Way member for five years. He follows the CR Way's young-heart strategy and his results are terrific. His blood pressure is **90/70 mmHg**, total cholesterol: **149 mg/dL**, LDL: **80 mg/dL**, triglycerides: **80 mg/dL**, HbA1c: **4.5%**, and fasting blood glucose: **72 mg/dL**.

When you talk with Ev, you might think that he is in his 40s, or maybe 50s. It's likely that his optimal cardiovascular system helps him sound young and communicate so effectively.

CRWAY

What is Your Young-Heart Strategy?

The American Heart Association’s (AHA) strategy for maintaining a healthy heart suggests four modifiable behaviors (not smoking, healthy weight, eating healthy foods, and being physically active) as well as three objective measures of cardiovascular and metabolic health (blood pressure control, lower cholesterol and blood sugar).²

If you want a normal lifespan of around 80 years, without developing cardiovascular disease, incorporate these conventional guidelines into your life.

To increase your chances of extending your life, slowing your rate of aging, and enjoying a quality of life like that of a person who is 10 or 15 years younger, check out the **CR Way Young-Heart Strategy**. The CR Way is for people who want an energetic lifestyle: working, hiking, painting their house, playing sports, making love—enjoying whatever activity they choose.

The chart on page 68 shows how the CR Way health behaviors and metrics compare to the American Heart Association’s.³

Addressing How Your Heart Ages

Starting with heart-healthy-living criteria is a great beginning, but the most successful young-heart strategies protect against the way the heart ages.

For example, as the years roll by, your heart and arteries can degenerate, becoming stiff with fibrous tissue. Stiffness impedes blood flow and the constant pumping action your heart must perform. Over time, fibrous remodeling can shorten how long your cardiovascular system lasts.

One potential way to counter some of the long-term buildup of cardiac stiffness is to lower **Transforming Growth Factor Beta (TGF-β)**. TGF-β activity can be reduced through good glucose control.

TGF-β refers to a group of polypeptide growth factors involved in a vast array of functions and pathways in the body.⁴ Unfortunately, excessive glucose can activate TGF-β-promoting fibrous tissue formation in the heart and other organs, including the kidneys and lungs.^{5,6}

Let AMPK Manage Your Heart

Low glucose levels also help activate a heart-friendly manager that lives within you: **Adenosine Monophosphate Activated Protein Kinase** or **AMPK**.⁷

When new members join **LivingTheCRWay**, they learn how to activate AMPK through an online and telephone, nine-week course in glucose management: *The CR Way to Great Glucose Control*. A primary goal

of the course is to help participants get their fasting glucose to healthy, low levels.

AMPK has beneficial effects for the cardiovascular system.⁸ CR Way practitioners often notice that their total cholesterol levels are reduced along with their LDL (bad cholesterol).

AMPK helps your body shift from fat storage to fat burning. Research shows that AMPK activation reduces atherosclerotic plaque formation in mice.⁹ And with the shift to fat burning, triglycerides are also reduced. My **triglycerides** were at high risk levels before starting the CR Way. Now they are in the **50s (mg/dL)**.

Another heart-friendly effect of **AMPK** is increased production of *nitric oxide* (NO).¹⁰ Normally, this vital compound decreases with age.¹¹ However, AMPK increases NO, causing arteries to dilate and blood pressure to fall.¹²⁻¹⁴ The average blood pressure of serious, long-term CR Way practitioners is **100/60 mmHg**. Elevated blood glucose decreases the bioavailability of nitric oxide and increases cardiovascular risk.¹⁵





Activating AMPK is fundamental to a new program LivingTheCRWay has launched:

Optimal Heart Health – The CR Way®

Created to help people slow heart aging, our **Optimal Heart Health Program** calls for annual echocardiograms to monitor the heart’s structural changes, as well as sonograms to evaluate calcification buildup and risk.

If you are 60 or older, the chances are good that calcification will show up in such evaluations. In their publication on vascular calcification, Demer and Tintut show that vascular calcification reduces artery elasticity, impairs cardiovascular functions, and may predict cardiovascular mortality.¹⁶

Important questions to ask about artery calcification are *How much?* and *Will it increase from year to year?* Calcification can be pivotal: It could end your life, or—if you can minimize it—your life may last much longer.

New CR Way members are encouraged to get annual scans and to work on cardiovascular risk factors, managing them in a way that minimizes their threats.

Attention, Breast Cancer Survivors!

Another concern needs to be mentioned: If you are a breast cancer survivor, you may have had radiation treatment of your breast. Such treatments can contribute to ischemic heart disease (coronary artery disease), and it often doesn’t show up right away. According to one study, patients who receive these treatments are at risk for ischemic heart disease for at least 20 years after treatment.¹⁷

I mention the heart risk posed by radiation therapy for breast cancer because it may be unexpected. It might not be detected by “normal” cardiovascular exams, but an echocardiogram may detect it.

Microbial Considerations

The next time you go to your dentist ask about his or her observations regarding periodontal disease and heart health. Most likely, your dentist will know about patients who had gum disease and developed significant heart problems. The dentist may even cite research showing that periodontal disease correlates with pathogens like *P. gingivalis* (Porphyromonas gingivalis), that is part of the normal, healthy, oral microbiome, and is associated with heart disease¹⁸ as well as Alzheimer’s disease¹⁹ and cancer.²⁰

P. gingivalis can cause harm when acting alone, but it can also work against your health in combination with other pathogenic species and in people whose immune systems are compromised.

Change your Heart’s Aging Trajectory

Globally, more people die annually from cardiovascular diseases (CVD) than from any other cause.²¹

The World Health Organization reports that globally, an estimated 17.9 million people died from CVD in 2016, representing **31%** of all deaths.²¹

In the U.S., CVD causes one death approximately every 38 seconds.²²

Protect yourself and everything you hold dear. For your heart’s sake, use science to make that old Frank Sinatra song, “Young at Heart,” your reality. ●

American Heart Association Behaviors and Metrics Compared to CR Way®

AHA	Living The CR Way*
Nonsmoking: (Never smoked or quit >1 year ago)	Nonsmoking: (Never smoked or quit >1 year ago)
BMI: 18.5 to 24.9	BMI: 19 to 23
Physical activity: <ul style="list-style-type: none"> • At least 150 minutes (moderate intensity) weekly, • or 75 minutes (vigorous) weekly 	Physical activity: <ul style="list-style-type: none"> • 1 to 2 hours daily (moderate intensity) • Heavy weights twice weekly
Diet: <ul style="list-style-type: none"> • Fruits and vegetables ≥4.5 cups daily • Fish (preferably oily) ≥two 3.5 oz. servings weekly • Fiber-rich whole grains (1.1 grams fiber per 10 grams carbohydrate) ≥three 1 oz. equivalent servings daily • Sodium < 1,500 mg/dL • Sugar-sweetened beverages <450 kcal (36 oz.) weekly 	Diet: <ul style="list-style-type: none"> • Plant-based, optional fatty fish with high omega-3 content • Meals planned to keep your glucose at optimal levels and to activate longevity biochemistry, as described in The CR Way to Great Glucose Control
Total cholesterol: <200 mg/dL	Total cholesterol: <150 mg/dL
Blood pressure: <120/80 mmHg	Blood pressure: Average: 100/60 mmHg
Fasting blood glucose: <100 mg/dL	Fasting blood glucose: <80 mg/dL
<p>.....</p> <p>* Note: This information is intended to be educational and informational and is not to be considered a substitute for advice from a medical professional.</p> <p>** U.S. Environmental Protection Agency Particle Pollution Designations Process: https://www.epa.gov/particle-pollution-designations/learn-about-particle-pollution-designations#process</p>	Additional CR Way behaviors and metrics: <ul style="list-style-type: none"> • Deep, satisfying sleep • Friendly, supportive social network • Optimal microbiome health (reduced levels of pathogenic microbiota) • Regular sun exposure • Pure air to breathe (<40 PM2.5) ** • 99.9% pure H₂O for drinking & cooking • Annual blood tests, noninvasive heart and artery evaluations • Thorough dental cleanings and evaluations at least twice yearly

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

Paul McGlothlin and Meredith Averill have discovered the bridge between scientific research and its practical application for a better, longer life. Their work brings real results and longevity benefits to CR Way practitioners. Their CR Way lifestyle is based on decades of research, showing favorable changes in genes and other biomarkers of aging. They have played a pivotal role in this research on aging at Washington University, in St. Louis School of Medicine, and at the University of California at both San Francisco and Riverside. You can find more about them and the benefits of LivingTheCRWay membership by calling 877-481-4841 or visiting www.livingthecrway.com.

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Michael Ozner, M.D.

Is “Good Cholesterol” Always Good?

The deadliest killer of men and women, responsible for more deaths than any other disorder, is cardiovascular disease—which includes heart attack and stroke.

“The good news,” says leading cardiologist Dr. Michael Ozner, is that, “cardiovascular disease is virtually preventable with a healthy lifestyle and medications (if needed).”

In this interview with *Life Extension*® Dr. Ozner discusses new approaches to assessing an individual’s risk factors, preventing illness, and staying healthy. What you may not know about your cholesterol levels could surprise you.

LE: Most people are familiar with their cholesterol levels and the ways in which they may predict risk for cardiovascular disease. Is there anything new you can tell us about that?

Dr. Ozner: **High-density lipoprotein** (HDL) cholesterol is commonly referred to as the “good cholesterol.” That’s because it *generally* carries harmful fats away from the artery wall to the liver for processing and elimination.

Physicians have told people to aim for an HDL cholesterol level of at least **50 mg/dL** for women and at least **40 mg/dL** for men. Previous research seemed to indicate that *lower levels* of HDL were linked to a *higher risk* for cardiovascular disease (CVD). As far as HDL goes, doctors have always assumed “more is better.”

However, new research has shown that high HDL levels may not always help protect against cardiovascular disease. In addition, clinical trials designed to raise HDL cholesterol with medications have failed to reduce the risk of cardiovascular disease.



MICHAEL OZNER, M.D.

LE: That's very important, new information. What else has recent research discovered?

Dr. Ozner: More has been discovered about the structure and function of HDL. It has become clear that HDL can be a double-edged sword. HDL can either be *helpful* by playing an anti-inflammatory and antioxidant role, or *dysfunctional* and *harmful* by promoting inflammation and oxidation.¹ In addition, the ability of HDL to remove cholesterol from the artery wall can be variable.

LE: Are you saying that it's not just about the numbers, the cholesterol levels?

Dr. Ozner: While epidemiology research confirmed the well-established cardiovascular risks for extremely *low* levels of HDL, the risk or benefit of HDL is dependent on *HDL function* rather than absolute levels. In addition, *low HDL cholesterol* is often associated with *high triglyceride levels* which can be harmful. In fact, several clinical trials looking at genetics demonstrated that it is the *elevated triglycerides* that cause increased CVD risk, and not the low HDL cholesterol.³

LE: So how can you tell what your HDL level means?

Dr. Ozner: One way to measure HDL *function* is to test *cholesterol efflux* of HDL particles. However, this test is expensive, and not available in commercial labs. Nevertheless, when looking at one's risk for cardiovascular disease, the key is to remember that your HDL cholesterol level is only *one* way that doctors assess the risk. **Low-density lipoprotein**

cholesterol (LDL), the so-called "bad" cholesterol, and **triglycerides**—both of which are linked to increased coronary heart disease risk, must also be factored into your cardiovascular disease risk profile. Non-HDL cholesterol measurement (obtained by subtracting HDL cholesterol from total cholesterol) is also an important marker for coronary heart disease and heart attack risk. Elevated levels of non-HDL are a better predictor of heart disease than LDL cholesterol alone. A normal non-HDL cholesterol is less than **130 mg/dL** and an optimal level in individuals at increased cardiovascular risk is less than **100 mg/dL**.

LE: Are there new guidelines for optimal cholesterol and triglyceride levels?

Dr. Ozner: While most guidelines recommend an LDL cholesterol level of less than **100 mg/dL**, clinical studies show that lower is better and *optimal* levels are less than **70 mg/dL** for those at high risk or with preexisting cardiovascular disease. The normal level for triglycerides is less than **150 mg/dL** however optimal levels are below **100 mg/dL**.

LE: What other lab tests can help people assess their risk for coronary disease and heart attack?

Dr. Ozner: Your level of vascular inflammation, which is most commonly measured by high sensitivity **C-reactive protein (hs-CRP)** is also helpful in assessing your risk for CVD. Clinical trials have demonstrated that elevated hs-CRP is associated with increased CVD risk.^{4,5}





LE: What do you think about the data linking **apolipoprotein B** to increased arterial occlusion risk?

Dr. Ozner: **Apolipoprotein B** (ApoB), which resides on the surface of all potential atherogenic (harmful) cholesterol particles can enter the artery wall and lead to dangerous plaque buildup. ApoB is the best risk marker for coronary heart disease and heart attack risk. An optimal apoB level is less than **80 mg/dL**.

LE: What are low-cost and most important blood tests people should consider doing annually?

Dr. Ozner: Health care providers should focus on more than just the “good and bad” cholesterol levels to assess heart attack risk. A lipid panel (total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides and non-HDL cholesterol) and periodically an

apolipoprotein B and high sensitivity **C-reactive protein** measurements are important to assess coronary artery blockage and heart attack risk.

LE: Dr. Ozner, what advice would you give to people concerned about maintaining their cardiovascular health?

Dr. Ozner: It is wise for *everyone* to be evaluated by their personal physician on a regular basis and to develop a prevention plan before heart disease strikes. Follow well-established heart-healthy habits to keep your risk for cardiovascular disease in check. Eat a healthful diet, such as a Mediterranean-style plan with lots of fruits, vegetables, fatty fish and whole grains. Also, exercise for at least 30 minutes on most days, maintain normal body weight, avoid smoking, manage your stress, and get good-quality sleep. ●

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

Michael Ozner, MD, FACC, FAHA, a member of the **Life Extension Scientific Advisory Board**, is one of America’s leading advocates for heart disease prevention. Dr. Ozner is a board-certified cardiologist, a Fellow of the American College of Cardiology and of the American Heart Association, Medical Director of Wellness & Prevention at Baptist Health South Florida and a well-known regional and national speaker in the field of preventive cardiology. Dr. Ozner is also the author of *The Great American Heart Hoax*, *Heart Attack Proof* and *The Complete Mediterranean Diet*.

For more information visit:
www.drozner.com

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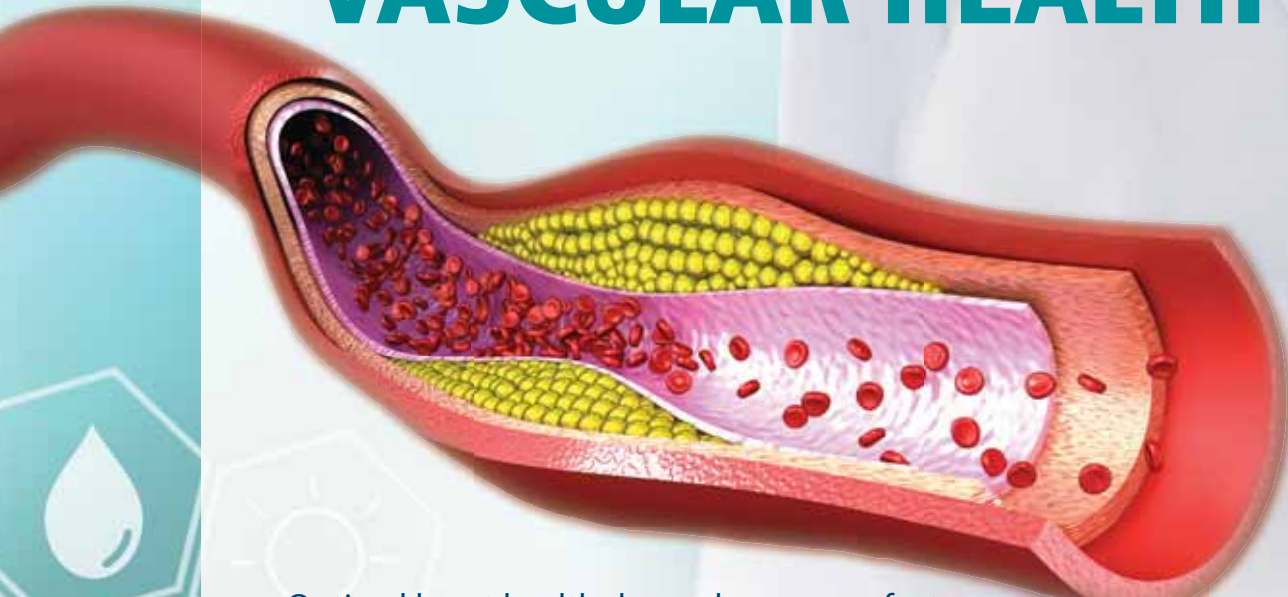
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Extra Virgin Olive Oil

BY LAURIE MATHENA

The **Mediterranean diet** is hailed for its ability to lower the risk of **heart disease, high blood pressure, stroke, and overall mortality**.¹⁻³ Many of these benefits can be credited largely to one key component of the diet: extra virgin olive oil.⁴

Research shows that people who consume the most olive oil have a lower risk of dying from **cardiovascular** events, **strokes**, or from **any cause at all**.⁵ Consuming olive oil every day may also protect against conditions ranging from Alzheimer's and osteoporosis, to skin aging, and **cancer**.⁶⁻⁹

What's more, all of these benefits are greater when **extra virgin olive oil** is substituted for regular olive oil.¹⁰

Extra virgin olive oil is less *refined*, which allows it to retain more **polyphenols**. These beneficial plant compounds are primarily responsible for extra virgin olive oil's myriad health benefits, including reducing **all-cause mortality**.⁵

Unfortunately, just because a product is labeled as "extra virgin" does not mean it has a high polyphenol content. Factors such as soil, climate, moisture, ripeness of the fruit, and processing, greatly impact the polyphenols.

Worse, many producers **dilute** the extra virgin olive oil with lower-quality oils. Shockingly, about **75%-80%** of the extra virgin olive oil brands sold in the U.S. don't even meet the legal requirements to be called extra virgin!¹¹



A Trusted Source

There is one source of extra virgin olive oil that has been proven to be packed with polyphenols, while being completely pure and unadulterated.

On a family farm in California, non-GMO olives are harvested early in the season, handpicked, and crushed immediately. The oil is then cold-extracted, stored in stainless steel tanks, and then poured directly into dark bottles (protected from the light).

The result is a product that contains over **800 mg/kg** of polyphenols, which is **three times the average olive oil polyphenol content**.

Maximize Olive Oil's Benefits

When extra virgin olive oil has a high polyphenol content, it's not just better for you—it *tastes* better too. Polyphenols are what give extra virgin olive oil its unique, fruity and spicy-peppery taste.

One of the easiest ways to incorporate it into your diet every day is simply through salad dressings.

On the following pages, **Life Extension®** has compiled a handful of flavorful salad dressing recipes. These provide a variety of flavors, but when using this California-based extra virgin olive oil, they all have one important thing in common: a *guaranteed* high polyphenol content responsible for the proven health benefits of extra virgin olive oil.

Bon Appetit!

Creamy Cilantro Lime Dressing

Makes 1 cup

- ¼ cup extra virgin olive oil**
- 1 avocado**
- ¼ cup cilantro, roughly chopped**
- 1 clove garlic, minced**
- Juice from ½ lime**
- ¼ cup Greek yogurt**
- ¼ tsp salt**
- ¼ tsp pepper**
- ⅓ cup water**

Instructions: Place all ingredients in a blender and process until smooth. Add additional water until the dressing reaches desired consistency.

Sundried Tomato Dressing

Makes 1 cup

- 1 cup extra virgin olive oil**
- ¼ cup sundried tomatoes, drained**
- 2 tbsp balsamic vinegar**
- 2 cloves garlic, minced**
- ½ tsp salt**

Instructions: Combine all ingredients in a blender and process on high until smooth.





Greek Vinaigrette Dressing

Makes 1 cup

½ cup extra virgin olive oil

¼ cup red wine vinegar

¼ cup water

2 cloves garlic, minced

¼ tsp oregano

½ tsp basil

½ tsp salt

¼ tsp pepper

2 tbsp lemon juice

Instructions: Place all ingredients in a bowl and whisk to combine, or place in an air-tight container and shake to combine.

Balsamic Vinaigrette Dressing

Makes 1 cup

½ cup extra virgin olive oil

½ cup balsamic vinegar

1 tsp Dijon mustard

½ tsp parsley

¼ tsp salt

¼ tsp pepper

Instructions: Place all ingredients in a bowl and whisk to combine, or place in an air-tight container and shake to combine.

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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Walnuts

BY LAURIE MATHENA

Walnuts are one of the healthiest nuts you can eat. These brain-shaped nuts contain a unique composition of nutrients not commonly found in other whole foods.

This is one reason why this **superfood** has been shown to help combat cognitive decline, heart disease, cancer, and more.

Brain Health

Walnuts contain polyphenol compounds that not only reduce oxidation and inflammation in the brain, but also improve signaling between brain cells and increase **neurogenesis** (the creation of new brain cells).¹

In a study of mice with Alzheimer's disease, giving them the human equivalent of a handful of walnuts daily led to enhanced memory and learning skills, superior motor development, and reduced anxiety. The authors concluded that, "Dietary supplementation with walnuts may have a beneficial effect in reducing the risk, delaying the onset, slowing the progression of, or preventing AD [Alzheimer's disease]."²

In another study, researchers concluded that eating foods like walnuts may increase "health span" while enhancing cognitive and motor function in aging.³

Heart Protection

Walnuts have beneficial effects against numerous underlying factors contributing to heart disease.

A meta-analysis was conducted, reviewing 26 clinical trials involving 1,059 people. It found that, compared to people who didn't eat walnuts, people who ate walnuts on a regular basis had modestly lower **total cholesterol (3.25% reduction)**, lower **LDL cholesterol (3.73% reduction)**, and lower **triglycerides (5.52% reduction)**.⁴ This study also found that eating walnuts did **not** increase body weight.

Cancer Prevention

Walnuts have been shown to have properties that act against numerous types of cancer. A Harvard Medical School study found that diets containing walnuts could slow the growth of **colorectal tumors** in mice.⁵

Similar results have been found with **breast cancer**. In a mouse study, mice that ate walnuts every day were less likely to develop breast cancer. And in the mice that did develop breast cancer, the tumors were smaller and slower-growing. Adding walnuts to their diet also slowed the growth of **prostate, colon, and renal cancers**.⁶

The best way to consume walnuts is with the skin on, as about **90%** of the phenols from walnuts are found in the skin.

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- Helps modulate genetic expression and activity of *androgen receptors*¹⁰
- Supports body's natural defenses against oxidation¹¹



• TURMERIC

- Promotes a healthy level of inflammatory response, chiefly due to its main component, *curcumin*¹²
- Helps modulate cell signaling mechanisms, inhibiting abnormal cell adhesion and migration¹³
- Promotes healthy cell proliferation and apoptosis¹⁴



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- Helps regulate enzymes (*phase II detoxifying enzymes*) in gut and liver tissue that helps render harmful dietary molecules harmless¹⁵
- Helps promote healthy PSA levels¹⁶
- Supports regulation of cell growth and transcription factors and normal production of apoptosis-inducing proteins^{17,18}

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COLLEEN STURGESS

Colleen Sturgess: Giving Parkinson's Patients a Fighting Chance

BY LAURIE MATHENA

When you walk into the Beyond Fitness gym in Delray Beach, Florida, you'll see people running, boxing drills, punching speed bags, doing pushups, and jumping rope.

But this isn't your typical gym—and these aren't your typical clients.

These individuals all have Parkinson's disease.

And they're not just working out; they're taking part in a program that has been scientifically proven to slow the progression of their disease. It's a non-contact, boxing-based fitness curriculum called Rock Steady Boxing.

Non-contact boxing uses the fundamental moves of boxing to improve coordination, timing and aerobic capacity without actually making contact with another person. This reduces the chance of any sort of injury while improving physical stamina.

Rock Steady Boxing's mission is to "empower people with Parkinson's disease to fight back"—a mission that Beyond Fitness owner Colleen Sturgess has taken to heart.

Sturgess, 38, has more than 14 years of experience as a fitness teacher and trainer, and has earned more than a dozen fitness certifications from organizations such as the National Academy of Sports Medicine and the National Strength and Conditioning Association. But it wasn't until she became certified as a Rock Steady Boxing trainer that she truly found her calling.

“I fell in love with it, and realized this was what I wanted to do,” said Sturgess.

While Sturgess holds classes at her gym for many specialty populations, including those with multiple sclerosis, autism, and Down syndrome, her biggest focus is on people with Parkinson’s.

Through the Rock Steady Boxing program, Sturgess helps more than 100 individuals with Parkinson’s fight back against the disease, and she sees incredible results.

“The participants are able to move better, sleep better, and think better,” said Sturgess. “They have better balance, they’re stronger, and they have more energy. Their overall quality of life is better. And they’re happier, too.”

Those improvements strike at the heart of Parkinson’s, which is a degenerative movement disorder that causes deterioration in motor skills, balance, and speech. There is no cure for Parkinson’s, but evidence shows that participating in these classes can improve the quality of life for people in all stages of the disease.

“These boxing classes slow down the progression of the disease,” said Sturgess. “They help the brain start making more connections, and ultimately help the participants improve their quality of life.”

The first program of its kind, Rock Steady Boxing incorporates various exercises that focus on speed, agility, balance, coordination, strength, and flexibility. Taught in a circuit-training format, exercises include activities like high knees, agility drills with a rope ladder, punching-bag drills with alternating hands or while standing on one foot, and much more.



The classes are designed to push people beyond their limits, but what the participants especially appreciate about them is the atmosphere.

“One of the things I like so much about the program is that it’s fun,” said Jeff Swartz, 62, who has been taking the classes for more than a year. “It’s not a chore to go work out. It’s a kick.”

Mary Goldfarb, 55, agreed.

“It’s a positive environment the minute you walk through the door,” said Goldfarb. “Colleen is very creative. Every class is different every time we go.”

Sturgess provides three different class levels based on the stages of the disease, from those in the earliest stages to those who use wheelchairs.

“If they’re using a wheelchair or walker, we’ll work on teaching them how to stand up or use their legs a little more. And if they can’t do certain exercises, we’ll give them modifications,” said Sturgess. “Sometimes they do this along with physical therapy, and sometimes instead of physical therapy.”

Backed by Science

Rock Steady Boxing was launched in 2006 by former Indiana prosecutor Scott Newman, who was diagnosed with early-onset Parkinson’s at the age of 40. A few years after his diagnosis, Newman began one-on-one boxing training, and something remarkable happened: He saw a dramatic improvement in his physical health, agility, and daily functioning.

As news of Newman’s incredible results spread, other Parkinson’s patients wanted to experience the benefits for themselves. Soon, an Affiliate Certification Training program was developed that could give people the tools necessary to implement the program in their own facilities. And in just a little more than a decade, Rock Steady Boxing ballooned into a worldwide phenomenon, with the program being implemented in more than 700 facilities across the United States, Europe, South America, Asia, Australia, and the Middle East.

Rock Steady's remarkable success is a testament to one simple fact: It works.

The program has produced such remarkable results that researchers took notice and wanted to put it to the test for themselves. In a case series published in the journal *Physical Therapy*, researchers followed six patients with Parkinson's disease who attended between 24 and 36 boxing classes over 12 weeks.* The participants also had the option of continuing the classes for a total of 24 or 36 weeks.

The researchers concluded that, "Despite the progressive nature of Parkinson's disease, the patients in this case series showed short-term and long-term improvements in balance, gait, activities of daily living, and quality of life after the boxing training program."

Having a scientific study showing the benefits can go a long way toward validating the program. But those involved in Rock Steady didn't need a study to tell them it works – they've seen the results firsthand.

Improving One Life at a Time

Mary Goldfarb and her husband Mark have only been attending Rock Steady Boxing classes at Beyond Fitness for a few months, but Mary says she noticed improvements right away.

"I have better balance, and it has helped my memory and my overall attitude," said Mary, who was diagnosed with Parkinson's more than 10 years ago.

Mary's husband Mark doesn't have Parkinson's, but he attends classes along with Mary to participate, as well as to help out with other people in the class.

"You have people who can hardly move when they get in there. But then when they go through class, it's like they escape from the reality that they have Parkinson's," said Mark. "I've never seen anything like it."

Swartz has experienced similar results. He was diagnosed with Parkinson's disease 14 years ago, but he's only been taking the classes for a little over a year.

"I've always worked out," said Swartz, "but since taking the classes, my physical condition is better, my coordination is better, and my boxing is a lot better."

Swartz says that if you have Parkinson's, staying in shape is not optional.

"Everyone I know who stays fit does much better than they would have if they didn't stay fit," said Swartz. "You have to keep moving and fight this thing."

In fact, exercise is so critical that doctors have started recommending it to their Parkinson's patients – and in some cases, they have specifically recommended taking Rock Steady Boxing classes.

"A Parkinson's doc at the Cleveland Clinic in Florida told us that the best thing you can do to keep going is to have a great attitude and exercise," said Mark Goldfarb. "It's a prescription that we fill with Colleen and her gym three to four times a week."

The classes at Beyond Fitness are led by the powerful duo of Sturgess and Morgana Rothbard, a physical therapy and rehab specialist.

"Not only do they have a master teacher in Colleen," said Rothbard, "They also have a master body therapist in every class. I'm there helping with alignment, helping people stand up tall, adjusting your feet, and in general helping you get full movement out of the exercise."

It's a pairing that sets Beyond Fitness apart.

"Our students come from all over the states," said Rothbard. "And they all say that our classes aren't like anything they've experienced before. I've witnessed in our classes people getting out of their wheelchairs and walking. It's a real gift that we have here."



Beyond Boxing

As the name itself implies, Beyond Fitness provides much more than exercise classes. Sturgess offers a support group once a month, where individuals learn what foods to eat (like vegetables, beans, and greens) and what foods to avoid (like nightshade vegetables, caffeine, and meat), and are also given information on avoiding pesticides, preservatives, and chemicals.

This is especially important in Parkinson's disease because, as Sturgess explained, only **10%** of Parkinson's is genetic, which means that **90%** is due to other environmental factors.

In addition, Beyond Fitness offers one-on-one sessions with Rothbard, who also serves as the gym's nutritional counselor. Rothbard believes that proper diet and supplementation help produce the best possible results. And while she carefully tailors dietary and supplementation programs to each individual, there are a handful of nutrients that stand out. These include zinc, glucosamine and chondroitin, omegas, coenzyme Q10, B vitamins, and amino acids, to name a few.

"Parkinson's is a breakdown of the nervous system and the nerves," said Rothbard. "We're helping people rebuild their body, so I recommend nutrients that are going to rebuild muscle tissue and help the synapses in their brain connect."

Melatonin is high on her list as well.

"Many of these individuals suffer from depression and don't sleep. Melatonin will help them get deep sleep so their body can rejuvenate," said Rothbard.

Sturgess, herself, takes numerous supplements to help support her overall health, including pro-

biotics, MSM (methylsulfonylmethane), holy basil leaf, calcium, flaxseed oil, and various Ayurvedic herbs.

Beyond Limitations

Ultimately, Sturgess's goal is to look beyond her clients' limitations, and to inspire everyone who walks through the door. It's a mission her clients especially appreciate about her.

"I wish you could bottle Colleen's ingredients. I've never met anyone with such passion for people," said Mark.

And that really strikes at the heart of what Beyond Fitness is all about. Because while the classes themselves might produce the bulk of the physical benefits, the secret ingredient is in the relationships that are formed. The participants have a camaraderie with which only those doing battle together in the trenches can identify.

"When you're with people going through the same thing, you don't feel like you're all alone going through this terrible condition," said Mary.

"When they're given a diagnosis that has no cure, these classes give them hope," said Sturgess. "They're fighting for their lives and cheering each other on. It's inspiring." ●

* *Phys Ther.* 2011 Jan;91(1):132-42.

Colleen Sturgess has a degree in Exercise Science and Health Promotion from Florida Atlantic University. She worked as a personal trainer for 14 years before opening Beyond Fitness gym in 2016.

To contact Beyond Fitness, call 561-441-4444 or visit www.beyondfitnessdelray.com. To find a Rock Steady Boxing class near you, visit www.rocksteadyboxing.org.

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- 00658 7-Keto® DHEA Metabolite • 25 mg, 100 capsules
- 01479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
- 01509 Advanced Anti-Adipocyte Formula
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 01823 CalReduce Selective Fat Binder
- 01478 DHEA Complete
- 01738 Garcinia HCA
- 29754 HCAActive Garcinia Cambogia Extract
- 01292 Integra-Lean®
- 01908 Mediterranean Trim with Sinetrol™ -XPur
- 01492 Optimized Irvingia with Phase 3™ Calorie Control Complex
- 01432 Optimized Saffron with Satiereal®
- 00818 Super CLA Blend with Sesame Lignans
- 01902 Waist-Line Control™
- 02151 Wellness Code Appetite Control

WOMEN'S HEALTH

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



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