

Striking Decline in Dementia Prevalence

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Dr. Satchin Panda, author of *The Circadian Code*, explains that with some lifestyle modifications, you can restore balance to your circadian rhythm and reap long-term rewards in better sleep, greater health, and reduced risk of disease.



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BY WILLIAM FALOON

Win the War Against Brain Aging

The overall number of Americans afflicted with **dementia** is expected to **triple** over the next 30 years.¹

The **percentage** of Americans that lose their **functional independence**, however, is sharply **declining**.

Whether you become a **victim** has a lot to do with **health behavior patterns** you engage in today.

People who take steps to protect against heart disease also reduce their risk of **memory loss, vascular dementia, and Alzheimer's**.²

This is incredible news for those who once believed aging persons were condemned to persistent cognitive decline.

Each year, large numbers of the elderly are needlessly **losing their minds** because of unhealthy lifestyles and failure to treat disorders like **hypertension** and **diabetes**.

This article describes how people today are benefiting from **preventive health** strategies they began decades ago. An exciting new finding reveals how **cognitive function** can be restored in persons over age 64.



While Overall Rates of Dementia are Soaring There is a Huge Decline in Dementia Prevalence

Four Published Studies Reveal:

- 20% per decade** decline in **dementia** prevalence (1977-2008)¹
- 24%** decline in expected British **dementia** cases (1991-2011)²
- 42%** decline in **dementia** prevalence in Americans (1982-1999)³
- 24%** decline in **dementia** prevalence in Americans (2000-2012)⁴

Dementia
Decline



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1. "Incidence of Dementia over Three Decades in the Framingham Heart Study." *N Engl J Med*. 2016;374(6):523-532. PMID: 26863354.
2. "A two-decade comparison of prevalence of dementia in individuals aged 65 years and older from three geographical areas of England: results of the Cognitive Function and Ageing Study I and II." *Lancet*. 2013;382(9902):1405-1412. PMID: 23871492.
3. "Declining prevalence of dementia in the U.S. elderly population." *Adv Gerontol*. 2005;16:30-37. PMID: 16075674.
4. "A Comparison of the Prevalence of Dementia in the United States in 2000 and 2012." *JAMA Intern Med*. 2017;177(1):51-58. PMID: 27893041.

The term **dementia** is defined as a decline in cognitive abilities that leads to a loss of **independent function**.

An estimated **4-5 million** older adults in the United States suffer dementia.³ This number is expected to **triple** in about 30 years.¹

Not all population groups are equally encountering loss of cognitive abilities with age.

A number of published studies suggest that the age-specific risk of dementia has declined in certain population groups over the past 40 years.^{4,5}

Dementia risk plummets in response to increasing levels of **education**, along with better control of **cardiovascular** risk factors, such as **hypertension**, **diabetes**, and high **cholesterol**.^{6,7}

In the famous **Framingham Heart Study**, the incidence of dementia among older Americans declined by about **20% per decade** between **1977** and **2008**.⁴

A British study found a **24% decline** in the expected number of cases of **dementia** between **1991** and **2011** among older adults.⁸ This translates to more than **200,000** fewer cases of dementia in England.

What's Behind the Dementia Decline?

Over the past several decades, there have been massive changes in how **vascular risk** factors are managed. This has translated into a remarkable **50% decrease** in deaths from **cardiovascular diseases** in the period of **1980** to **2014**.⁹

Steps that people take to reduce their **heart attack** risk also benefit their **brains** in ways that protect against **dementia**.

These preventative strategies might even offset some of the adverse impact of unhealthy lifestyles, such as excess calorie intake.

Vascular Disease Treatments Reduce Dementia Risk

In **1990** about **23%** of American adults were **obese**.¹⁰ By **2012**, obesity prevalence jumped to **35%** in adults.¹¹

For adults over age 64, this increase in body mass corresponded with surging rates of **type II diabetes**. Between **1990** and **2012**, type II diabetes prevalence increased from **9%** to **21%**.⁷ Diabetes is a risk factor for **dementia**.^{12,13}

But what also happened was an increase in **intensity** of treatment for diabetes, hypertension, and high cholesterol. This resulted in more obese people achieving their treatment goals. It also led to a decline in **vascular complications** of diabetes, such as heart attack, stroke, and amputation.¹⁴

The interventions used to maintain healthy blood flow help explain the large declines in vascular-related **dementia** that have occurred in recent decades.⁴



Huge Decline in Dementia Prevalence

Reasons for Less Dementia

- Advances in general education levels
- Reduced tobacco use
- Better control of **cardiovascular risk factors**

Dementia Decline



Reference:
"What's the 'Take Home' from Research on Dementia Trends?" *PLoS Med.* 2017;14(3):e1002236. PMID: 28267775.



Overlooked Dementia Reduction Factors

Healthier lifestyles patterns beginning in 1980s:

- Increased supplement use¹
- Bioidentical hormones^{2,3}
- Improved dietary patterns

Dementia Decline



Reference:

1. <https://www.cdc.gov/nchs/data/databriefs/db61.pdf>
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Education Level Affects Dementia Risk

Consistent findings show that **higher-educated** people suffer less **dementia**.¹⁵

The number of Americans aged 65 or older with a **high school diploma** increased from **53%** (in 1990) to **80%** (in 2010). Americans with a **college degree** increased from **11%** to **23%** over this same period.⁷

Several reasons explain why more **education** reduces dementia risk. One is a direct effect on brain development in early years and lifelong education that builds a "**cognitive reserve**" of functional neurons.

Healthier lifestyle behaviors and access to better medical care are advantages **higher educated** people enjoy.¹⁶⁻¹⁸ This includes readers of *Life Extension Magazine*® who are a highly-motivated group of **health-conscious** individuals.

The differences in food choices, supplement use, and preventive medical care between **higher-educated** individuals compared to **lower-educated** grows more disparate over time.

This can be seen in geographic regions of the United States whose populations suffer from high rates of obesity, tobacco use, untreated diabetes, and shorter life spans.

Dementia Risk in Years 2000-2012

A study published in the *Journal of the American Medical Association* (2017) sought to identify specific factors related to the decline in the prevalence of **dementia** that is occurring in the United States.

This study found that people evaluated in year **2012** had more years of **education** compared with the group studied in **2000**.⁷

The **2012** group also had **higher** rates of self-reported cardiovascular risk factors, including obesity, diabetes, hypertension, and heart disease.⁷

One might think these **higher** rates of **vascular risk** factors would translate into **higher** rates of **dementia**, but that's not what happened.

Instead, **dementia prevalence** in persons over **age 64** declined between years **2000** to **2012**. After adjusting for differences across the study groups, prevalence of dementia dropped **24%** during this twelve-year period.⁷

Factors That Reduced Dementia Risk

In this large nationally representative survey of Americans over **age 64**, published by the **American Medical Association**, the prevalence of **dementia** dropped from **11.6%** (in 2000) to **8.8%** (in 2012).⁷

AS WE SEE IT

Two factors associated with this **dementia decline** were an **increase** in **educational** attainment and **better** control of **cardiovascular** risks (such as hypertension).

Prevalence of **obesity** and **diabetes** in these study subjects increased significantly between **2000** and **2012**. Diabetes is associated with **higher** odds of dementia. Later-life **obesity**, on the other hand, seemed associated with cognitive advantages.^{7,19-21}

There was an overall trend toward declining **dementia risk** even as **diabetes** incidence surged. This suggests that improvements in diabetic **treatments** between 2000 and 2012 may have **decreased dementia** risk.

These findings are consistent with the declining dementia prevalence found since **1980** in the **Framingham Heart Study**⁴ and the dementia decline between **1991-2011** in the **Cognitive Function and Ageing Study** in England.⁸

Both of these large studies pointed to **increases** in **education** and better **control** of **cardiovascular** risk factors as likely contributors to declines in dementia incidence.^{4,8}

Conclusions from The JAMA Study

The authors of the 2017 study published in **JAMA*** concluded that they found a “...**significant decline in dementia prevalence among older US adults between 2000 and 2012...**”⁷

While they identified several correlations such as increased education levels, they made it clear that “...**the full set of social, behavioral, and medical factors contributing to the decline in dementia prevalence is still uncertain.**”⁷

*Journal of the American Medical Association



Life Extension[®] concurs that the reasons for the sharp declines in dementia incidences have **not** yet been fully accounted for.

Several factors not measured in the **JAMA** study relate to increases in **healthy behavior patterns** amongst **educated** people. This includes avoiding toxic foods, replacing hormones lost to aging, and the surging use of neuro-protective **nutritional supplements** over this same time period.

Consistent Findings Document Sharp Drops in Dementia

This **JAMA** analysis and others showing similar **declines** in **dementia** prevalence rates were reviewed in an article published in **2017** by **PLOS Medicine**.

This **PLOS Medicine** review opened up with data showing an astounding **42% decline** in prevalence of severe **cognitive impairment** in Americans from **1982** to **1999**.²² Similar **declines** in **dementia** prevalence were noted in data gathered in **England, Stockholm, and Rotterdam** around these same time periods.⁶

The **PLOS Medicine** authors then cited a **Dutch** study that found **no declines** in dementia prevalence rates amongst elderly persons and even indicators of a small increase.²³

One explanation given for this discrepancy was changes in medical record **coding** practices during the time period of this Dutch study. This caused more Dutch people to fall into the dementia diagnostic category, and hence increased the incidence of dementia in elderly persons.

They point out how these kinds of statistical discrepancies can skew data in ways that yield inconsistent findings amongst different studies.

The **PLOS Medicine** authors then point to evidence suggesting **increasing dementia** prevalence in **East Asia**, particularly in **China**. This is consistent with **worsening cardiovascular risk** profiles in many Asian countries, including rising rates of smoking, obesity, and metabolic disease.²²

Asians face epidemics of metabolic disorders relating to their ingesting a higher proportion of toxic Western foods.

Controlling the Dementia Epidemic

The *PLOS Medicine* authors make it clear that we must prepare for increased overall numbers of people with **dementia** as the population ages.

That said, the *PLOS Medicine* authors describe “*substantial evidence*” that supports the following protective factors against risk of late-life dementia:

- Advances in general **education** levels (especially in early life);
- Socio-economic well-being, and most importantly;
- Better control of **cardiovascular risk** factors (especially in mid-life).

Emphasis was placed on controlling **diabetes** and **hypertension** while reducing smoking and obesity. The following is an excerpt of the author’s concluding remarks:

“Dementia prevention should drive public health campaigns around beneficial lifestyle practices such as healthy eating and habitual exercise.”²²

How This Applies to Readers of Life Extension Magazine®

Longtime readers of this publication have been urged to keep blood pressure, cholesterol, glucose, and other **cardiovascular risk** factors in low normal ranges.

We’ve published numerous articles linking impairments in vascular health with **cognitive impairment**.^{24,25}

Those who have followed **healthy lifestyle patterns** are reaping huge rewards by **winning the war** against degenerative **brain aging**.²⁶

While people of all ages can take steps to reduce dementia risk, many who led unhealthy lifestyles in their earlier years face greater risk of neurological impairments.

Fortunately, there are ways to help reverse mild cognitive impairment and even early-stage Alzheimer’s that were chronicled years ago in this magazine.^{24,27-30} Many of you follow these healthy lifestyles, along with natural hormone replenishment and proper use of supplements.

Restoring Lost Cognitive Functions

Back in the **1980s**, people seeking to boost **cognitive functions** supplemented with **lecithin** and **choline** nutrients that convert to **acetylcholine** in the brain.

Acetylcholine is a **neurotransmitter** that transmits *signals* from one neuron (brain cell) to another in the brain.

Neurotransmitters may be thought of as **messengers** of the brain. They originate naturally within our body and assist in delivering messages between our neurons.

Acetylcholine levels are regulated by an *enzyme* called **acetylcholinesterase**. An efficient way to boost **acetylcholine** in the brain is to reduce activity of the *enzyme* (acetylcholinesterase) that degrades this vital neurotransmitter (acetylcholine).

In normal brains, a proper balance of **acetylcholine** and **acetylcholinesterase** optimizes cognitive function.

In some cases of neurodegeneration, acetylcholinesterase *activity* can increase in the vicinity of the brain dealing with hallmarks of Alzheimer’s (**amyloid plaques** and **neurofibrillary tangles**).

Furthermore, an increase in an **inactive** form of **acetylcholinesterase** may increase deposition of **amyloid plaque**.³¹



AS WE SEE IT

These findings suggest that inhibiting acetylcholinesterase can help protect against **structural** changes seen in Alzheimer's brains.³²

A Plant-Derived Acetylcholinesterase Inhibitor

A natural inhibitor of the **acetylcholinesterase enzyme** has been discovered in a novel extract from **sage**.

In a controlled study of people over age 64, this **sage extract** demonstrated a nearly:³³

- **60% increase** in long-term **memory** performance
- **2.5-fold improvement** in **accuracy of attention**

In addition to **rapid** enhancements in human cognitive performances, this particular **sage extract** extended average lifespan by **12%** in the *C. elegans* model.³⁴ This indicates additional beneficial mechanisms that are described in an article beginning on page 24 of this month's issue.

Sage extracts have recently become available as supplements for cognition support. Even some "generic" **sage extracts** have favorable *acetylcholinesterase*-modulating activities.^{35,36} However, they do not increase lifespan when tested by same assay technology in *C. elegans*.

Protect Your Brain Against Stroke

Newly published research reveals that people who make healthy lifestyle choices reduce their risk of neurodegenerative disorders.

Consistent with these findings are studies showing that higher intakes of **magnesium** may slash stroke risk by **41%**,³⁷ while people with higher blood levels of **CoQ10** suffer less brain damage if they to suffer a **stroke**.³⁸

Articles in this month's issue describe protective effects against **neurodegeneration** that readers of this publication have long enjoyed. It is regrettable that large segments of the public are unaware of these scientific findings.



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The studies described in this article validate how the healthy lifestyles many of you follow have resulted in huge declines in the percent of older Americans who will suffer the indignities of **dementia**.

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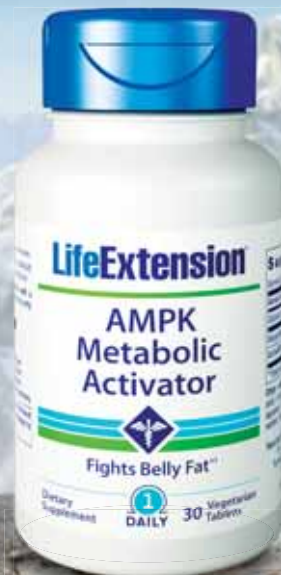
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Anti-Inflammatory Diet Tied to Reduced Mortality

Research has indicated that some foods are associated with an increase in systemic inflammation while others have anti-inflammatory effects.

A study published in the *Journal of Internal Medicine* utilized data from a large cohort of subjects followed for 16 years.* A validated anti-inflammatory diet index was used to quantify the impact of subjects' diets on inflammation.

Over 16,000 deaths occurred in the cohort over the study period and mortality rates and survival were correlated with the diet index scores.

Individuals whose diets contained the least inflammation-provoking foods were found to have **18%** lower all-cause, **20%** lower cardiovascular-related, and **13%** lower cancer-related mortality. Amongst current smokers, diet had an even greater impact, with **31%**, **36%**, and **22%** lower risk of death, respectively.

Editor's Note: Chronic inflammation is known to contribute to aging and age-related disease. A diet that minimizes inflammation can potentially slow the aging process and reduce risk for cardiovascular disease, cancer, and death by any cause. Following a healthy Mediterranean style eating pattern provides foods that have anti-inflammatory effects. This includes avoiding foods cooked at high temperature, something that Life Extension® has advocated for since 2003.

* *J Intern Med.* 2018 Sept 12.

Vitamin D May Protect Against Heart Failure

Recent research suggests a role for **vitamin D** against the scarring and thickening of the heart muscle after a heart attack, which can lead to heart failure.*

When blood supply to the heart is blocked during a heart attack, **cardiac colony-forming unit fibroblasts** replace damaged tissue with collagen-based scar tissue. "This is a problem because scarring of heart tissue can reduce the heart's ability to pump blood effectively," lead researcher James J. H. Chong explained.

Using cardiac colony-forming unit fibroblasts (cCFU-Fs) taken from mouse hearts, Dr. Chong's team studied the effects of vitamin D3 on cell proliferation and differentiation.

"Our research shows that vitamin D actually blocks the cCFU-Fs from forming scar tissue," Dr. Chong reported. "By blocking cCFU-Fs, vitamin D may play an important role in lowering the risk of heart failure after a heart attack."

Editor's Note: "With further study, vitamin D could prove to be an exciting, low-cost addition to current treatments, and we hope to progress these findings into clinical trials for humans," Dr. Chong concluded.

* *Heart Lung Circ.* 2018;27(8):967-975.

Probiotics Good for the Liver Too

A presentation at the American Society for Investigative Pathology annual conference, held during the 2018 Experimental Biology meeting, revealed a liver-protective effect for **probiotic supplementation** in experimental research.*

Probiotics are beneficial bacteria that help support a healthy bacterial population in the gut and have been found to have benefits elsewhere in the body.

In the current study, the research team gave mice diets supplemented with the probiotic *Lactobacillus rhamnosus GG* for two weeks followed by a high dose of acetaminophen, which can be toxic to the liver. Acetaminophen causes liver damage by increasing the formation of free radicals.

Mice that received the probiotic had less liver damage than those that received unsupplemented diets. "Administration of the probiotic LGG to mice improves the response of the liver, protecting it from oxidative damage produced by drugs such as acetaminophen," explained researcher Bejan Saeedi.

Editor's Note: "As the primary metabolic and detoxification hub, the liver is a critical checkpoint between the digestive functions of the gut and the rest of the body," write Dr. Saeedi and colleagues at Emory University in their summary of the findings. "Therefore, it is likely that liver health and homeostasis may be affected through alterations in the gut microbiota."

* American Society for Investigative Pathology Annual Meeting. 2018 April 21-25

Cruciferous Vegetable Intake Benefits Carotid Arteries

A human study suggests a protective effect for **cruciferous vegetables** against increased carotid artery wall thickness, a measure of atherosclerosis.*

The study included 954 women aged 70 years and older. Dietary questionnaires ascertained type and frequency of vegetable consumption. Sonograms measured carotid artery wall thickness and carotid plaque severity.

Among subjects whose total intake of vegetables was classified as high, carotid artery wall thickness averaged **0.05 mm** less than subjects whose intake was low.

"This is likely to be clinically significant because a **0.1 mm** decrease in carotid IMT [intima medical thickness] is associated with a **10% to 18%** decrease in risk of myocardial infarction and stroke," lead researcher Lauren Blekkenhorst of the University of Western Australia commented.

For each **10 gram**-per-day increase in cruciferous vegetable intake, average carotid wall thickness was **0.8%** lower.

Editor's Note: Cruciferous vegetables, which include broccoli and kale, have been associated with many health benefits, including protection against some cancers.

* *J Am Heart Assoc.* 2018;7(8):e008391.



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

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

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Restore Youthful **Cognitive** Function

A close-up photograph of sage leaves, showing their characteristic serrated edges and textured surface. The leaves are a vibrant green color and are arranged in a dense cluster. The background is slightly blurred, emphasizing the texture of the leaves.

BY HARRY FULTON

Starting around age **30**, we begin to notice short-term **memory** deficits.

This may happen when *after* taking a drug, we have no immediate recall if we actually swallowed the pill.

As people advance past **60** years, they often rely on “**pill organizers**” to ensure medications are taken on schedule.

Short-term **memory** decline is a troubling aspect of brain aging.

A clinical study evaluated a standardized **sage extract** compared to **placebo** in adults over **age 64**.¹

Within hours of ingesting this **sage** extract, **memory performance** increased nearly **60%**, along with an approximate **2.5-fold improvement** in **attention**.

When this **sage extract** was tested in the *C. elegans* model of aging, there was a **12% increase** in lifespan,² attributable in part to increased expression of insulin signaling genes that have been tied to enhanced longevity.³

Meticulous research has now identified how this **sage extract** enhances **cognitive function** in humans and increases **lifespan** in a validated model of aging.

Sage Extracts Protect the Brain

Age-related mental decline, including **mild cognitive impairment**, is a normal part of brain aging.

Many factors lead to dwindling cognitive functions.

Readers of this magazine take steps to circumvent mind-robbing pathologies, such as maintaining cerebral **circulation** and keeping **homocysteine** in safe ranges.

Clinical data on a novel **sage extract** indicates additional protective effects.⁴

Role of Acetylcholine on Short-Term Memory

Neurotransmitters are compounds brain cells use to communicate with one another.

Acetylcholine is a neurotransmitter critical for memory, attention, and reasoning. With aging and neurodegenerative disorders, acetylcholine levels can be depleted.⁴

This decrease in acetylcholine is responsible for many age-related deficits, including poor memory and the inability to pay attention to tasks.⁵

Currently available drugs can improve dementia symptoms by boosting brain levels of **acetylcholine**. This has been demonstrated to reduce the cognitive deficits in the short term.^{6,7}

In a recent review of several trials in Alzheimer's patients, treatments that boost acetylcholine are associated with more than **20% lower** overall mortality.⁷

These treatments work to increase **acetylcholine** in the brain by blocking activity of an *enzyme* that degrades it. This *enzyme* is called **acetylcholinesterase**.

Sage extracts inhibit this same *enzyme* and boost **acetylcholine** levels. Significant improvements in cognitive functions have been demonstrated in **human** studies.^{1,8-11}

Growing New Brain Cells

Neurotrophins are proteins produced in the body that help maintain brain function. They support survival of brain cells and encourage **neurogenesis**, a process that replenishes and repairs brain cells.¹²

Normal aging leads to lower neurotrophins levels, which is implicated in the progression of cognitive impairment and Alzheimer's disease.¹³

Sage helps to support healthy levels of **neurotrophins**, boosting their levels even in the presence of cellular stress and injury.¹⁰

The ability of **sage extract** to support **neurotrophins** can help protect against future loss of functionality and dementia.

Oxidative Stress and Inflammation

Most age-related diseases are at least partially tied to **oxidative stress** and **inflammation**. Age-related deterioration of brain function is no exception.

Sage contains compounds that scavenge harmful free radicals and reduce the deleterious effects of inflammation.¹⁰

In a rat model of diabetes, one study showed that **sage** limited oxidative damage and boosted oxidant-reducing defense systems. This resulted in reversal of learning and memory deficits.¹⁴

Initial Human Studies

Sage extracts were tested in a series of trials in younger people.^{8,9,15,16}

In each of these trials, scientists found that sage induced beneficial effects on mood and cognition.

Within hours of consuming the sage supplements, these younger subjects benefited from improved mood, reduced anxiety, enhanced long-term memory/attention, and reduced mental fatigue.

Sage extracts have also been studied in older individuals with Alzheimer's disease.^{11,17} In a preliminary study of Alzheimer's patients, **sage extract** improved neuropsychiatric symptoms and attention.¹¹



In a randomized clinical trial of patients with mild-to-moderate Alzheimer's dementia, one arm of the study received a **sage extract** and the other a **placebo**.¹⁷ The researchers used a scoring system designed to evaluate cognitive functions in Alzheimer's patients.

Results of this study showed that over the course of four months, **cognitive scores** of people who received **placebo** deteriorated by about **22%**. The study subjects supplemented with **sage extract** improved by about **26%**.

Considering that these people presented with clinical indicators of mild-to-moderate dementia, the improvement seen after **four months** in the **sage supplemented** group is quite remarkable.

New Standardized Sage Extract

Findings from the **human** studies described thus far led to a search for compounds in **sage** responsible for these improvements in cognitive function.

An intensive investigation using advanced analytic techniques identified a sage plant that has **superior biological activity**.²

The result of this research is a standardized **sage extract** that has demonstrated improved mechanistic properties in microarray gene expression studies.³

To test this new **sage extract** in the real world, a rigorous study of cognition in aging humans was conducted.

Enhancement of Cognition in Aging Humans

Using this standardized **sage extract**, a clinical study evaluated the effect on cognition in adults over age 64.¹

The subjects underwent a battery of **brain function** tests before and after receiving this novel **sage extract** or **placebo**.

Here are the results:

- Compared with placebo, **memory performance** in people receiving the **sage extract** was boosted by roughly **60%**.
- Compared to placebo, measures of **attention** were enhanced approximately **2.5-fold** in **sage-supplemented** subjects.
- These effects occurred rapidly, improving brain function *within hours* of intake of this new **sage extract**.



Preserving Cognitive Function

- Sage has been recognized for its numerous health benefits for centuries.
- Numerous beneficial compounds in sage enhance and protect brain function by several complementary mechanisms.
- Low levels of the neurotransmitter acetylcholine are associated with age-related cognitive dysfunction and dementia. Like medications used to treat dementia, sage boosts levels of this important neurotransmitter in the brain.
- A proprietary sage extract with unique properties that have not been identified in other sage formulations¹⁸ has demonstrated beneficial effects on cognitive performance and cerebral blood flow in humans, as well as boosting longevity related genes in a *C. elegans* animal model.
- Sage can work together with other brain healthy nutrients to maximize brain function and prevent age-related cognitive decline.

Cognitive function tends to decrease over the course of a day, resulting in worsening memory performance and accuracy of attention. Supplementation with **sage extract** enhanced both of these aspects of brain function in these subjects.

Potential Lifespan Increase

Pathologic aging is partially characterized by disruption of **genes** involved in **insulin signaling** and **lipid metabolism**.

These effects are revealed in **blood tests** showing increases in **glucose**, **cholesterol**, and **triglycerides** as people grow older.

In a laboratory model of aging, this new **sage extract** was studied on the *C. elegans* roundworm. This kind of testing is used to identify the impact of compounds on human longevity potential.²

Boosting Brain Performance

Acetylcholine is one of the most common neurotransmitters and its functions are critical for normal cognition, including memory, attention, and reasoning.

Unfortunately, acetylcholine is one of the hardest hit in aging and Alzheimer's disease.⁴ Brain cells that use acetylcholine are some of the most profoundly affected.

Most modern medical treatments for dementia attempt to improve symptoms by boosting levels of acetylcholine, which has demonstrated the ability to reduce the cognitive deficits and enhance brain function in the short term.^{6,7}

These drugs *increase* levels of acetylcholine by *blocking* the activity of the enzyme that degrades it, called **acetylcholinesterase**.

Many studies have now confirmed that **sage** also exhibits this ability, boosting levels of acetylcholine in addition to all of its preventative properties.^{1,3,8-11}

This may explain why **sage** can cause almost immediate augmentation of brain function.

Pharmaceutical approaches to treating dementia mostly address acetylcholine. The multiple mechanisms of **sage** in the brain can help boost current cognitive function as well as prevent future progression of age-related dysfunction.

This particular **sage extract** was found to increase expression of **lipid** metabolism and **insulin** signaling **genes**, which have been tied to enhanced longevity.³

The result was a **12%** lifespan increase in *C. elegans* that were fed this novel **sage extract**. Other sources of sage tested did not demonstrate extended life.²

Improved Neurotransmitter Signaling

As it relates to short-term memory loss, acetylcholine is one of the most studied neurotransmitters in the aging brain. By inhibiting the *enzyme* that degrades acetylcholine, extracts from sage have consistently been shown to improve cognitive performance.

In addition to **acetylcholine**, several other neurotransmitters are adversely affected by aging.

This novel sage extract has been shown to favorably modulate gene expression of other neurotransmitters crucial for cognitive function, such as GABA and glutamate.³

These findings explain the profound benefits observed in human studies that extend beyond boosting acetylcholine brain levels.

Improved Blood Flow to the Brain

Aging is associated with a reduction of blood flow to the brain, which contributes to adverse changes in cognitive function.²⁰

A significant body of evidence points to diminished cerebral circulation as a precursor to both vascular and Alzheimer's dementia.



As we reported in the **March 2014** issue of this magazine, **loss of blood flow** to the brain is a greater problem than most people realize. Here is one quote from what we published:²¹

“According to a study conducted at the Mayo Clinic, a surprising number of aging people suffer a condition in which tiny areas of their brain become oxygen deprived. This cerebral vascular deficit sharply increases risk of stroke, dementia, and cognitive impairment. Healthy lifestyle choices can prevent and may help reverse it.”²²

This **new sage extract** may guard against this circulatory reduction as it has been found to have vasodilator properties, opening blood vessels that supply the brain.³

Summary

The herb **sage** is uniquely suited to protecting brain function from deterioration associated with aging and dementia by several complementary mechanisms.

It also augments current cognitive function by enhancing levels of the neurotransmitter acetylcholine in the brain.

Scientists in England identified a proprietary standardized sage extract that protects and enhances cognitive function.

This extract has been found to have a unique chemical makeup¹⁸ and additional biological effects not previously identified in other sage preparations.²

This **new sage extract** has uniquely demonstrated the ability to extend lifespan in laboratory models and to improve cognition in elderly human subjects.

Coupled with other nutrients such as phosphatidylserine, blueberry, vinpocetine, and others, sage can be an important component of a comprehensive formula for the brain. ●

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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(References on page 31)



Measuring Superior Biological Activity

Intensive chemical analysis of this novel **sage extract** demonstrates that it has a **unique chemical fingerprint** compared to other sources of sage.¹⁸

Furthermore, this proprietary sage extract has **superior biological activity** compared with other sage sources and cognitive drugs when tested by **Chronoscreen™** assay in *C. elegans*.^{2,19}

Chronoscreen™ is a patented technology that can evaluate the effect of nutrients and drugs on lifespan in a whole organism.

Life Extension has closely collaborated with scientists at a group called **Sibelius** to uncover the specific mechanisms of action of this proprietary sage extract. The goal has been to more precisely identify how this particular sage extract enhances memory and attention in humans.

This Chronoscreen™ assay revealed the surprising finding of a **12% lifespan increase** in the *C. elegans* model, an effect not found with other sage extracts.²

Complementary Nutrients for Brain Health

While **sage** provides protection and enhancement of brain health by several means, there are other nutrients which can help maximize nervous system function, complementing the action of sage extract.

Phosphatidylserine

Phosphatidylserine is a **phospholipid**, one of the structural components of the membranes that surrounds all cells in the body. This is particularly critical for nerve cells in the brain because it is their cell membrane that carries nerve impulses throughout the nervous system.²³ The **myelin** that surrounds nerve fibers and aids signal conduction also relies on phosphatidylserine for normal structure and function.

Aging is associated with structural deterioration in the nervous system, which may be reduced by phosphatidylserine, preserving cognitive function.

Phosphatidylserine is particularly notable as a brain health supplement in that it is the only supplement that has been given “qualified health claim” status for its potential to reduce the risk of cognitive decline and dementia in the elderly by the U.S. Food and Drug Administration.²⁴

Blueberry

Blueberries are packed full of **anthocyanins**, powerful oxidant-reducing compounds that help protect the plant from oxidative stress. These compounds have been explored in the medical literature for years for their potential health benefits to humans.

Several recent trials in humans have demonstrated that enhancement of cognitive function can be added to the list of blueberry’s benefits. Not only has blueberry been found to enhance memory and other cognitive performance in older subjects, it improves mood and cognition in children and young adults as well.²⁵⁻²⁹

Vinpocetine

Vinpocetine is a compound derived from the periwinkle plant.

It has been reported to have benefits for cognition and degenerative disorders of the brain such as Alzheimer’s and Parkinson’s disease due to multiple nervous system effects.³⁰ It acts as a dilator of blood vessels to the brain, improving blood flow, as well as stimulating brain metabolism.

Pregnenolone

Pregnenolone is a hormone and hormone-precursor. It and its derivatives formed in the brain have modulatory effects on nervous system function.

Several studies in animals and humans have reported beneficial effects for the brain.³¹ It appears to be a neuroprotectant, defending the brain from various forms of injury. It has also been found to have positive effects on mood, memory, and other aspects of cognition.

Ashwagandha

Ashwagandha is an Indian herb also referred to as “Indian Ginseng”. It has been used in traditional Indian medicine as a nerve tonic for millennia.

In modern research, ashwagandha has demonstrated neuroprotective effects and improvements in mood and cognition.^{32,33}

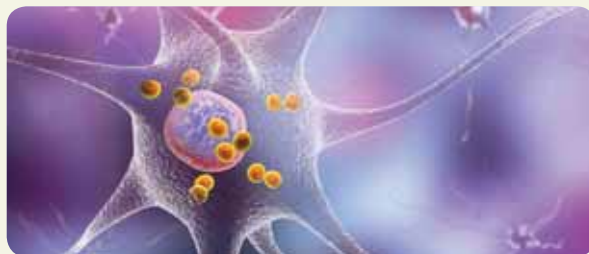
For example, a recent study in patients suffering from mild cognitive impairment found that ashwagandha led to improvements in memory and other markers of cognitive functioning such as attention and decision-making executive function.³²

Uridine 5'-monophosphate

Uridine 5'-monophosphate is a **nucleic acid**, a precursor necessary for the synthesis of RNA and proteins. In addition, it contributes to the production of components of **synapses**, the region where brain cells communicate with each other.³⁴

Loss of functional synapses contributes to the decline in brain function with age and various degenerative diseases. Therefore, by aiding nerve cell functions related to synapses uridine is believed to help preserve brain function and protect it from degeneration.³⁴

Readers of this magazine have been using some or all these nutrients for many decades to protect and enhance cognitive functionality.



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Mild Cognitive Impairment & Alzheimer's Disease

One of the most prevalent health concerns for the brain is age-related cognitive decline.

Early deterioration in brain function beyond that expected for one's age is referred to as **mild cognitive impairment**, affecting memory, attention, and other mental processes. **Dementia** refers to more severe loss of cognitive function. The most common cause of dementia by far is **Alzheimer's disease**. These two diagnoses are characterized by lower levels of acetylcholine.

Both of these disorders are very common, affecting millions of adults in the U.S. alone.

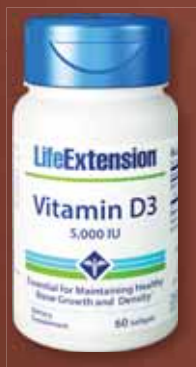


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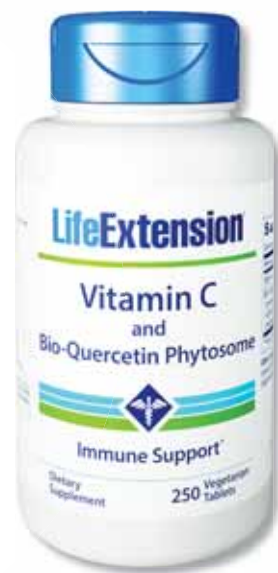
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MAGNESIUM

Brain and Bone Benefits



BY JUAN PABLO BUSTOS, MD

The mineral **magnesium** is involved in more than **300 enzymatic reactions** throughout the body.¹

Half the body's magnesium is stored in the **bones**, where it forms part of the skeletal matrix.

Magnesium helps **neurons** connect, is vital for normal **heart** rhythm, and helps regulate **blood pressure**.^{2,3}

Most Americans do not get enough magnesium from their **diet**.⁴⁻⁶

This article explains how magnesium can protect against age-related diseases, including reducing **stroke** risk.

Magnesium Is Critical for Health

Magnesium provides three important benefits:⁷⁻¹⁰

- **Facilitates cellular energy.** Magnesium is a critical element in the body's energy production process.⁷
- **Supports DNA synthesis and repair.** DNA abnormalities may lead to cancer and other diseases. Magnesium is necessary for DNA synthesis and repair.^{8,9,11}
- **Counters inflammation.** Low magnesium intake triggers activation and release of pro-inflammatory factors.¹⁰ Magnesium combats chronic, low-grade inflammation, which is a contributor to a wide range of age-related diseases.



Scientists are reconsidering the dietary recommendations for magnesium due to evidence showing that current guidelines might not supply an adequate amount of this crucial nutrient.¹²

Let's take a look at a few of the specific areas of the body protected by magnesium.

Bone Density

Magnesium plays an enormous role in bone health. About **half of the total body magnesium** is stored in the bones.^{3,13}

Magnesium is necessary for **bone remodeling**, the process by which old bone is broken down and new bone is formed.¹³

Blood levels of magnesium have an impact on **bone density**. A deficiency in dietary magnesium is associated with a decrease in bone mass and an increase in *pro-inflammatory cytokines*. This is a group of substances that cause inflammation and tissue damage, which can lead to **osteoporosis**.¹⁴

Low dietary magnesium levels may lead to decreased secretion of a *hormone* responsible for bone maintenance.¹⁴

Brain Health

Researchers at MIT discovered a special form of magnesium, called **magnesium L-threonate** that plays a key role in the way neurons connect and communicate with each other.

In a rat study, this special form of magnesium has been found to penetrate the blood-brain barrier, which led to improved learning abilities, working memory, and enhanced long- and short-term memory.¹⁵

Another study showed that when mice were given **magnesium L-threonate** in a solution prior to completing a maze test, they performed better than rats that did not receive the solution—a demonstration of improvement in short-term memory and other cognitive functions.¹⁶

And in a recent human study, supplementation with **1,500–2,000 mg** each day of **magnesium L-threonate** (depending on body weight) for 12 weeks showed:¹⁷

1. **Improved body magnesium status.** After 12 weeks, researchers found significant increases in red blood cell concentration and in urinary excretion of magnesium in the treated group.¹⁷

Increased urinary excretion indicates that large amounts of magnesium have been absorbed, while increased levels in red blood cells show high levels of magnesium in the body.



2. **Improved cognitive abilities.** Using a test of visual attention and task switching, researchers saw significant increases in performance speed for executive function and cognitive processing. These benefits appeared as early as week six on some of the tests.¹⁷ Most tellingly, the overall composite scores for all tests of the **magnesium L-threonate**-supplemented group increased significantly compared with baseline scores and with those of placebo recipients at weeks 6 and 12.
3. **Reduced fluctuation in cognitive ability.** Everyone experiences some days during which they aren't as alert or sharp as they'd like to be. Magnesium L-threonate has shown an ability to stabilize cognitive performance.^{18,19} In the present study, while placebo recipients showed considerable fluctuation in their cognitive scores, those in the magnesium L-threonate group had primarily positive changes.¹⁷

Magnesium Benefits

- Most Americans have inadequate **magnesium** intake, increasing their risk of cardiovascular disease, osteoporosis, type II diabetes, and more.
 - Magnesium plays a number of critical roles throughout the body and is a cofactor for more than **300 enzymatic reactions**.
 - Magnesium supplementation has been shown to improve memory, help control blood pressure, and reduce risk factors associated with metabolic syndrome.
 - Maintaining optimum magnesium levels is a key part of any anti-aging program.
4. **Reversal of clinical measures of brain aging.** Brains do not **functionally** age at the same rate as whole-body **chronological** age. For example, a **60-year-old** person can have a brain age of **70**, meaning they are **functioning** at an "older" level.¹⁷ This variance of brain aging is based on measurable performance and physiological parameters.²⁰⁻²³ In a **human** study, the average functional brain age of subjects receiving **magnesium L-threonate** supplements decreased from **69.6 years** at the start of the study to **60.6** after just six weeks of treatment.¹⁷

Cardiovascular Health

Magnesium plays several roles in heart health, including:

- Controlling blood pressure,
- Maintaining heart rhythm,
- Reducing the risk of atherosclerosis, and
- Combating metabolic syndrome.

Let's examine each of these key cardiovascular elements.

Blood pressure. Magnesium contributes to the dilation of blood vessels. This helps keep blood pressure under control.²⁴

Heart rhythm. Patients with low levels of magnesium are more susceptible to suffering from arrhythmias (irregular heartbeat).²⁵ Research shows that magnesium supplementation corrects low magnesium-related arrhythmias.^{26,27}

Magnesium supplementation is now routinely used *before* many kinds of heart surgeries that are known to induce postoperative arrhythmias and is also recommended for people with chronic arrhythmias who have low magnesium levels.²⁸⁻³²

Magnesium Supplements Vary

There is no single "optimal" form of magnesium for supplementation. Instead, it is important to consider the **reason** for the supplement.

One approach for ideal magnesium supplementation is to use a **2-part supplement** composed partly of *magnesium citrate* in a **quick-release form** and magnesium oxide in an **extended-release form**.

Magnesium oxide is highly concentrated, allowing a lot of magnesium to go into a relatively small pill. Because magnesium oxide is somewhat less bioavailable, it is ideal for an extended-release formulation, which gradually makes its way into the circulation.

Magnesium citrate, on the other hand, is less concentrated but is highly bioavailable, which allows for quick release of the mineral in a form that is readily absorbed.

This kind of innovative combination provides extended magnesium benefits in a single supplement.

For brain health, **magnesium L-threonate** has demonstrated the most impressive results.

Atherosclerosis. Endothelial dysfunction leads to thickening and stiffening of the arterial walls ("hardening of the arteries," or atherosclerosis).^{33,34} While arterial stiffening drives up blood pressure, magnesium supplementation lowers blood pressure, which in turn decreases the arterial resistance against which the heart must pump.

This is especially notable in the smaller arteries that provide blood flow to major organs.³⁵ Magnesium supplementation has been demonstrated to improve *endothelial* function.³⁶

Metabolic syndrome. This group of risk factors includes abdominal obesity, high blood sugar, lipid abnormalities, and high blood pressure. Together, these factors increase the risk of developing cardiovascular diseases such as heart attack and stroke.³⁷

Research shows that magnesium has potential as a **therapeutic agent** for reducing the incidence of *metabolic syndrome* and its cardiovascular complications. In a randomized, placebo-controlled study, oral supplementation with magnesium significantly improved metabolic syndrome risk factors compared to a placebo group.³⁸

Higher magnesium intake has been found to be associated with lower **stroke** risk. In fact, one study showed that men who were in the top **30%** of **magnesium intake** had a **41% reduction** in stroke risk.³⁹

Another study found that men with the **highest** levels of serum magnesium had **lower** rates of heart failure compared to men with the lowest serum magnesium.⁴⁰



Blood Sugar and Diabetes

Magnesium intake is associated with a decreased risk of developing diabetes.⁴¹

Studies show that type II diabetics have low blood levels of magnesium.^{42,43} This deficiency decreases sensitivity to insulin and causes the kidneys to excrete magnesium.⁴³ This creates a vicious circle that worsens blood sugar levels and diabetes complications.⁴⁴

Studies also show that magnesium supplementation can have a beneficial effect on blood sugar. In one study, subjects consumed a magnesium solution that delivered **637 mg** of magnesium. The result was significantly reduced insulin resistance, fasting blood sugar levels, and hemoglobin A1c (a measure of chronic exposure to high sugar).⁴⁵

A **2015** study evaluated the efficacy of a daily dose of **382 mg** of magnesium on 116 individuals aged 30 to 65 with prediabetes and low magnesium, taken for a period of four months.⁴⁶ At the end of the trial the researchers found an **11.6%** reduction in fasting glucose, an **8.8%** decrease in post-meal glucose, a **30.5%** decrease in insulin resistance scores, and a **26.7%** decrease in triglycerides.⁴⁶

Summary

Magnesium plays a vital role in many processes throughout the body. A deficiency of magnesium increases the risk of a host of chronic health problems.

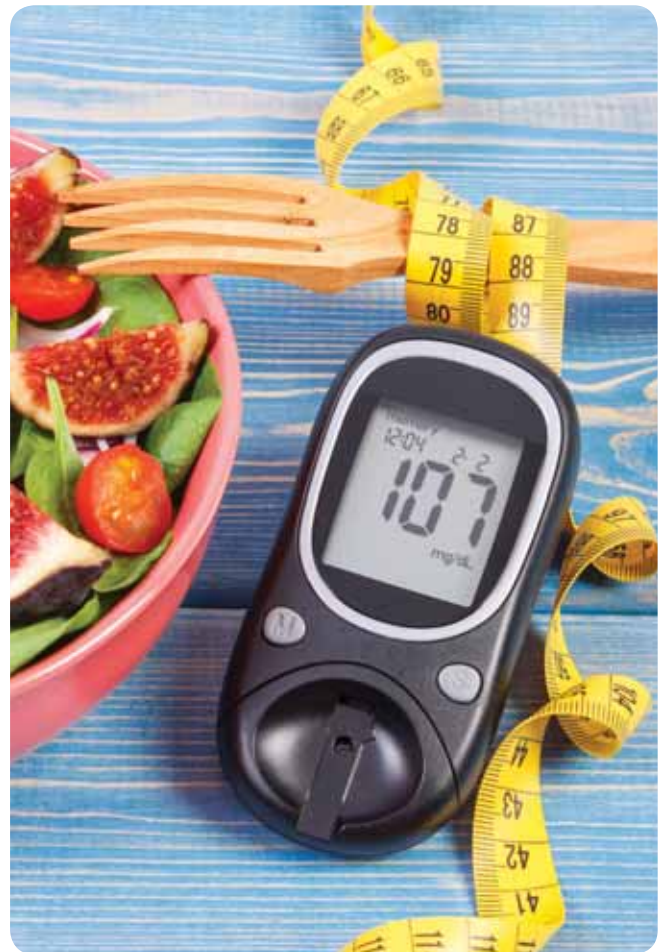
The majority of Americans do not consume adequate levels of this low-cost mineral.

Higher magnesium consumption, via diet or supplementation, has been demonstrated to provide numerous benefits, including improving cognitive function, helping to regulate blood sugar and reducing **stroke risk** as much as **41%**.³⁹ ●

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

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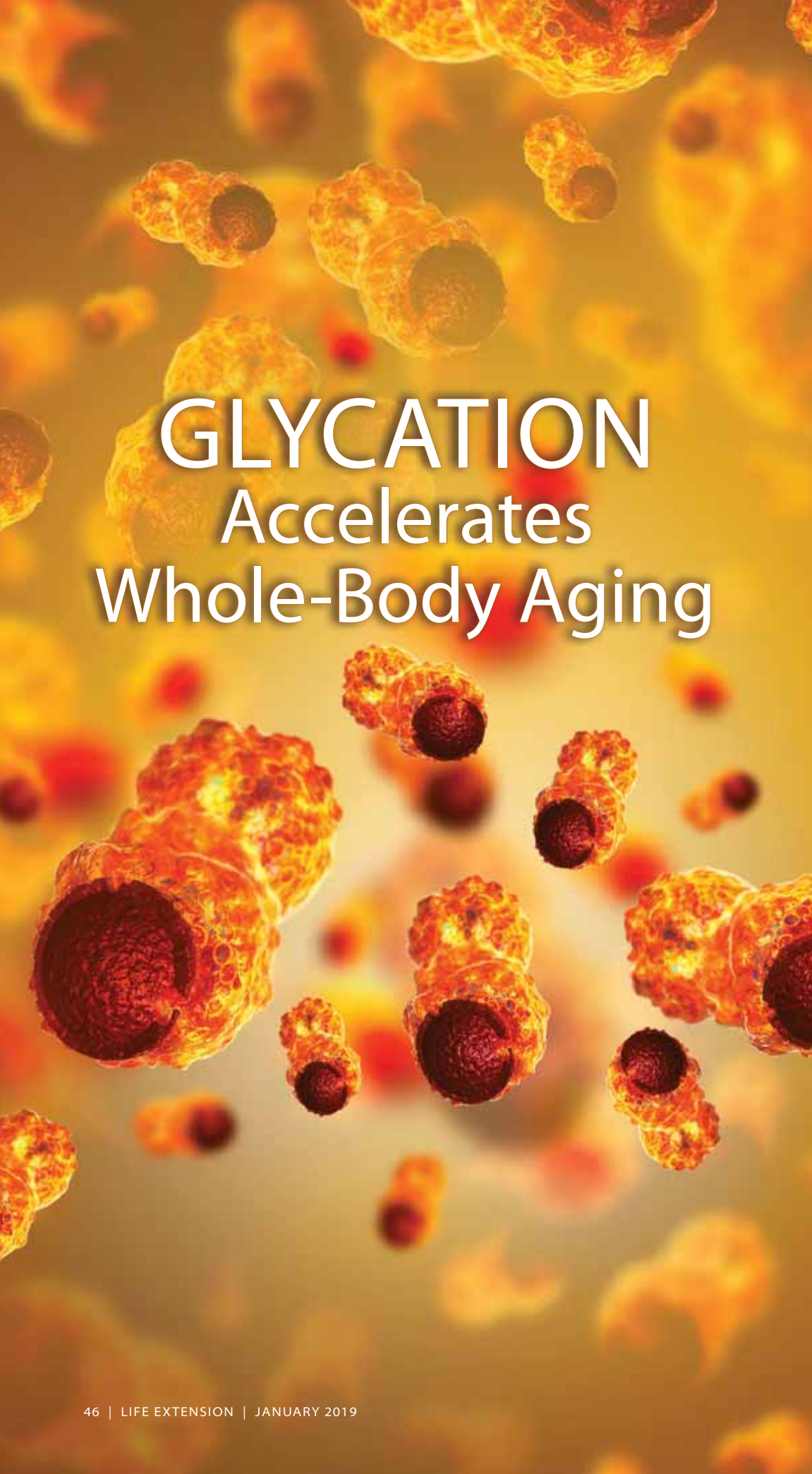
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A microscopic view of various cells, some appearing healthy and others with dark, irregular shapes on their surfaces, suggesting glycation. The background is a warm, golden-yellow color.

GLYCATION Accelerates Whole-Body Aging





BY AMY ROSEN

Diabetics suffer premature illnesses related to uncontrolled **blood sugar**.

A common diabetic complication happens when **glucose** binds to the body's **proteins** through a process called **glycation**.

The result is formation of **damaged structures** that are hallmarks of accelerated aging.

Glycation's effect on living tissue is similar to the process by which meat is browned when cooked at high temperatures. Our body's living proteins also turn brown in the presence of **excess glucose** and are rendered functionally impaired.

Glycation occurs in **all aging adults**, not just diabetics, and affects tissues **throughout the body**.

Fortunately, there are documented ways to help block and even **reverse** toxic **glycation** reactions in our bodies.

The Development of Glycation

Glucose in the body is a double-edged sword.

On one hand, glucose serves as a critical source of cellular energy.

On the other, the accumulation of glucose-derived (glycation) byproducts damages delicate cellular structures. The pathologic impact is chronic inflammation, premature diseases, and accelerated aging.¹⁻⁵

These harmful byproducts are called **advanced glycation end-products (AGEs)**. They accelerate aging in a number of ways including:⁶

- Interfering with the normal function of our body's proteins;
- Cross-linking proteins to cause tissue stiffening, skin-wrinkling, and impaired heart and blood vessel function;
- Inducing chronic inflammatory reactions;
- Making cells more susceptible to oxidative damage.

Glycation's Impact on Aging

Everyone is at risk for the age-accelerating effects of glycation. However, diabetics' tissues undergo rapid aging and deterioration due to poor glucose control.

The life expectancy of an individual whose diabetes is not adequately controlled is significantly shortened, and quality of life suffers from this accelerated aging process.⁷

In diabetics and non-diabetics, **glycation** has been implicated in disorders such as:^{2-6,8-13}

- Kidney failure,
- Alzheimer's and Parkinson's disease,
- Skin cancer,
- Arthritis,
- Spinal disease,
- Visual loss,
- Atherosclerosis, and
- Heart disease.

Glycation has been identified as an important contributor to atherosclerosis and direct damage to the heart muscle.^{6,9}



New human studies demonstrate that higher accumulations of **advanced glycation end-products (AGEs)** are associated with lower levels of physical activity and decreased reaction time.^{14,15}

The good news is that glycation, and its harmful effects on health, can be greatly reduced.

Inhibiting Glycation

Preventing damage due to glycation can be accomplished by two general means:

- Preventing the formation of AGEs in the first place, and
- Minimizing the impact of AGEs that are already in the body.

Many of the compounds that can help combat glycation can contribute to both the prevention of AGEs formation and a reduction in the harmful inflammation they trigger.

Benfotiamine

Benfotiamine is a fat-soluble derivative of thiamine that has greater bioavailability that makes it capable of delivering increased clinical benefits.

Benfotiamine blocks several tissue-damaging mechanisms, one of them being the advanced glycation end-products (AGEs) formation pathway.^{16,17} It is also able to limit effects of AGEs by reducing inflammation and harmful AGE-triggered changes.¹⁷

Most human studies have evaluated the ability of benfotiamine to prevent or reverse complications of diabetes caused by glycation. Clinical markers of diabetic nerve disease, kidney failure, blood vessel dysfunction, and oxidative stress have all been improved with benfotiamine.¹⁶⁻¹⁸

In one study, those supplementing with benfotiamine saw improvements in diabetic nerve disease symptoms, including pain and loss of sensation.¹⁹

Carnosine

Carnosine is a naturally occurring amino acid derivative that is found in high levels in muscle tissues and the nervous system.

It has been shown to deliver potent anti-glycation activity by preventing the cross-linking of proteins, which is associated with tissue stiffening in the skin, blood vessels, and heart.^{20,21}

In animal models, carnosine supplementation provided a stabilizing effect on atherosclerotic plaques in blood vessels, reducing the risk of stroke or heart attack.^{22,23}

Cross-linking of proteins might also contribute to the structural changes in the brain that leads to Alzheimer's. Studies show that carnosine can prevent these cross-links as well, potentially preventing cognitive decline in the elderly.^{24,25}

Carnosine Improves Skin Appearance

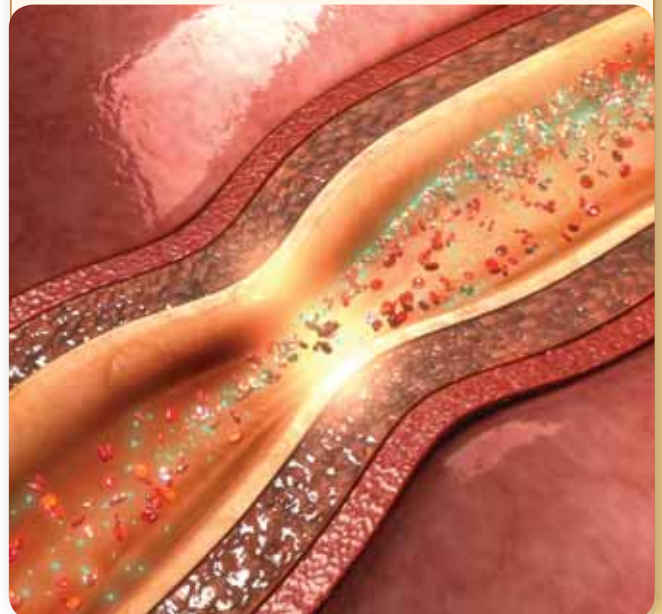
Carnosine is notable in that it is able to stop and remove damaged proteins.²⁰

Glycation of the skin tissues is unique in that its effects can be seen externally in the form of fine lines and wrinkles.

Scientists designed a randomized, double-blind, placebo-controlled study that evaluated a carnosine-based supplement for its ability to improve age-related skin changes, many of which are caused by **cross-linking** of skin **collagen** by glycation. The test formula contained **210 mg** of carnosine and was taken every other day.²⁶

Carnosine and Benfotiamine Fight Glycation

- **Glucose (blood sugar) can form toxic compounds that damage cells and tissues through a process called glycation.**
- **Advanced glycation end-products or AGEs are implicated in accelerated aging, as well as age-related loss of function and chronic diseases of aging.**
- **Several compounds have the ability to prevent, and potentially reverse, glycation and its deleterious effects.**
- **Benfotiamine and carnosine have demonstrated anti-glycation activity that may help slow the aging process.**
- **Glycation damage is not limited to diabetics. Scientists have found it in healthy individuals whose blood levels of fasting glucose are over 85 mg/dL. Most aging people have glucose levels above 85 mg/dL, even though they are not clinically recognized as being diabetic.³²**
- **Eating foods cooked at high temperatures also causes and accelerates glycation damage.³¹**



Healthy adult females were divided into two groups, one taking carnosine and one serving as the control group. Their skin was assessed by a dermatologist using both objective and subjective parameters.

In the carnosine group, there were significant improvements in all parameters, including the skin firmness, smoothness, and reductions of fine lines

Using objective measures, there was as much as a **23%** improvement in skin appearance in the carnosine group.²⁶

What's interesting about this study showing improved outward appearance of aged skin is the modest dose of carnosine used.

A dose **210 mg** of carnosine only lasts about 5 hours in the blood before begin degraded by carnosinase enzymes. That's why many readers of this magazine take **500 mg** of carnosine twice a day, to ensure continuous protection against glycation.

Yet in this study revealing overall improvements in skin appearance, just **210 mg** of carnosine taken every other days resulted in these outward reversals of skin aging.

This indicates lower dose carnosine may provide greater benefits than originally postulated back in 2001.

The Benefits of Higher Doses

A study of 18 people sought to determine carnosine concentrations in blood plasma after eating beef.²⁷ Each 7.1-ounce serving of ground beef used in this study naturally 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, there was again no carnosine in the blood.

This study showed that **248 mg** of carnosine does not provide the body with all-day protection against glycation reactions.

The reason carnosine disappears so quickly from the blood is the presence of an enzyme (carnosinase) that naturally degrades carnosine in the body. This study helps confirm what Life Extension published 18 years ago about the virtues of taking higher-dose carnosine *every day*.^{28,29}

Avoid Foods Cooked at High Temperature

Small changes in cooking methods and diet can dramatically slow glycation damage.

Researchers have determined that **advanced glycation end products** (AGEs) are found in **foods** that are overheated or cooked at very high temperatures.³⁰ This includes foods that have been fried, barbecued, grilled, or broiled.

The worst culprits are overcooked animal products that speed up glycation, but any food that is exposed to extreme high heat can scorch the sugars/fats in food and accelerate formation of advanced glycation end products in the body.

Foods That Accelerate Glycation in the Body

Although glycation forms AGEs inside the body, the diet has also been found to be a significant source of AGEs.^{33,34} Certain methods of **food preparation** increase the AGEs content in foods.

Highly processed foods contain high levels of AGEs, as do protein- and fat-rich foods cooked by dry heat methods such as frying, grilling, and roasting. The browning of food, in addition to adding flavor, produces glycated compounds in the food.

Although only about **10%** of these AGEs consumed in the diet make it into the bloodstream, they are believed to contribute to the overall burden of AGEs and may significantly contribute to aging and chronic disease.³³





AGEs can also be found in many pre-packed foods that have been preserved, pasteurized, homogenized or refined, such as white flour, cake mixes, dried milk, dried eggs, dairy products including pasteurized milk, and canned or frozen pre-cooked meals.

Consider steaming, boiling, poaching, stewing, stir-frying or using a slow cooker. These methods not only cook foods with a lower amount of heat, they create more moisture during the cooking process.

According to a study **Life Extension**® reported on in **2003**, water or moisture can help delay the reactions that lead to toxic glycation byproducts.

Marinating foods in olive oil, cider vinegar, garlic, mustard, lemon juice and dry wines can also help.

In addition, avoiding foods cooked at high temperatures can assist in weight loss.³¹

Summary

Glucose produces glycation compounds that cause significant damage to fats and proteins.

Glycation occurs in diabetics and non-diabetics and has been implicated as a major mechanism of accelerated aging, development of chronic disease and loss of function.

Benfotiamine and **carnosine** help prevent glycation and even reverse some of this damaging process, as observed in the **skin** of females supplementing with a modest dose carnosine. ●

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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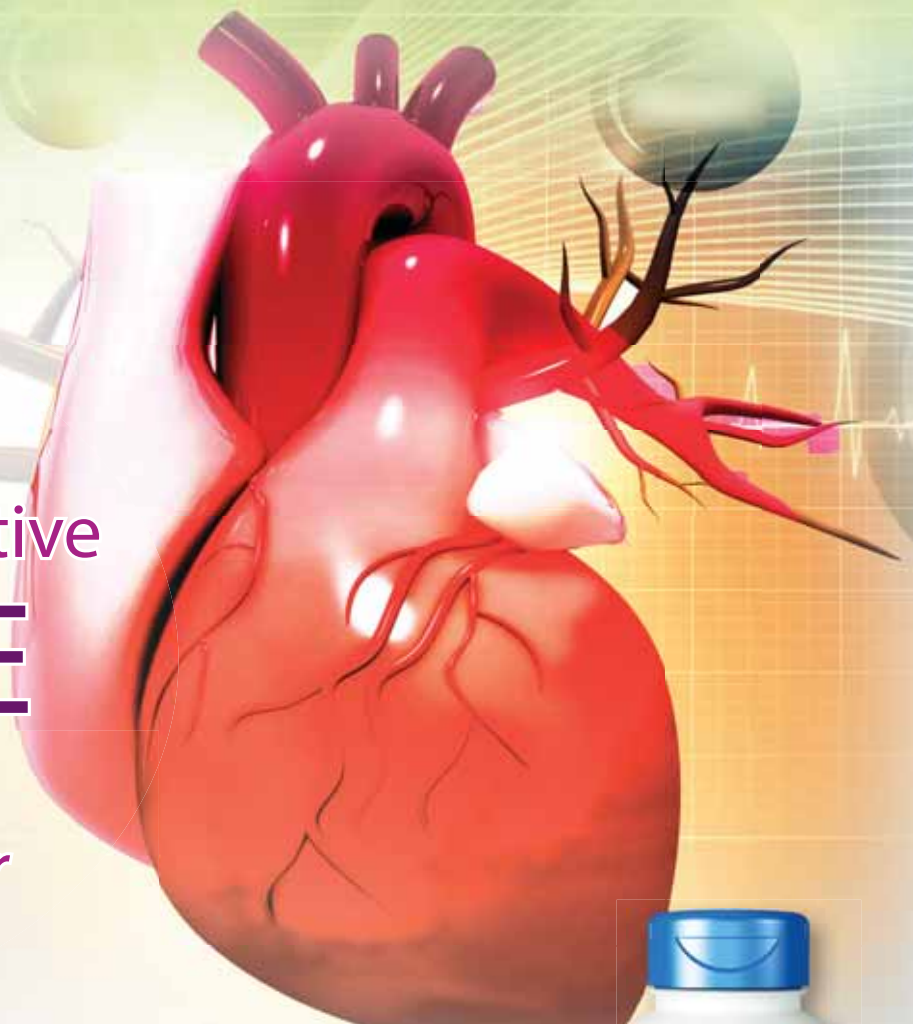
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Beyond Heart Health

The Systemic
Benefits of CoQ10





BY JAKE THACKER

In **1990**, pharmaceutical giant **Merck** was granted a patent on combinations of **statin drugs** and **coenzyme Q10**.

The patent reveals that **statin** drugs deplete **CoQ10** in the body and how taking the combination could yield considerable benefits.

Here is a quote from a Merck patent written in **1989**:

“Since CoQ10 is of benefit in congestive heart failure patients, the combination with HMG-CoA reductase inhibitors [statins] should be of value in such patients who also have the added risk of high cholesterol levels.”

Merck never made a combination statin and CoQ10 drug. It was up to patients or their physician to figure out they could benefit with CoQ10 when taking a drug like Zocor® (simvastatin) that was made by Merck.

Physicians are finally catching on. A reported **71%** of cardiologists prescribe CoQ10 to certain heart disease patients.² But the importance of CoQ10 doesn't stop there.

CoQ10 is a component of the energy supply system of *all* cells in the body, critical for many aspects of our health.

Aging itself is associated with low levels of CoQ10 in the body.^{3,4} The typical modern diet only supplies about **3–6 milligrams** of CoQ10 per day, mostly from meat and fish.⁵

While CoQ10 is best known for heart health, researchers are finding benefits for brain, bone, and metabolic health including reduced mortality.

Heart Health

The medical literature continues to show a vast range of benefits of CoQ10 for cardiovascular health.⁶⁻⁹

One recent study found that, *even without a statin drug*, CoQ10 alone (**120 mg** daily) decreased blood pressure, triglycerides, and LDL cholesterol.⁹ After 24 weeks, subjects with abnormal lipid profiles benefited from a **20%** reduction of triglycerides, **7%** reduction of LDL, and **6%-8%** reduction in blood pressure.

Although the mechanisms of these changes were not specifically assessed, they may be partially related to improvements in **insulin** metabolism that were also observed in the study.

In experimental animal models, CoQ10 has been found to improve markers of blood vessel health and protect the heart muscle.^{10,11} In a rat model of myocardial infarction (heart attack), control animals that did not receive CoQ10 displayed damage to over **65%** of the heart surface. CoQ10-supplemented animals reduced this damage to only **26%**.¹⁰

Studies show that CoQ10 is protective in patients with a history of heart disease, specifically heart failure. In meta-analyses of available studies, researchers found that, compared to control patients without supplementation, CoQ10 decreased mortality, presumably by reducing the incidence of serious

cardiac events.^{6,12} Furthermore, CoQ10 supplementation was associated with improved heart ejection fraction and improved exercise capacity.¹²

A long-term study evaluated people supplementing with **CoQ10** plus **selenium** compared with **placebo**.

Individuals receiving **200 mg** of CoQ10 and **200 mcg** of selenium daily exhibited a significant **41% reduction** in cardiovascular-related **mortality** 12 years later.⁷

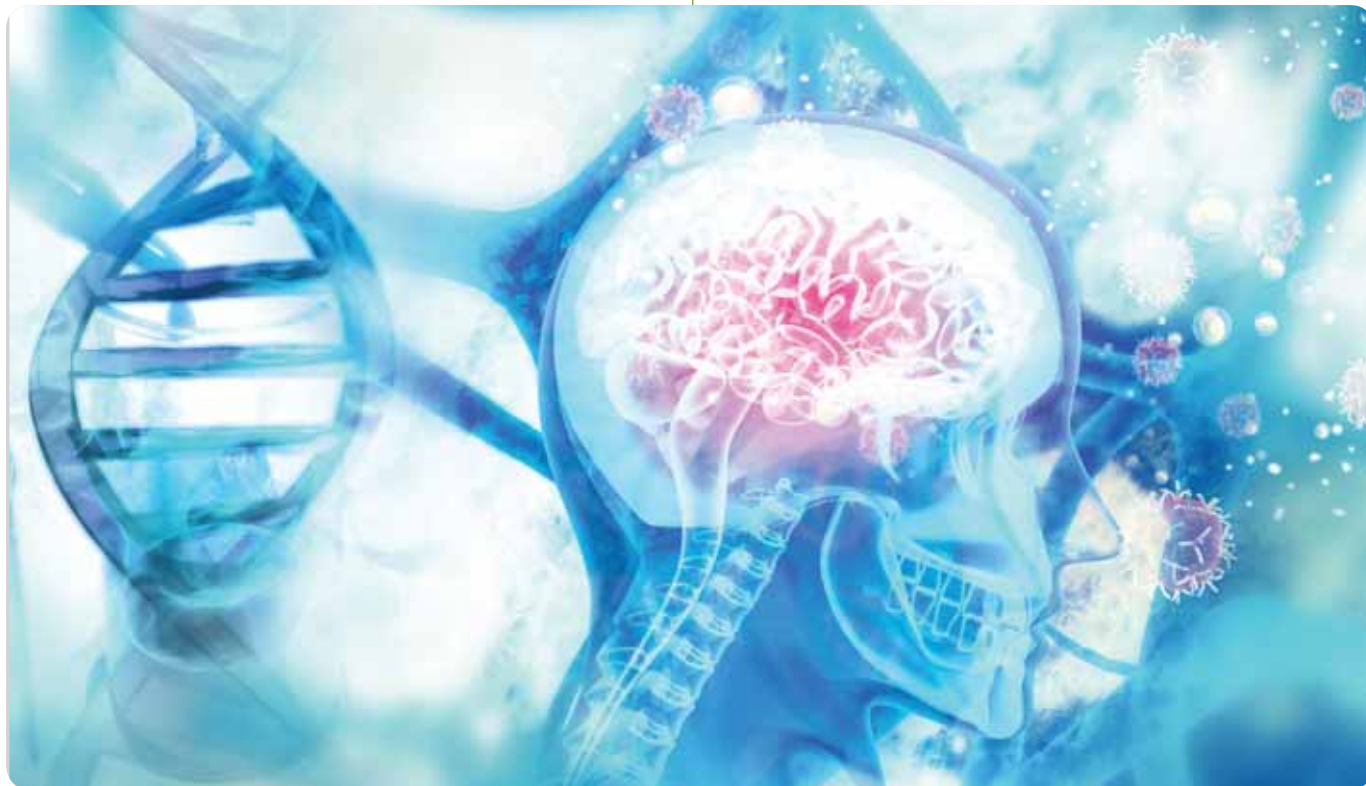
Statin medications are associated with diminished levels of CoQ10 in the body. For this reason, many physicians now recommend that their patients increase their intake of CoQ10 during statin treatment. Also, it is believed that CoQ10 supplementation helps reduce the occurrence and severity of some of the most common side effects of statin drugs, in particular muscle pain.^{3,13,14}

Brain Health

The **brain** is one of the most metabolically active organs in the body.

For this reason, the brain requires an ample supply of energy to function optimally.

So it should come as no surprise that CoQ10 has been found to offer several benefits to the nervous system, including protection from several types of disease.



Several animal studies have found CoQ10 to be **neuroprotective**.¹⁵⁻¹⁷

In traumatic head injuries, the brain suffers from ongoing damage even after the initial trauma. This is due to oxidative stress, inflammation, and impaired mitochondrial function. CoQ10 appears to alleviate these insults.

In a study of rats exposed to a head injury, CoQ10 protected mitochondria from damage and reduced cell death in the brain.¹⁷ These same mechanisms of brain injury occur in human traumatic brain injury as well, making CoQ10 a promising management strategy for head trauma.

Rodent models of stroke also showed benefit from CoQ10, mitigating the damage seen in the brain and reducing markers of oxidative stress, inflammation, and cell death in affected tissues.^{15,16}

Protection Against Brain Damage Caused by Stroke

Promising data from humans link *higher* CoQ10 levels with reduced brain damage caused by ischemic **stroke** and perhaps lower risk of stroke.

Blood CoQ10 levels were evaluated in patients recovering from a stroke and compared to healthy controls.¹⁸

The **stroke** patients had significantly lower blood levels of CoQ10. There was also a correlation between low CoQ10 levels and greater severity of brain injury as measured by clinical scales, the **NIH Stroke Scale** and **Modified Rankin Scale**.

Degenerative Brain Diseases

Neurodegenerative disorders, such as Alzheimer's and Parkinson's disease, are common in older age.¹⁹

CoQ10 may be protective against these debilitating disorders.

In models of Alzheimer's dementia, CoQ10 has been found to improve memory and limit the damage caused by **beta-amyloid**, a harmful protein that builds up in the brain and is implicated in the deterioration of brain function. Furthermore, CoQ10 protects mitochondrial function and limits brain inflammation, all of which contribute to declining cognitive function.²⁰⁻²³

In animal models of Parkinson's, affected animals typically suffer from progressive loss of the control of movement. Treatment of these animals with CoQ10 leads to improvements in motor function as seen on tests of muscle coordination and motor tasks such as swimming. It also slows the progression of the disease.^{24,25}



CoQ10 and Heart Health

- In addition to its use to treat and prevent statin-induced CoQ10 deficiency, the widespread benefits of ample CoQ10 are increasingly being documented.
- CoQ10 is an important coenzyme in the processes that supply energy to cells.
- Increasing CoQ10 intake has been linked to protection from cardiovascular disease, neurological conditions, age-related bone loss, metabolic disorders such as obesity and diabetes, and more.
- While the intake of CoQ10 from a typical diet is small, it can easily be augmented by supplementation and is well-tolerated even at high doses.

Metabolic Benefits

Recent statistics from the U.S. Department of Health and Human Services and the Centers for Disease Control and Prevention estimate that almost **40%** of all U.S. adults are obese and close to **10%** have diabetes.^{26,27} More than *twice* that many have elevated blood glucose and are at risk for diabetes in the future.

Supplementation with CoQ10 has been linked to prevention of the development and progression of both obesity and diabetes, along with improvement in markers of sugar and fat metabolism.²⁸⁻³⁰

A study evaluating a mouse model of obesity and diabetes showed several beneficial effects of CoQ10. Supplementation led to activation of an *enzyme* which helps boost the metabolism of fats, which prevented obesity and development of diabetes. Despite a similar overall food intake, those animals receiving CoQ10 had a **12% reduction** in body weight and reduced deposition of fatty tissue.²⁸

What is Coenzyme Q10?

CoQ10 is a crucial component of the electron transport chain within the **mitochondria** inside all our living cells. Mitochondria are essentially our cellular “power generators,” converting the energy stored in nutrients into a form that can be used by the cell to do various forms of work.

Without CoQ10, cellular energy supply fails, and cells cannot function normally.

Additionally, this coenzyme is a potent scavenger of potentially harmful free radicals, protecting cells from the oxidative stress that contributes to dysfunction and many diseases.

In the treatment of diabetes in human trials and animal models, the addition of CoQ10 improves glucose control and decreases resistance to insulin. Cellular resistance to insulin is a causative mechanism of high glucose levels in type II diabetics.^{29,30}

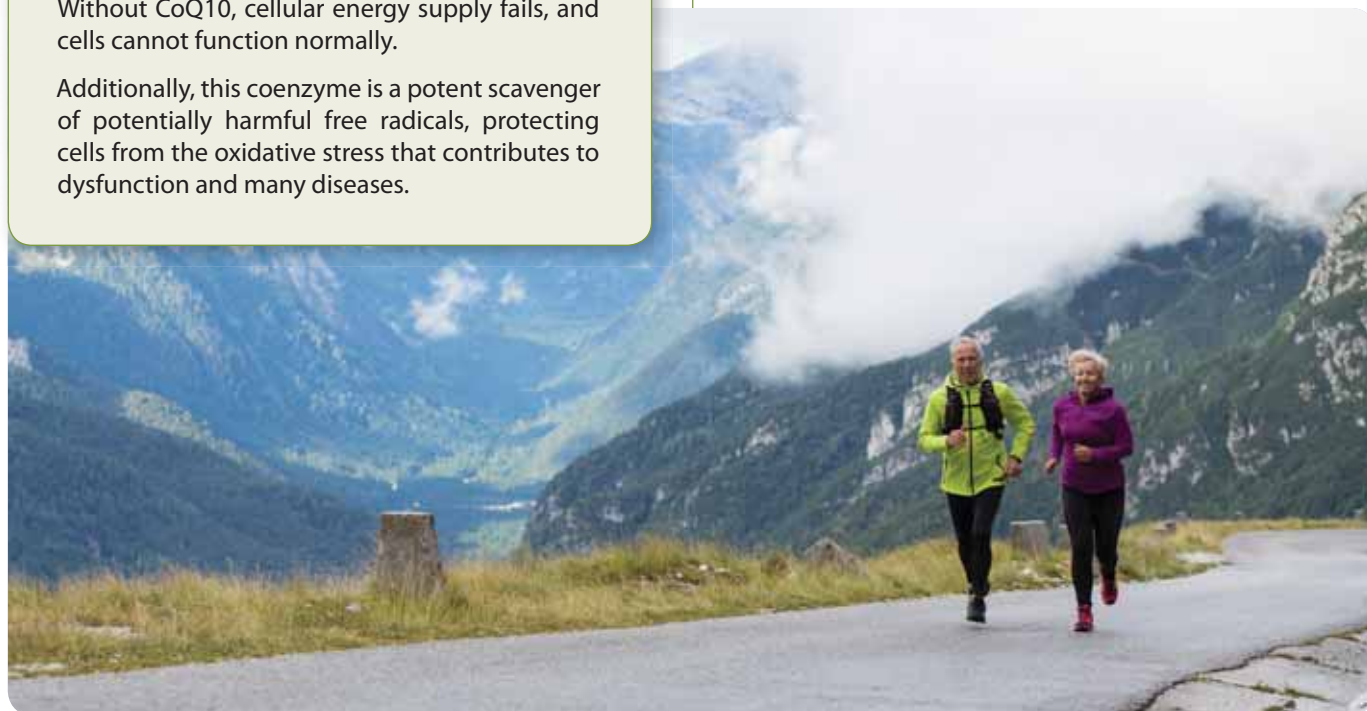
In addition to its direct impact on diabetes, CoQ10 may also help to protect kidney function from various forms of injury.³⁰⁻³² Toxic injury to the kidney was reduced from **21%** to **7%** with a combination treatment containing CoQ10.³¹

Protection of kidney function is particularly important in individuals suffering from type II diabetes, as declining kidney function is a common complication. Studies in humans have seen improvements in systemic markers of inflammation and improved insulin and lipid metabolism in patients with diabetic renal disease.^{30,32}

Better Bones

Aging is associated with a decline in **bone density**, including **osteoporosis**, which increases the risk for fractures. Osteoporosis is a major contributor to disability and mortality in the elderly.³³⁻³⁵

Although bones may appear to be inert structures, they are actually quite dynamic tissues. Throughout life, they require constant remodeling, a balance between bone reabsorption and new bone growth, to maintain peak condition. If the balance leans toward more reabsorption and less new bone formation, bones grow thin and fragile.



CoQ10 has demonstrated, in preclinical models, the ability to improve bone health. It has been observed to prevent age-related decline in bone density, decreasing reabsorption of bone while boosting new bone formation and stimulating the growth of cells that form new bone (*osteoblasts*).^{36,37}

Along with other bone health vitamins and minerals, such as **vitamin K** and **calcium**, CoQ10 can be an important component of a comprehensive bone health strategy.

Other Benefits

Over 100 clinical trials utilizing CoQ10 are currently registered with the *National Institutes of Health* (ClinicalTrials.gov), ranging from treatment of depression to healthy reproductive function.

Some studies have suggested CoQ10 may be a useful adjunct to chemotherapy and/or radiation in the management of cancer.³⁸ It may act as a sensitizer, enhancing these treatments' effect of killing cancer cells in one model. It may even have activity against some cell types associated with *development* of cancer and other pathologies.³⁹

For example, **pancreatic stellate cells** have been implicated in the pathogenesis of pancreatic cancer and other chronic conditions of the pancreas. When these cells are treated with CoQ10, the expression of genes associated with the formation of cancer are significantly reduced, potentially limiting the development and progression of these conditions.³⁹

As part of a wellness strategy, CoQ10 has been found to decrease clinical markers of inflammation and contribute to reversal of age-related physiological changes. It helps reduce levels of compounds associated with systemic inflammation, such as C-reactive protein and tumor necrosis factor.^{4,40}

Summary

Coenzyme Q10 has been used as an adjuvant to cholesterol-lowering statin medications to help limit their side effects, namely muscle soreness.

More widespread roles of CoQ10 are increasingly being recognized.

The typical dietary intake of CoQ10 is small, primarily from meat and fish. CoQ10 supplementation has been associated with various health benefits. ●

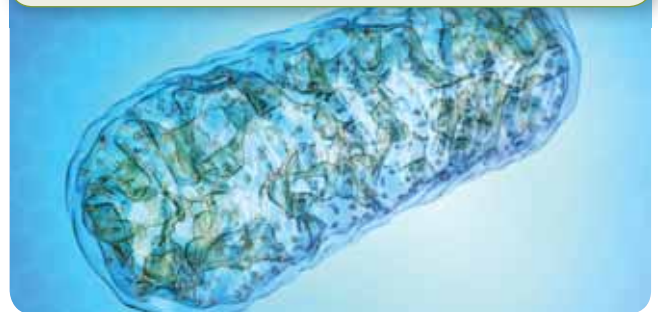
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CoQ10, Mitochondria, and Cellular Energy Supply

All cells require energy to function. While this energy initially comes from nutrients obtained through the diet, such as carbohydrates and fats, it must be converted into a universal form that each cell can utilize, a high-energy molecule called **adenosine triphosphate (ATP)**.

The great majority of ATP is formed in cellular structures called **mitochondria**. In the mitochondria, the energy stored in nutrients is passed through several intermediates in the process that is known as the electron transport chain, ultimately leading to the synthesis of new ATP. CoQ10 is one of these critical intermediates. Without it, this process grinds to a halt and the production of ATP is compromised.

CoQ10 is vital to the metabolism of **all** living cells.



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CoQ10 Improves Response of Brain Cancer Cells to Treatment

Glioblastoma multiforme is the most aggressive and deadly form of primary brain cancer. Despite years of research, treatment for this rapidly growing tumor is rarely capable of containing its spread.

However, a study released in 2018 provides hope that CoQ10 may be a useful tool in the management of glioblastoma.³⁸

Researchers found that human glioblastoma cells treated with CoQ10 were much more sensitive to **radiation**, commonly used as a treatment for this brain cancer. Furthermore, when used along with **temozolomide**, the most common chemotherapy drug used against glioblastoma, the two compounds together showed a strong effect, further amplifying the treatment effect of radiation.

These results suggest that CoQ10 is a promising adjunct to the medical management of glioblastoma, amplifying the effect of current standard treatments.

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Carnosine

Protects Against Formaldehyde Exposure

BY CYNTHIA GROTTON

On a daily basis, we are often surrounded by the toxic chemical **formaldehyde**.

It is used in carpeting, wood products, automobiles, paper products, and even wrinkle-resistant clothing.¹ E-cigarettes deliver a substantial concentration of formaldehyde.²

Scientists are recognizing that long-term, chronic exposure to low levels of formaldehyde poses a serious health threat. This pathology is similar to that posed by another problem: excess **blood sugar**.

High blood **sugar** and **formaldehyde** destroy cell structures by **cross-linking** the body's proteins. When this happens as a result of high **glucose** levels, it is called **glycation**.

Emerging research shows that **formaldehyde** may be as destructive as excess glucose.

Formaldehyde may play a role in dementia, diabetes, and possibly depression.³ All three have been proposed to share a common cause, which is **formaldehyde-induced** crosslinking of the body's proteins.

Crosslinking of the body's proteins occurs in the presence of excess **blood sugar**. This causes formation of **advanced glycation end-products** that render portions of the body's tissues **non-functional**.

Formaldehyde **cross-linking** and **glycation** are similar chemical processes. Exposure to formaldehyde may be implicated in accelerated aging.³

These destructive processes have a potential resolution: the supplement called ***arnosine***.

Three Disorders of Aging: A Connection with Formaldehyde

Most physicians think of diabetes, dementia, and depression as three separate conditions that grow more common with aging. New research has proposed a fascinating possibility: that the ubiquitous environmental toxin formaldehyde interrupts the vital structure and function of proteins and DNA in our cells.

Not only that, but this same destructive formaldehyde-driven cross-linking speeds aging and raises our risk for age-related disorders,³ in a fashion similar to high blood glucose-driven glycation.

Many studies reveal associations between formaldehyde exposure and age-related problems, including glaucoma, stroke, Alzheimer's disease, and cognitive decline.³⁻¹⁰ The fact that all these conditions have known links to **glycation** demonstrates that formaldehyde-caused **cross-linking** may be just as pernicious.¹¹⁻¹⁴

Compounding the problem, formaldehyde has been shown to interfere with basic mitochondrial function.^{3,15,16} In preclinical studies,

formaldehyde has been shown to contribute to memory decline and impair normal **DNA** function.^{3,10,15-17}

Since it is nearly impossible to avoid exposure to this ubiquitous toxin, the question is whether there's a way to reduce its harmful effects.

The answer is yes, and it is found in *arnosine*.

Carnosine Combats Formaldehyde Effects

Carnosine (not to be confused with **carnitine**) has many functions in human biology. The most important function of **arnosine** is in protecting our proteins and DNA against deformation as a result of cross-linking.

Just as *arnosine* can protect against sugar-induced crosslinking (glycation), it also is now of interest for its ability to protect against formaldehyde-caused crosslinking.¹⁸

Further evidence of *arnosine's* anti-crosslinking ability comes from how it neutralizes *methylgly-*

oxal,^{3,19,20} a byproduct of excessive blood sugar that has been associated with many of the complications of type II diabetes, including damage to eyes, brain, kidneys, and other organs.²¹⁻²³

In cell cultures, **arnosine** delayed *senescence*, the cellular manifestation of aging that leads to tissue and organ failure.^{3,24}

In addition to its ability to fight destructive **cross-linking** caused by **formaldehyde** and glucose, **arnosine** can inhibit the *enzymes* that break down neurotransmitters.²⁵

Carnosine has been shown to react directly with formaldehyde, suppressing its ability to entangle DNA strands,¹⁸ while also stimulating mitochondrial activity.²⁶⁻²⁸

One recent animal study found that *arnosine* protected rats from the ill effects of acute formaldehyde inhalation.²⁹ Elevated formaldehyde levels were found in the brains of age-accelerated lab animals,^{30,31} while *arnosine* supplementation **delayed** the onset of accelerated aging.³¹



These findings suggest that **carnosine** can react with and help neutralize **formaldehyde** while also suppressing the age-related generation of formaldehyde in the brain. Our bodies produce small amounts of toxic aldehydes as part of so-called normal metabolic process.^{3,17}

Taken together these findings suggest that:

- Dementia, depression, and diabetes (type II) share potential relationships to formaldehyde exposure and toxicity.
- Carnosine directly prevents the formaldehyde- and glycation-induced cross-linking that makes our proteins and DNA dysfunctional.

These combined actions make carnosine an appealing defense against the ubiquitous presence of formaldehyde in our environments.³

Summary

Carnosine has long been regarded as a useful dietary supplement for its anti-aging benefits. This includes fighting oxidative stress and glycation.

Evidence now indicates that carnosine can defend our tissues from formaldehyde poisoning and the age-acceleration it brings.

New research suggests that chronic, low-level formaldehyde exposure may be linked to dementia, diabetes, and possibly depression. Specifically, formaldehyde can disturb neurotransmitter and mitochondrial function, and by cross-linking with our proteins and DNA, it can alter myriad critical cell functions.

Sources of Formaldehyde in Daily Living

Formaldehyde is found everywhere in our environments because it has many natural sources, such as forest fires, decomposition, and even volcanoes.¹ These are sources we cannot avoid, and generally they pose little threat.

But **human sources** of formaldehyde far outweigh the natural ones and can produce levels in the air that rise far above the levels considered safe (less than **10 parts per billion**, or PPB).¹

Humans burn fuel and produce millions of tons of emissions annually, which inevitably includes large amounts of formaldehyde. In addition, many synthetic products that we use in everyday life can give off formaldehyde into our indoor air.¹

Sources of combustion known to raise indoor formaldehyde levels include cooking, heating, smoking, and even burning candles and incense. But as shown by the debacle with FEMA trailers in the aftermath of hurricane Katrina, dangerously high formaldehyde levels can come directly out of many products used in the building trade: particleboard, plywood, some fiberboards, and insulating materials.¹

Other indoor sources include many textiles, paints, wallpapers, glues, adhesives, varnishes, and lacquers, as well as household cleaning products (detergents, disinfectants, softeners, carpet cleaners, and shoe products), cosmetics (liquid soaps, shampoos, nail varnishes, and nail hardeners), electronic equipment (computers and photocopiers), and other items like insecticides and paper products.¹

We can avoid some sources of formaldehyde—for example, sitting near a smoker exposes one to formaldehyde levels as high as 160 PPB.¹ But even simply showing up for work in an office building may expose one to levels greater than 25 PPB, according to a U.S. building assessment.¹

In other words, it's practically impossible to avoid exposure to this dangerous chemical. That means our best option is to take nutritional steps to protect ourselves from the age-accelerating effects of this environmental toxin.

Carnosine fights destructive cross-linking caused by the toxin **formaldehyde** as well as from glucose-induced **glycation**.

It's practically impossible to avoid formaldehyde, but supplementing with carnosine offers a way to help protect against its toxic, age-accelerating effects. ●

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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Life Extension® was the **first** to introduce high-dose (**500 mg**) carnosine back in **1999**.

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Promote
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BY SHIRLEY DANNON

The **liver** is a primary defense against daily toxins.

People used to think that the main threat to their liver was **alcohol**.

Today's nemesis is **obesity**. The result is an epidemic crisis of **non-alcoholic fatty liver disease** (NAFLD).¹

Liver-related **deaths** jumped **65%** between **1999** and **2016**.^{2,3}

Milk thistle extract has demonstrated benefits for non-alcoholic fatty liver disease, alcoholic liver disease, and cirrhosis.⁴⁻⁷

When standardized extracts of **milk thistle** are combined with a **phospholipid** delivery system, **absorption** is significantly enhanced.



The public tends to assume that liver disease affects only those who have abused alcohol.

What few people know is that as many as **30%** of all adults suffer from *non-alcoholic* fatty liver disease, mostly caused by **obesity**.

There has been an almost **two-fold** increase in *non-alcoholic* fatty liver disease since **1991**.¹

Those whose diets consist of junk food and drinking sodas are falling victim to non-alcoholic fatty liver disease at alarming rates.⁸

The liver is one of the largest and most important organs in the body. It is susceptible to many sources of damage. These can include fatty liver disease infections, metabolic insults, and toxic poisonings including alcohol abuse.

Milk thistle extract has been shown to guard the liver from damage and reduce liver-related mortality.^{4,9-11}

Factors behind Liver Disease

Poor diets, obesity, and other factors can lead to permanent liver damage. Chronic liver injury increases the risk for **liver cancer**, **cirrhosis**, and **liver failure**.

Here are some underlying correctable risk factors of the surging liver disease epidemic:

- Excess alcohol ingestion (especially without accompanying it with antioxidants like n-acetyl-cysteine).¹²⁻¹⁴
- Excess use of acetaminophen pain-relieving drugs (sometimes sold as Tylenol®).¹⁵⁻¹⁷
- Abdominal obesity and excess body weight that contributes to **nonalcoholic fatty liver disease**.¹⁸ Almost **40%** of adults are clinically obese according to the Center for Disease Control and Prevention (CDC).¹

Considering the critical role of the liver in human health, and the growing incidence of liver disease, researchers have focused on the capacity of **milk thistle extract** to inhibit the most common causes and pathologies of liver damage.

The Potent Liver-Protection Effects of Milk Thistle Extract

Extracts of milk thistle contain several natural compounds that demonstrate the ability to defend the liver from injury. These compounds offer multiple mechanisms of liver protection, including strong oxidant protection and anti-inflammatory properties.^{19,20}

Here are some brief descriptions of studies looking at how milk thistle extract defends against some of the main drivers of liver disease.

Non-Alcoholic Fatty Liver Disease

Non-alcoholic fatty liver disease is characterized by the deposition of **fatty compounds** in the liver. As the name implies, it is *not* caused by alcohol abuse and can occur even in individuals with little or no alcohol intake.

The prevalence of this disease is increasing, closely following the increases seen in *related* disorders, such as diabetes, metabolic syndrome, and obesity.¹ In fact, non-alcoholic fatty liver disease can occur in up to **90%** of obese individuals.²¹ Fatty liver disease is on track to soon surpass alcoholism and viral hepatitis as the most common cause of chronic liver disease.

Early in its course, fatty liver disease may go unnoticed. However, it can progress over time to cause significant **fibrosis** of the liver and ultimately result in liver cancer, cirrhosis, and/or liver failure.

Scientists have demonstrated that, in preclinical models, extracts of milk thistle are capable of changing the *abnormal metabolism* associated with non-alcoholic fatty liver disease, reducing the accumulation of fatty substances and protecting cells from oxidative damage and death.²²⁻²⁴

The mechanism of this protection may involve altering **gene expression** related to lipid metabolism, mitochondrial function, and antioxidant mechanisms.

In multiple studies of humans with fatty liver disease, intake of milk thistle extract has been associated with a *reduction* in fat deposition and *improved* enzyme blood markers of liver damage.²⁵⁻²⁷

A meta-analysis of eight trials concluded that milk thistle extract effectively lowered liver enzymes, compared to controls, in non-alcoholic fatty liver disease patients.²⁸

In randomized controlled trials, non-alcoholic fatty liver disease subjects treated with milk thistle extract for 48 weeks had markedly less fibrosis than those who received placebo.^{25,26,29}

Alcohol and Other Liver Toxins

The liver is susceptible to an array of dangerous toxins known as **hepatotoxins**, including *Amanita* mushrooms, acetaminophen, arsenic, alcohol, and others.^{5,30,31}

Research shows that milk thistle extract prevents liver damage when given before or during the exposure to a liver toxin.^{9,10,32,33}

A common toxic cause of liver injury is alcohol abuse, and it appears to be on the rise, particularly in young adults.^{2,3} The best prevention of alcoholic liver disease is cessation of alcohol intake, but clinical trials have shown that milk thistle extract can even benefit people who've already developed the condition.^{6,11}

One of these trials evaluated three different dose levels and found that the highest doses, **360 mg** per day of the milk thistle extract preparation, resulted in the greatest improvement in liver enzyme levels.⁶ Another study showed that a group of patients with alcohol-induced liver disease who were treated with milk thistle extract showed improvements in liver enzymes and liver pathology.⁷

New studies show even what some people consider moderate alcohol ingestion can inflict an injurious impact.³⁴ One might consider supplementing with milk thistle extract, n-acetyl-cysteine, vitamins B1, and C before ingesting ethanol.³⁵

Milk Thistle Extract and Liver Protection

- The liver is one of the largest organs in the body and is critical for numerous functions, including removing environmental and dietary toxins from the body.
- Liver disease is on the rise, affecting a large percentage of the population.
- Extracts of milk thistle contain a powerful blend of liver-protecting compounds that help defend against toxins and oxidative stress.
- Studies have demonstrated the ability of milk thistle extracts to protect the liver from a variety of causes of injury.
- Standardized extracts of milk thistle complexed to phospholipids provide the greatest absorption into body tissues.





Cirrhosis

Cirrhosis is the end-stage of chronic liver injury. It can occur following years of ongoing liver injury from a number of possible causes, including viral and alcoholic hepatitis.

Cirrhosis is generally considered irreversible. But scientists have observed promising improvements with milk thistle extract in clinical trials.

In one such trial of 60 patients with alcoholic liver cirrhosis, those randomized to receive **450 mg** of a milk thistle extract daily benefited from a reduction in a marker of liver fibrosis, along with improvements in oxidant reduction.³⁶

Also, in a study of alcoholic and non-alcoholic patients with cirrhosis, **420 mg** of milk thistle extract per day was associated with a higher overall four-year survival. This study showed that **58%** of subjects supplementing with milk thistle survived compared to only **39%** survival in controls (who did not receive milk thistle extract).⁴ The greatest clinical improvement was observed in alcoholics.

Summary

Among its myriad functions, the liver is crucial for detoxification, purifying the body of various toxic substances. As it performs these functions, the liver is itself prone to injury.

Acting through multiple mechanisms, compounds in **milk thistle extract** have the ability to protect the liver against toxins and metabolic disorders.

Health-conscious individuals can boost their body's absorption of these protective compounds by taking standardized extracts of milk thistle that have been made more bioavailable via a phospholipid delivery system. ●

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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Phospholipids: Improving the Bioavailability of Milk Thistle Extract

Novel formulations of milk thistle extract have been developed that greatly improve the ability of the digestive system to absorb its beneficial compounds.

By joining these compounds with natural **phospholipids**, such as **phosphatidylcholine**, the bioavailability of standardized extracts of milk thistle is greatly increased.³⁷

This new delivery system has been shown both to increase entry of milk thistle's essential liver-protective compounds into the body and to maximize its beneficial effects.³⁷

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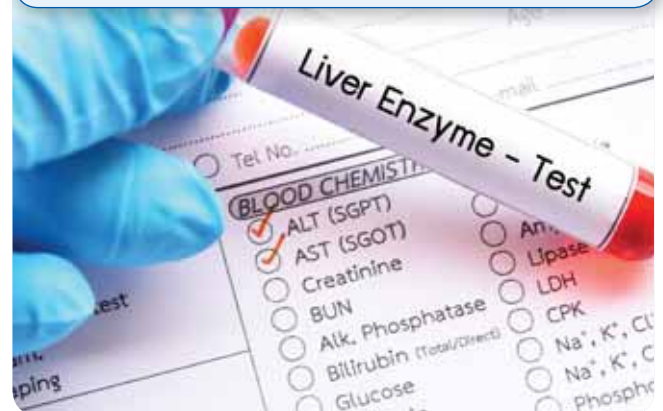
Liver Enzymes as Markers of Liver Injury

Measurement of **liver enzyme** levels is an important tool that clinicians and researchers use to identify ongoing liver injury.

These proteins, including **AST** and **ALT**, are normally present inside liver cells. However, when any pathology causes damage to liver cells, the levels of these enzymes rises in the blood, detectable on a simple blood test.

Elevated liver enzyme levels are therefore a useful marker of liver disease and can help to track response to treatment.

Milk thistle extracts have been found to decrease liver enzyme levels in many clinical studies, indicating protection from various types of liver injury.^{6,28,38-41}



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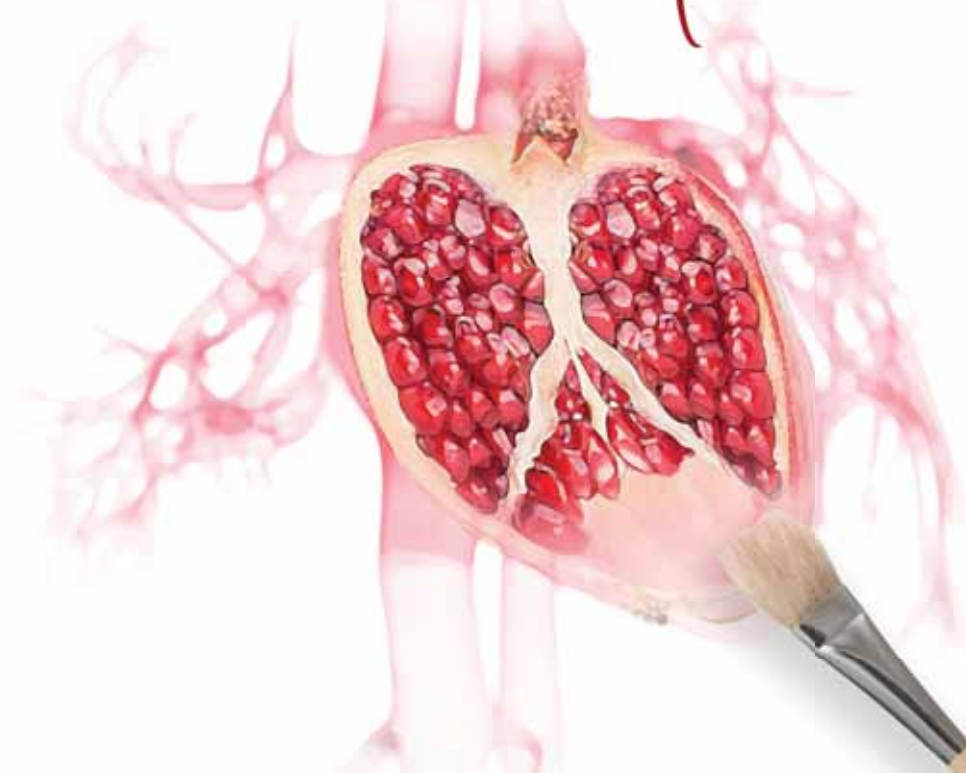
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“Smart” Vacation Offers Water Fast

BY GARY GREENBERG

For many people, going on a vacation is a time for overindulgence. But a health-promoting businessman and a noted holistic healer have combined forces to develop a “smart vacation,” where people treat their bodies to a respite from the typically toxic nature of day-to-day life.

Real estate investor Harold Lebovic and chiropractor Dr. Frank Sabatino operate the all-inclusive Balance for Life Health Retreat in Deerfield Beach, Florida. Participants stay in a posh hotel by a scenic and lively stretch of beach. But instead of gorging on decadent dishes and downing frozen cocktails in local hotspots like other tourists, they subsist on either a plant-based diet or water alone.

“There’s nothing wrong with taking a party vacation in Las Vegas, New York, or Hawaii, but you’re likely to come home exhausted,” says Lebovic, the founding owner of Balance for Life. “With so much obesity, diabetes, high blood pressure, stress, and depression out there, a lot of people want to take a smart vacation where they can do things to improve their health.”



FRANK SABATINO, DC, PhD



The Chicago-based real estate mogul first discovered the benefits of destination spas 30 years ago, when he visited the Shangri-La Natural Hygiene Institute in southwest Florida.

“I was your typical overstressed, overweight, drinking, smoking real estate investor,” admits Lebovic, 67. “I quit smoking, lost weight, and came home feeling revitalized.”

Through the years, he participated in similar programs at the Regency Health Resort & Spa in Hallandale Beach, Florida, and in 1994 founded the Fit for Life program at an oceanfront hotel he owned in nearby Pompano Beach. He’s since sold that hotel but opened the Heartland Spa in Wisconsin, and in January 2018 he started Balance for Life.

Lebovic brought in Sabatino—who previously ran programs at Shangri-La and the Regency—as a managing partner and medical health director for Balance for Life. Sabatino is a staunch proponent of eating a plant-based diet and a

leading practitioner of medically supervised water-only fasts.

In his youth, Sabatino says he suffered from colitis and cured himself by eating a plant-based diet.

“I’ve been a vegan for 40 years and raised my five children that way,” he boasts. “The last time I saw a doctor was when I was 15, and I haven’t had a day of major sickness in over 30 years.”

Sabatino, 68, has a PhD in cell biology and neuroendocrinology, and while an assistant professor at the University of Texas School of Medicine, he performed landmark research on how calorie restriction affects stress and aging. Animal research consistently shows that reducing caloric intake increases lifespan,¹ and clinical observations suggest the same holds true for humans.² Of course, a water-only fast is the ultimate calorie restriction.

Like other animals, Sabatino explains, humans evolved to survive extended periods without food. Our bodies became very efficient at stor-

ing excess intake during bountiful times, primarily as fat, to use as fuel for lean times. But in these days of abundance, there are no lean times for a majority of Americans. The stored fat doesn’t get burned off and instead accumulates, causing obesity and raising the risk of a host of health problems, including diabetes, heart disease, cancer, and all-cause mortality.³

A water-only fast can help to reverse that trend because it forces the body to switch from glucose to fat as the primary source of energy.

“When you stop the intake of food, you have nothing to replenish your blood sugar,” says Sabatino. “You use up your glucose reserves after about 24 hours, and the body starts creating glucose from fat and protein in a process called gluconeogenesis.”

While some experts have raised concerns that water-fasting can lead to lean muscle loss due to its usage of protein for energy, Sabatino contends that the impact is minimal.

“Initially, there’s about two to three ounces of protein loss per day during a fast,” he notes. “By the third day, protein loss slows down to less than an ounce a day, and it gets progressively less as the body primarily burns fat. So over the course of a 30-day fast, you’d lose about a pound or two of protein.”

The tradeoff seems like a no-brainer. Studies on both animals and humans over the past several decades indicate that fasting promotes healthy physiologic responses, including hormone modulation, reduced oxidative stress and inflammation, and increased stress resistance. Clinical research in humans also suggests that fasting improves osteoarthritis, rheumatoid arthritis, metabolic syndrome, cardiovascular disease, hypertension, fibromyalgia, chronic pain, and overall quality of life.⁴

“Your body goes from a growth mode into a repair and maintenance mode,” says Sabatino. “It takes energy from whatever it needs least to provide support for whatever it needs most. It most needs vital organs such as the heart, liver, and lungs, and least needs tumors, cysts, stones, and growths. It literally starts breaking down the least-needed things through autophagy.

“A lot of the chemical toxicity in the environment is fat-soluble, so when you break down fat tissue, you dump the toxins into the bloodstream and out through the organs of elimination,” says Sabatino.

The detoxification process can cause some annoying, painful, and even debilitating symptoms, such as nausea, headaches, discharges from mucous membranes, and skin rashes. But they are temporary and just part of the natural healing process.⁵

“We live in a culture where we’ve been educated to fear our own vitality, and we try to medicate any acute symptom out of existence,” Sabatino tells *Life Extension Magazine*[®]. “But detoxification symptoms are a dynamic expression of your own system and the innate wisdom of the body.”

Water fasts can last anywhere from a few days to weeks. While hunger pangs may strike early on, Sabatino says participants quickly lose their appetite when the body shifts to a fat-burning metabolism. And you can go quite a while before actually needing to eat. In fact, some experts estimate that people weighing 150 to 160 pounds may get adequate caloric requirements from their fat reserves for as much as two to three months of fasting.⁶

“There’s a big difference between fasting and starvation,” explains Sabatino. “While fasting, you are living on reserves that you have accrued over a long period of time. When those reserves are surpassed, you go into a state of starvation. I have yet to see anybody close to that, even in a 40-day fast. We have a lot of reserves in this culture of gluttony.”

Water fasts at Balance for Life are medically supervised by Sabatino, who checks the participants’ vital signs a couple of times a day. And he lives within a mile of the resort so he can get there quickly in case of emergency. However, medically supervised fasts are very safe. A recent review of medical records from more than 2,500 water-fasters found that adverse reactions were primarily mild, with only a .002% incidence of “serious adverse events.”⁴

Meanwhile, participants don’t have to do much other than drink about half a gallon to a gallon of purified water a day. And they don’t have to feel guilty about laz-

ing around. Jogging, swimming, biking, and other physical activities are not on the agenda.

One recent Balance for Life participant named Jasmine did a week-long, water-only fast to help knock out the last remnants of her once-crippling arthritis condition.

“Just by eating a vegan diet for the past two and a half years I reduced my arthritis by about 90%, but my fingers and big toe were still bothering me,” the 61-year-old rancher from the Seattle, Washington-area tells *Life Extension Magazine*. “I hoped the water fast would finish the job, which it has. I have no pain at all. I also feel as though I cleaned up my system and that this program will help me for the rest of my life.”



Like everyone on the water fast, Jasmine had to come off it slowly. During her first day back on food, she had nothing but vegetable juices. The next day she indulged in watermelon chunks for lunch and was looking forward to some beans and steamed vegetables for dinner.

“I felt tired but didn’t have any other symptoms,” she says of subsisting on water for a week. “It was a great experience. Every day I could see changes in myself.”

Sabatino adds that water fasting can also spark changes that you can’t see.

“The mindfulness of fasting is very profound,” he explains. “You become more aware of what’s going on inside of yourself. It gives you a better perspective of what your body is capable of doing and what the dynamic process of healing is all about.”

Of course, water fasting isn’t for everyone. Sabatino says people with certain medical conditions such as anemia, eating disorders, or advanced cancer are not good candidates. Others may be eligible but prefer to actually eat food while on vacation. They can opt for Balance of Life’s plant-based program.

The cuisine includes fresh, organic whole foods that are locally sourced whenever possible. Nothing contains gluten, salt, sugar, oils, or animal products. Sabatino considers plants to be the perfect food.

“The sun is the only source of energy for the planet, and plants are the only things on the planet that convert the sun’s energy into food through photosynthesis,” he explains. “So you either eat the plants directly, or you eat the body of an animal that ate plants, either directly or indirectly. The more

you shorten the food chain and get closer to the primary source of energy, the better. Every step down the food chain is a loss of energy and magnification of toxicity.”

While Sabatino believes people can get everything they need from plants, for various reasons some folks may have nutritional deficiencies and can benefit from supplements. To help determine each client’s needs, he worked with experts at **Life Extension**® to devise unique blood panels.

“I support supplementation in the context of whole food nutrition,” he says. “I take it very scientifically, based on blood tests. **Life Extension** presents a synergistic model in its mentality, which I think is great. They look at the way things work in concert with each other, and that offers a bigger picture of the supplement story.”

“I spent years researching all of the supplement companies, including those that are only available to the medical industry, and I felt that **Life Extension** was the best in overall quality and value,” he says. “They are very science-based and do their research.”

Whether you want to go all-out with a water fast or just enjoy a plant-based cuisine, Balance for Life’s “smart” vacation is educational. Daily lectures, classes in yoga, tai chi, and qi gong, and other activities are designed to teach you how to help yourself.

“We focus on helping people be successful after they leave here,” says Sabatino. “We teach them that lifestyle factors really do make a difference.” ●

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

For more information on Harold Lebovic, Dr. Frank Sabatino and the Balance for Life Health Retreat, visit balanceforlifeflorida.com.

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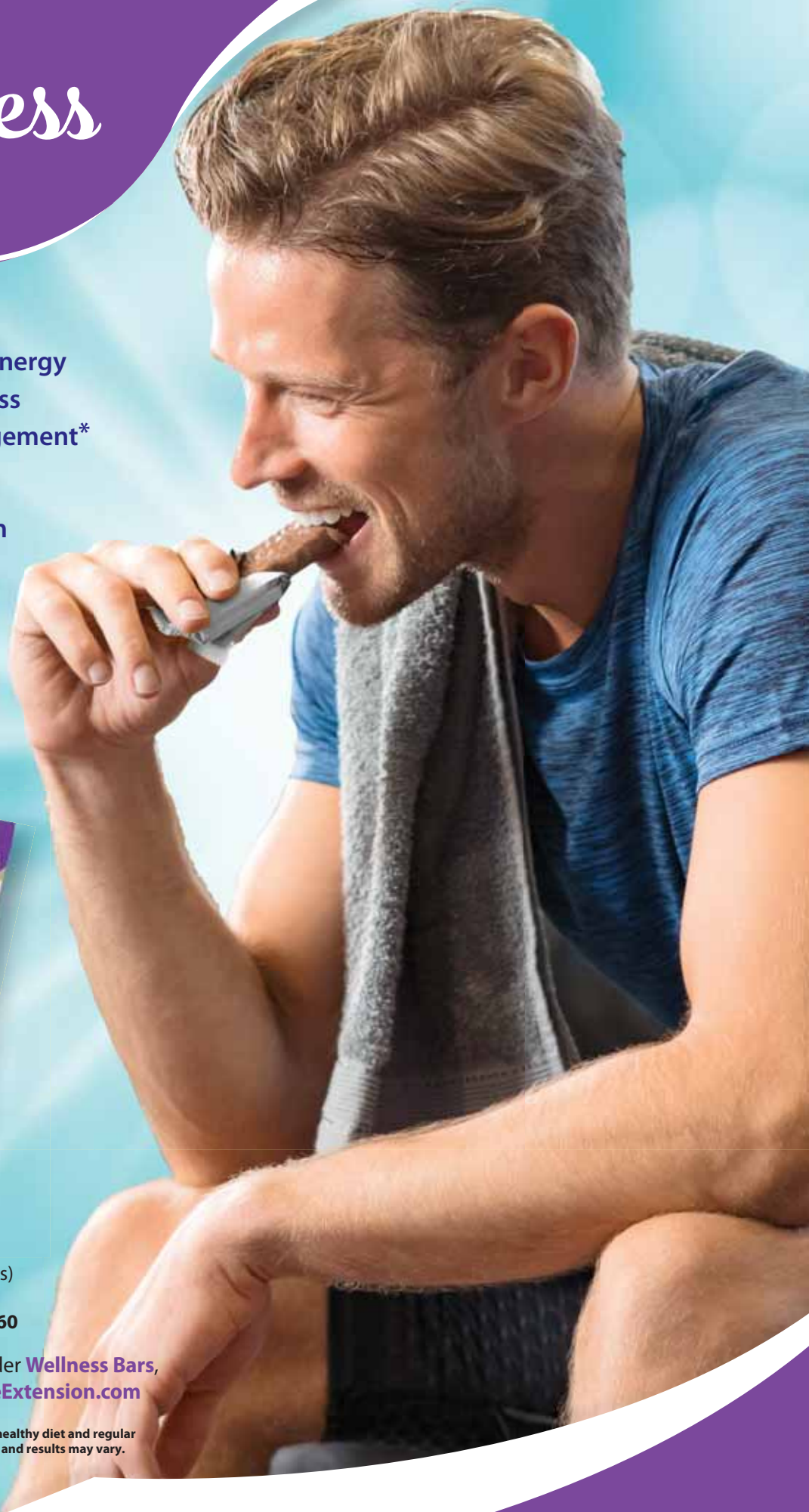
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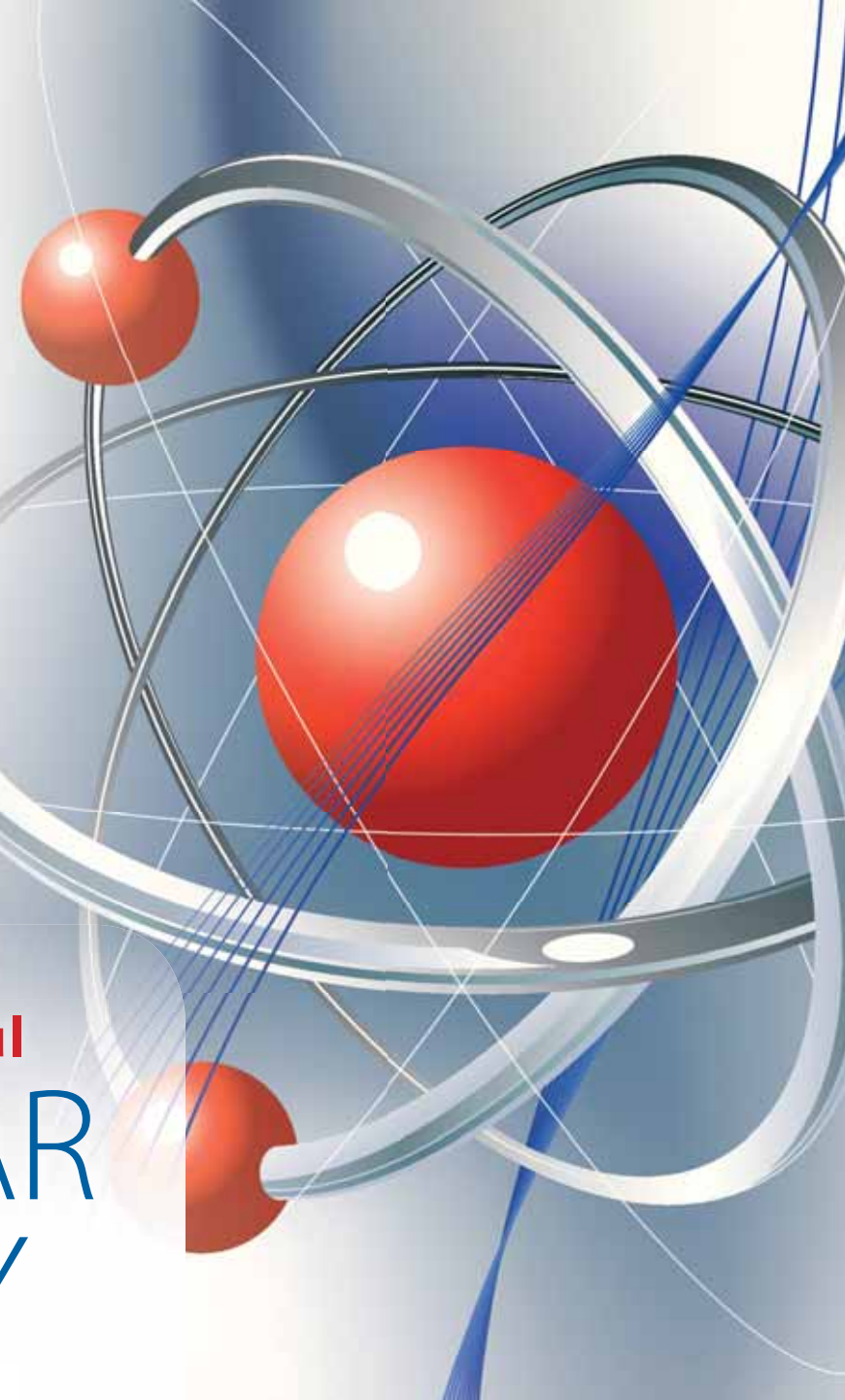
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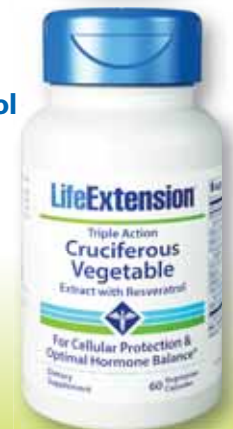
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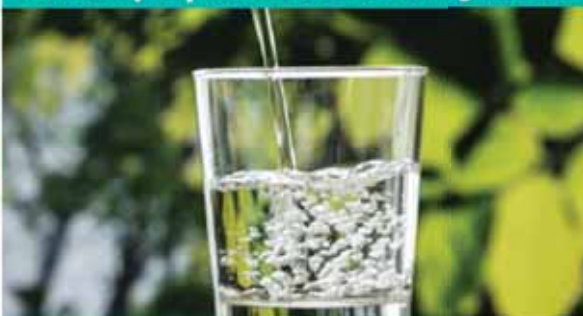
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Gordon Ramsay's Healthy, Lean, & Fit

by Gordon Ramsay

Celebrity chef Gordon Ramsay, star of such popular reality TV shows as *Hell's Kitchen* and *Kitchen Nightmares*, says he began his culinary career in less-than-tip-top physical condition.

Chefs tend to work long hours, Ramsay observes. In addition to lacking time for exercise, they find themselves relying on sugary snacks and junk food in a convenient but unhealthy attempt to keep their energy levels up.

"When I was working in the restaurant at Royal Hospital Road, I never left the kitchen, sending everyone else out on their break rather than getting out myself, and I was snacking on the wrong things throughout the day," says the famously prickly gourmand. "Over time, I let myself get out of shape. My chef's whites got tighter and tighter, and I felt lethargic and sluggish a lot of the time."

Ramsay eventually forced himself to begin an exercise routine, running on a regular basis. He also began sticking with a healthy diet. His excess weight soon melted off, and he was relieved to find himself looking and feeling much better.

Now, Ramsay has written a cookbook, *Gordon Ramsay's Healthy, Lean, & Fit: Mouthwatering Recipes to Fuel You for Life*, which he hopes will inspire more people to follow a healthy lifestyle. Each of the book's recipes has been analyzed by a nutritionist, and they are divided into three sections—Healthy, Lean, and Fit—based on what the reader's specific aims may be. For instance, the "Lean" dishes are focused on weight loss, while the "Fit" dishes are a bit higher in the proteins and carbohydrates you need when on an energy-intensive exercise program. The "Healthy" meals are ideal for simply maintaining an optimum weight, good blood-sugar levels, and proper nutrient intake.

Below, **Life Extension**® has collected a small sampling of the many recipes in Ramsay's book, the first two from the "Healthy" category, the last from the "Lean" category. Enjoy them in good health!

—GARRY MESSICK

ROASTED CAULIFLOWER, QUINOA, AND POMEGRANATE SALAD

SERVES 4

Roasting brassicas like cauliflower, broccoli, kale, and cabbage intensifies the flavor, and they become sweet and almost caramelized around the edges. Cooking cauliflower this way and tossing it in this sharp pomegranate molasses dressing might just convert a few cauliflower haters to the cause. It's a vibrant, satisfying salad that works really well with slow-cooked lamb, grilled chicken, or halloumi.

1 large cauliflower, cut into florets

Olive oil, for drizzling

Sea salt and freshly ground black pepper

1 cup quinoa, rinsed

Small bunch of flat-leaf parsley, leaves picked

Seeds from 1 pomegranate, to serve

FOR THE DRESSING

1 tablespoon pomegranate molasses

1 tablespoon white wine vinegar

1 garlic clove, peeled and crushed

6 tablespoons extra virgin olive oil

Sea salt and freshly ground black pepper

1. Preheat the oven to 375°F.
2. Place the cauliflower florets on a baking sheet and drizzle with a little olive oil. Season with salt and pepper and toss in the oil to coat. Transfer to the oven and roast for about 20 minutes, turning the cauliflower halfway through, until browned in places. Remove from the oven once cooked.
3. Meanwhile, cook the quinoa according to the package instructions.
4. Using a small whisk or a fork, mix the ingredients for the dressing together with a pinch of salt and pepper until completely combined. Taste and adjust the seasoning if necessary.
5. Put the cooked quinoa and the cauliflower into a large bowl. Drizzle with the dressing and fold in the parsley leaves. Scatter over the pomegranate seeds and serve.



ZUCCHINI SPAGHETTI WITH MEATBALLS

SERVES 4

Zucchini noodles, or “zoodles,” have been exploding in popularity. Zoodles with meatballs is filling and comforting, like a normal bowl of spaghetti, but it’s particularly brilliant for all the family as you are upping your veg intake without compromising on flavor or texture. Zoodles are also great with pesto and other classic pasta sauces.

4 large zucchini, trimmed
Olive oil
Grated Parmesan cheese, to serve (optional)

FOR THE MEATBALLS

1 pound lean ground turkey
1 small onion, peeled and very finely chopped
2 garlic cloves, peeled and very finely chopped
2 teaspoons Worcestershire sauce
1 egg, beaten
Sea salt and freshly ground black pepper

FOR THE TOMATO SAUCE

Olive oil
1 onion, peeled and diced
2 garlic cloves, peeled and crushed
1 tablespoon tomato purée
1 (28-ounce) can chopped tomatoes
½ teaspoon dried oregano
½ teaspoon balsamic vinegar
Sea salt and freshly ground black pepper



5. Stir in the tomato purée and continue to cook for 2 minutes, then add the chopped tomatoes, oregano, balsamic vinegar, and a good pinch of salt and pepper. Stir everything together and leave to simmer for 10 minutes, or until slightly thickened.

- Using a spiralizer, julienne peeler, or mandoline, turn the 4 zucchini into spaghetti. Set aside until ready to cook.
- Put the ground turkey into a mixing bowl with the chopped onion, garlic, Worcestershire sauce, beaten egg, and a good pinch of salt and pepper. Mix everything together until thoroughly combined.
- With wet hands, roll the mixture into 20 meatballs and put them onto a plate. Cover with plastic wrap and chill in the fridge for 30 minutes.
- Meanwhile, make the tomato sauce. Place a large skillet over medium heat and add a dash of olive oil. Once hot, add the onion and sauté for 5 to 6 minutes, until softened, then add the garlic and cook for another minute.
- To cook the meatballs, place a skillet over medium heat and add a dash of oil. Once hot, brown the meatballs in batches, turning frequently so they color on all sides. Transfer to the pan with the tomato sauce to cook for an additional 10 minutes, or until cooked through, turning from time to time. (If the sauce becomes too thick, add about 1/4 cup of water.)
- Add an extra teaspoon of oil to the pan the meatballs were browned in and gently sauté the zucchini spaghetti over medium heat, tossing occasionally, for 3 to 5 minutes, until tender but not soft.
- Divide the zucchini spaghetti among serving bowls and top with the meatballs. Sprinkle with Parmesan, if using.

CRISPY SPICED TURKEY WITH EGG AND POTATO SALAD

SERVES 2

Finding ways to load up on carbohydrates without relying on pasta and baked potatoes can be challenging. This crispy turkey is coated with oats and served with an herby new potato salad that will make carb-loading a doddle. When pounding the turkey, keeping its shape isn't as important as getting an even thickness all over, so don't worry if it looks a bit strange.

2 turkey breasts, skin removed
2 cups rolled oats
1 tablespoon sweet smoked paprika
2 eggs
1/3 cup flour
Sea salt and freshly ground black pepper
10 ounces new potatoes
3 tablespoons olive oil
2 tablespoons roughly chopped dill
2 tablespoons roughly chopped parsley
2 tablespoons roughly chopped chives
2 teaspoons capers
Arugula leaves, to serve

1. Lay a piece of plastic wrap over your cutting board and place a turkey breast on top. Lay a second piece of plastic wrap over the top and, using a meat mallet or rolling pin, pound the breast until it is about 1/3 inch thick all over. Repeat this process with the second breast.
2. Mix the oats with the smoked paprika, then scatter them over a large plate.
3. Crack one of the eggs into a shallow bowl and beat with a fork. Pour the flour onto a second plate and season well with salt and pepper.
4. Dip the flattened breasts into the flour one at a time, then dip them into the egg and, finally, coat them in the spiced oats. Keep the breasts in the fridge while you prepare the potatoes.

5. Bring a pan of water to a boil, add the potatoes, and cook for 5 minutes, then add the second egg and continue to cook for 10 minutes, or until the potatoes are cooked through.
6. Drain the egg and potatoes in a colander, then immediately run the egg under cold running water to cool it down.
7. When the potatoes are well drained, tip them into a large bowl. When cool enough to handle, peel and finely chop the egg and add it to the potatoes. Give them a rough stir with a fork to break open some of the potatoes, then, while still warm, pour in 1 tablespoon of the olive oil, the chopped dill, parsley, chives, and capers, along with a good pinch of salt and pepper. Toss everything gently together, then set aside.
8. Place a large, nonstick skillet over medium-high heat and add the remaining olive oil. When it is hot, carefully slide the coated turkey breasts into the pan and cook for 4 minutes on each side, or until you are sure they are cooked through.
9. Serve the turkey with the salad and a handful of arugula leaves.

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

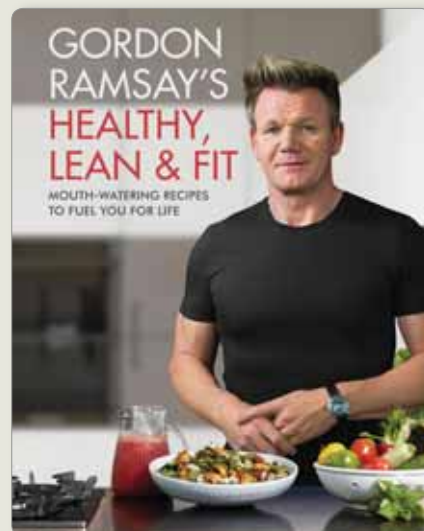
Excerpted from the book *Gordon Ramsay's Healthy, Lean & Fit: Mouthwatering Recipes to Fuel You for Life* by Gordon Ramsay.

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The Circadian Code

By Satchin Panda, PhD

The idea that our waking and sleep cycles operate according to an internal clock called the circadian clock has been around for centuries, but it's only been in the past few decades that we are learning the circadian clock does much more than control sleep.

According to Dr. Satchin Panda, author of *The Circadian Code*, our body plays host to innumerable internal clocks that control everything from our sleep to our mood to our gene expression and disease risk. Unfortunately, our modern world wreaks havoc with these circadian clocks. The combination of poor sleep hygiene, too much exposure to blue light, poor diet, and lack of activity at the right time of day throws our whole circadian system out of balance, resulting in increased vulnerability to a host of maladies from cancer to heart disease to depression. Worse yet, it only takes a few days of living out of balance to throw off our body's well-regulated circadian clocks, says Dr. Panda.

There is good news, however. According to Dr. Panda, it's easy to identify problems with your circadian clock, and with some lifestyle modifications you can restore balance to your circadian rhythm and reap the long-term rewards in the form of better sleep, greater health, and reduced risk of disease. In this exclusive interview with Life Extension®, Dr. Panda talks about his lifetime of work on the circadian rhythm and offers advice on how to restore balance to your life.

—JON VANZILE

LE: What is the circadian rhythm and how does it affect human health?

Dr. Panda: The term “circadian” comes from the Latin *circa*, meaning “around,” and *diem*, meaning “day.” Circadian rhythms are real biological processes that every plant, animal, and human exhibits over the course of a day. These rhythms are governed by internal circadian or biological clocks. Almost each and every one of our cells contains one of these clocks, and each is programmed to turn on or off thousands of genes at different times of the day or night.

These genes influence every aspect of our health. For instance, when we are healthy, we can have a good night’s sleep. In the morning, we wake up feeling fresh and energetic and ready to get to work. Our gut function is perfectly normal. We have a healthy hunger and a clear mind. In the afternoon, we have energy to exercise. At night, we are tired enough to go back to sleep without much effort. Having these rhythms is a sign of being healthy.



Yet when these daily rhythms are disturbed for as little as a day or two, our clocks cannot send the right messages to these genes, and our body and mind will not function as well as we need. If this disruption continues for a few days, weeks, or months, we may succumb to all types of infections and diseases, ranging from insomnia to attention deficit hyperactivity disorder, depression, anxiety, migraine, diabetes, obesity, cardiovascular disease, dementia, and even cancer.

LE: You discuss that there is not a single “circadian clock,” but that each organ system actually operates according to its own clock. Can you explain how that affects organ system health?

Dr. Panda: Circadian rhythms optimize biological functions. Every function in the body has a specific time because the body cannot accomplish all it needs to do at once. The circadian clocks interact with the timing of light, food, and activity to produce our daily rhythms. Our job is to maintain the clock so we can live with optimal health. The best way to do this is to live in accordance with the circadian clock, rather than push against it.

It begins with understanding the role light plays. The light sensors in our eyes are programmed to notice changes in the morning light and adjust our internal clock slightly by a few seconds or minutes every day. This “light entrainment,” or syncing the internal clock to the natural day/night cycle, enabled our ancestors to wake up at dawn, no matter the season.

In order to understand how light affects behavior, we need to focus on evolutionary biology,

which traces our heritage back roughly 200,000 years. Primitive men and women had to wake up before the sun came up if they wanted to be successful hunters. They also had to have enough muscle tone in the late afternoon to run back the few miles they traveled away from the shelter in their search for food.

By the turn of the 20th century, electricity and light spread throughout the Western world, and food production became mechanized. After World War II, with all of these industrial systems in place, almost everyone in the industrialized nations started experiencing circadian disruption. Television, radio, and telephones began entertaining us late into the night. Today, the computer has taken the local evening fireside talk and transformed it into a real, yet virtual, global 24/7 chat session.

Yet while all of these advances are supposed to update the previous technology and make our lives better, they disrupt our body’s clock. Our circadian rhythm continues to be confused by bright light in the evening and limited access to natural light during the day. We simply have not evolved enough to sync our internal clock with the realities of the modern world. Constant exposure to light at night causes circadian disruption that suppresses sleep and leaves us hungry.

Although we have been living with circadian clocks for all of human history, we are just waking up to the key roles of circadian rhythms to stay healthy and prevent diseases. We have created lifestyles, work schedules, and technology without knowing how they affect our circadian rhythms. Now that we have a better understanding of circadian clocks, we can optimize our lifestyle and

living environment to nurture circadian clocks and extend our healthy lifespan.

LE: How does this affect our genes?

Dr. Panda: Every gene in our genome has a circadian cycle. However, they don't cycle at the same times, and some cycle only in one organ. This means that for every tissue there is a hidden time code to our genome. In a recent 2018 study, we found that up to 80% of all genes can be either turned on or off at different times of the day. Having a detailed knowledge of the action of genes and their timing has given us a clear understanding of how circadian rhythm optimizes cell function. For example, cellular repair and cell division is circadian. Our body is being repaired and rejuvenated every day, but this does not happen randomly. Rather, it occurs at a specific time of the day: at night, when we're asleep. This is true for all different types of cellular systems.

LE: So all these systems work together? How can that knowledge help someone get healthier?

Dr. Panda: The clocks in different organs work like an orchestra to create three major rhythms that form the essential foundations of health: sleep, nutrition, and activity. These rhythms are entirely related and are also under our control. When they work perfectly, we have ideal health. When one rhythm is thrown off, the others are upset, creating a downward spiral of poor health.

For example, we are programmed to eat and sleep at certain times, but sometimes our habits and preference can interfere with this program. In fact,



people who are “night owls” likely have bad habits, not any type of genetic issue. They often expose themselves to light, especially blue light from computer screens, late at night. However, when scientists took a group of these “night owls” who couldn't fall sleep early and sent them on a camping trip into the wild, where they were exposed to regular daytime and nighttime light levels, their melatonin levels quickly became completely normal, with melatonin production starting earlier in the evening. Without access to bright light, these people were able to resume a more normal circadian rhythm and they were all able to get to sleep before 10 p.m. This experiment is one of the reasons I'm so convinced we are masters of our health. Correcting habitual behaviors is the key to improving your circadian code.

LE: This same principle works for nutrition and activity?

Dr. Panda: Absolutely. Just like the first light of the morning resets our brain clock, the first bite of the day resets our organ clocks. In fact,

food timing can be a powerful cue to override the master clock. If you typically eat breakfast at 8 a.m., you're setting an appointment with your stomach, liver, muscles, and pancreas, and they will be ready to process breakfast at 8 a.m. Breakfast becomes the cue that syncs the internal clock with your outside time. When you eat at 8 a.m., your system works optimally for about 8 to 10 hours. After a 10-hour window, the gut and metabolic organs will continue to work on food, but their efficiency slows down. So, if you're wondering why diets haven't worked, timing might be the reason. If you eat late at night, or start breakfast at a wildly different time each morning, you are constantly throwing your body out of sync. But don't worry, the fix is equally simple: just set an eating routine and stick to it. The same is true of exercise. As each of us has a unique lifestyle and work schedule, in the book I explain how your current lifestyle may be working for or against your clock, and I guide you in Chapters 4–8 to an optimal timing of food, sleep, light, and exercise to stay healthy.



LE: What kinds of benefits do people see from “fixing” their circadian rhythms?

Dr. Panda: It’s quite possible that some of the daily discomforts, frequent illnesses, or chronic diseases that people may have are linked to circadian disruption. The symptoms of many illnesses include poor or excessive sleep, change in appetite, or reduced physical activity. These are all disruptions to your circadian code. As outlined in Chapters 9–12, by fixing your rhythm, you can potentially correct your disease or lessen its severity, from digestive problems to cancer and dementia. Nurturing your circadian rhythm acts as a grand corrector of all maladies.

LE: What steps can people take to identify and correct their circadian rhythms?

Dr. Panda: If you are living with a medical condition, it is important to know if your condition may be disrupting your daily rhythms. In my book, *The Circadian Code*, I’ve

developed quizzes you can take in the privacy of your own home to help you see if the quality of your circadian code is affecting your health. These quizzes assess how you’re feeling right now, and how far off you are from living within your optimal rhythm. After you take these, you’ll have the information you need to begin making adjustments to optimize your circadian system and benefit your health.

LE: If people do follow your advice, what kind of results can they expect?

Dr. Panda: If you are currently suffering from chronic illness, one of the best things you can do to reverse your course or lessen the severity is to enhance your circadian code. We are beginning to see many examples of people who are finding a whole new healthy lifestyle once they’ve tried this. Enhancing your circadian code isn’t a miracle cure, but by combining your doctor’s recommendations with this information, you

will be doing everything in your power to be master of your own health.

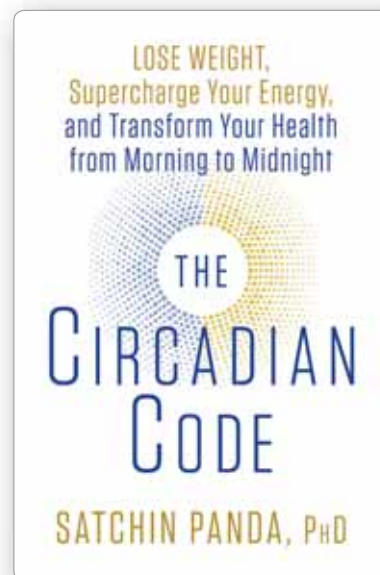
A healthy circadian code prevents or reverses chronic illnesses and at the same time it boosts energy and vitality. As chronic illnesses are the major causes of death and disability, by preventing or reversing these diseases, we can expect to live a long healthy life. ●

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

Adapted from *THE CIRCADIAN CODE: Lose Weight, Supercharge Your Energy, and Transform Your Health from Morning to Midnight* Copyright © 2018 by Satchin Panda, PhD. Published by Rodale Books, an imprint of Penguin Random House LLC.

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<p>MALE BASIC HORMONE PANEL (LC100012) DHEA-S • Estradiol • Total and Free Testosterone • PSA</p>	\$75	<p>ADRENAL STRESS PROFILE – SALIVA (LC100070) ** Check your red flags of adrenal imbalance. This panel contains Cortisol (x4), DHEA, SlgA.</p>	\$159
<p>FEMALE LIFE EXTENSION PANEL (LC322535) CBC/Chemistry Profile • DHEA-S • Estradiol • Homocysteine C-Reactive Protein (high-sensitivity) • Progesterone • Free Testosterone Total Testosterone • TSH for thyroid function • Apolipoprotein B (ApoB) Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c</p>	\$269	<p>SIBO HOME BREATH KIT (LACTULOSE) (LC100063) ** SIBO stands for small intestinal bacterial overgrowth. Research shows that up to 70% or more of those diagnosed with IBS have SIBO.</p>	\$249
<p>FEMALE ELITE PANEL (LC100017)* CBC/Chemistry Profile • Free and total Testosterone • Total Estrogens Estradiol • Estrone • DHEA-S • Progesterone Pregnenolone • Apolipoprotein B (ApoB) DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • HbA1c Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine • Hemoglobin A1c</p>	\$575	<p>COMPREHENSIVE THYROID PANEL (LC100018) TSH, Total T4, Free T4, Free T3, Reverse T3, Thyroglobulin Antibody (ATA), Thyroid Peroxidase Antibody (TPO)</p>	\$199
<p>FEMALE COMPREHENSIVE HORMONE PANEL (LC100011)* CBC/Chemistry Profile • DHEA-S, Estradiol • Total Estrogens Progesterone • Pregnenolone • Total and Free Testosterone • SHBG TSH • Free T3 This panel now includes Free T4 and Cortisol with no increase in price!</p>	\$299	<p>THYROID PANEL WITH REVERSE T3 (LC100044) TSH, Total T4, Free T4, Free T3, Reverse T3</p>	\$120
<p>FEMALE BASIC HORMONE PANEL (LC100013) DHEA-S • Estradiol • Total and Free Testosterone • Progesterone</p>	\$75	<p>OMEGA-3 INDEX COMPLETE ** (LC100066) Beneficial for everyone taking omega-3/fish oil! You want to target a range of 8%-12% for optimal health.</p>	\$99

Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.



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This is NOT a complete listing of LE blood test services.
 Call 1-800-208-3444 for additional information.

* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional \$35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.
 ** This test is packaged as a kit.

Active Lifestyle & Fitness

Creatine Capsules
 Super Carnosine
 Tart Cherry with CherryPURE®
 Wellness Bar—Chocolate Brownie
 Wellness Bar—Cookie Dough
 Wellness Code™ Advanced Whey Protein Isolate Vanilla
 Wellness Code™ Muscle Strength & Restore Formula
 Wellness Code™ Plant Protein Complete & Amino Acid Complex
 Wellness Code™ Whey Protein Concentrate Chocolate
 Wellness Code™ Whey Protein Concentrate Vanilla
 Wellness Code™ Whey Protein Isolate Chocolate
 Wellness Code™ Whey Protein Isolate Vanilla
 Wellness Shake—Chocolate
 Wellness Shake—Vanilla

Amino Acids

Arginine & Ornithine Capsules
 Arginine Ornithine Powder
 Branched Chain Amino Acids
 Carnosine
 D,L-Phenylalanine Capsules
 L-Arginine Caps
 L-Carnitine
 L-Glutamine
 L-Glutamine Powder
 L-Lysine
 L-Taurine Powder
 L-Tyrosine Powder
 Taurine

Blood Pressure & Vascular Support

Advanced Olive Leaf Vascular Support with Celery Seed Extract
 Arterial Protect
 Blood Pressure Monitor Arm Cuff
 Endothelial Defense™ Pomegranate Complete
 Endothelial Defense™ with GliSODin®
 NitroVasc™
 Optimal BP Management
 Pomegranate Complete
 Pomegranate Fruit Extract
 Triple Action Blood Pressure AM/PM
 Venoflow™

Bone Health

Bone Restore
 Bone Restore-Sugar Free
 Bone Restore with Vitamin K2
 Bone Strength Formula with KoAct®
 Bone-Up™
 Calcium Citrate with Vitamin D
 Dr. Strum's Intensive Bone Formula
 Strontium Caps

Brain Health

Acetyl-L-Carnitine
 Acetyl-L-Carnitine Arginate
 Blast™
 Cognitex® Basics
 Cognitex® Elite
 Cognitex® Elite Pregnenolone
 Cognizin® CDP-Choline Caps
 DMAE Bitartrate (dimethylaminoethanol)
 Dopa-Mind™
 Focus Tea™
 Ginkgo Biloba Certified Extract™
 Huperzine A
 Lecithin Granules
 Memory Protect
 Migra-Eeze™
 Neuro-Mag® Magnesium L-Threonate
 Optimized Ashwagandha Extract
 PS (Phosphatidylserine) Caps
 Vinpocetine

Cholesterol Management

Advanced Lipid Control
 Cho-Less™
 CHOL-Support™
 Red Yeast Rice
 Theaflavins Standardized Extract
 Vitamin B3 Niacin Capsules

Digestion Support

Digest RC®
 Effervescent Vitamin C - Magnesium Crystals
 Enhanced Super Digestive Enzymes
 Enhanced Super Digestive Enzymes W/Probiotics
 EsophaCool™
 Esophageal Guardian
 Extraordinary Enzymes
 Gastro-Ease™
 Ginger Force®
 Regimint
 Tranquil Tract™
 TruFiber™

Energy Management

Adrenal Energy Formula
 Asian Energy Boost
 D-Ribose Powder
 D-Ribose Tablets
 Forskolin
 Mitochondrial Basics with PQQ
 Mitochondrial Energy Optimizer with PQQ
 NAD+ Cell Regenerator™
 Optimized NAD+ Cell Regenerator™ with Resveratrol
 PQQ Caps
 Rhodiola Extract
 RiboGen™ French Oak Wood Extract
 Triple Action Thyroid

Eye Health

Astaxanthin with Phospholipids
 Brite Eyes III
 Eye Pressure Support with Mirtogenol®
 MacuGuard® Ocular Support with Saffron
 MacuGuard® Ocular Support with Saffron & Astaxanthin
 Standardized European Bilberry Extract
 Tear Support with MaquiBright®

Fish Oil & Omegas

OMEGA FOUNDATIONS® Clearly EPA/DHA
 OMEGA FOUNDATIONS® Mega EPA/DHA
 OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
 OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract
 OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
 OMEGA FOUNDATIONS® Provinal® Purified Omega-7
 OMEGA FOUNDATIONS® Vegetarian DHA
 Organic Golden Flax Seed

Food

California Estate Extra Virgin Olive Oil
 Kenyan Green Tea Crystals
 Kenyan Purple Tea Crystals
 Rainforest Blend Decaf Ground Coffee
 Rainforest Blend Ground Coffee
 Rainforest Blend Whole Bean Coffee
 Stevia Sweetener

Glucose Management

CinSulin® with InSea^{2c} and Crominex® 3+
 CoffeeGenic® Green Coffee Extract
 Glycemic Guard™
 Mega Benfotiamine
 Tri Sugar Shield®

Heart Health

Aspirin (Enteric Coated)
 BioActive Folate & Vitamin B12 Caps
 Cardio Peak™ with Standardized Hawthorn and Arjuna

Homocysteine Resist
 Optimized Carnitine
 Super Ubiquinol CoQ10
 Super Ubiquinol CoQ10 with PQQ
 Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
 Super-Absorbable CoQ10 Ubiquinone with α -Limonene
 TMG Liquid Capsules
 TMG Powder

Hormone Balance

DHEA (Dehydroepiandrosterone)
 Pregnenolone
 Triple Action Cruciferous Vegetable Extract with Resveratrol
 Triple Action Cruciferous Vegetable Extract

Immune Support

AHCC®
 Bio-Quercetin
 Enhanced Zinc Lozenges
 Immune Modulator with Tinofend®
 Immune Protect with PARACTIN®
 Immune Senescence Protection Formula™
 Kinoko® Gold AHCC
 Kinoko® Platinum AHCC
 Kyolic® Garlic Formula 102
 Kyolic® Reserve
 Lactoferrin (Apolactoferrin) Caps
 NK Cell Activator™
 Optimized Garlic
 Optimized Quercetin
 Peony Immune
 ProBoost Thymic Protein A
 Reishi Extract Mushroom Complex
 Standardized *Cistanche*
 Ten Mushroom Formula®
 Ultra Soy Extract
 Zinc Lozenges

Inflammation Management

5-LOX Inhibitor with AprèsFlex®
 Advanced Bio-Curcumin® with Ginger & Turmerones
 Black Cumin Seed Oil
 Black Cumin Seed Oil with Bio-Curcumin®
 Boswellia
 Cytokine Suppress™ with EGCG
 Serraflazyme
 Specially-Coated Bromelain
 Super Bio-Curcumin®
 Zylamend™ Whole Body

Joint Support

Arthro-Immune Joint Support
 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
 ArthroMax® with Theaflavins & AprèsFlex®
 ArthroMax® Elite
 Fast-Acting Joint Formula
 Glucosamine/Chondroitin Capsules
 Krill Healthy Joint Formula
 MSM (Methylsulfonylethylmethane)
 NT2 Collagen™

Kidney & Bladder Support

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

Liver Health & Detoxification

Anti-Alcohol HepatoProtection Complex
 Calcium D-Glucarate
 Chlorella
 Chlorophyllin
 European Milk Thistle
 Glutathione, Cysteine & C
 HepatoPro
 Liver Efficiency Formula
 N-Acetyl-L-Cysteine
 PectaSol-C®
 Silymarin

Longevity & Wellness

Alpha-Lipoic Acid
AppleWise Polyphenol Extract
Blueberry Extract
Blueberry Extract with Pomegranate
DNA Protection Formula
GEROPROTECT® Ageless Cell™
GEROPROTECT® Longevity A.I.™
Grapeseed Extract
Mediterranean Whole Food Blend
Mega Green Tea Extract (decaffeinated)
Mega Green Tea Extract (lightly caffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Pycnogenol® French Maritime
Pine Bark Extract
Resveratrol
RNA (Ribonucleic Acid)
Senolytic Activator
Super R-Lipoic Acid
X-R Shield

Men's Health

Male Vascular Sexual Support
Mega Lycopene Extract
PalmettoGuard® Saw Palmetto with
Beta-Sitosterol
PalmettoGuard® Saw Palmetto/Nettle Root
Formula with Beta-Sitosterol
Pomi-T®
Prelox® Enhanced Sex for Men
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Prostate Formula

Minerals

Boron
Extend-Release Magnesium
Ionic Selenium
Iron Protein Plus
Magnesium (Citrate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Super Selenium Complex
Vanadyl Sulfate
Zinc Caps

Miscellaneous

Potassium Iodide
Solarshield® Sunglasses

Mood & Stress Management

Advanced Cortisol Balance
Enhanced Stress Relief
5 HTP
L-Theanine
SAME (S-Adenosyl-Methionine)

Multivitamins

Children's Formula Life Extension Mix™
Comprehensive Nutrient Packs ADVANCED
Life Extension Mix™ Capsules without Copper
Life Extension Mix™ Capsules
Life Extension Mix™ Powder without Copper
Life Extension Mix™ Powder
Life Extension Mix™ Tablets with Extra Niacin
Life Extension Mix™ Tablets without Copper
Life Extension Mix™ Tablets
Once-Daily Health Booster
One-Per-Day Tablets
Two-Per-Day Capsules

Nerve & Comfort Support

ComfortMAX™

Personal Care

Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
European Leg Solution Featuring Certified
Diosmin 95

Hair, Skin & Nail Rejuvenation Formula
W/VERISOL®
Life Extension Toothpaste
Venotone
Xylivwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Probiotics

Bifido GI Balance
FLORASSIST® Balance
FLORASSIST® GI with Phage Technology
FLORASSIST® Heart Health
FLORASSIST® Immune Health
FLORASSIST® Mood
FLORASSIST® Nasal
FLORASSIST® Oral Hygiene
FLORASSIST® Prebiotic
FLORASSIST® Throat Health
Jarro-Dophilus® for Women
Theralac® Probiotics
TruFlora® Probiotics

Skin Care

Adult Blemish Lotion
Advanced Peptide Anti-Oxidant Serum
Advanced Growth Factor Serum
Advanced Hyaluronic Acid Serum
Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Triple Peptide Serum
Advanced Under Eye Serum with Stem Cells
All-Purpose Soothing Relief Cream
Amber Self MicroDermAbrasion
Anti-Aging Face Oil
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Aging Rejuvenating Scalp Serum
Anti-Oxidant Serum with
Blueberry & Pomegranate Extracts
Anti-Oxidant Facial Mist Hydrator
Collagen Boosting Peptide Serum
Cucumber Hydra Peptide Eye Cream
DNA Support Cream
Environmental Support Serum
Essential Plant Lipids Serum
Eye Lift Cream
Face Rejuvenating Anti-Oxidant Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydroderm
Lifting & Tightening Complex
Melatonin Advanced Peptide Cream
Melatonin Cream
Mild Facial Cleanser
Multi Stem Cell Skin Tightening Complex
Neck Rejuvenating Anti-Oxidant Cream
Rejuvenex® Body Lotion
Rejuvenex® Factor Firming Serum
Renewing Eye Cream
Resveratrol Anti-Oxidant Serum
Shade Factor™
Shade Factor™ Sunscreen Lotion
Shade Factor™ Sunscreen Spray
Skin Care Collection Anti-Aging Serum
Skin Care Collection Body Lotion
Skin Care Collection Day Cream
Skin Care Collection Night Cream
Skin Firming Complex
Skin Lightening Serum
Skin Restoring Ceramides
Skin Stem Cell Serum
Skin Tone Equalizer
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Triple-Action Vitamin C Cream
Ultimate MicroDermabrasion
Ultra Eyelash Booster
Ultra Lip Plumper
Ultra Rejuvenex®
Ultra RejuveNight®
Ultra Wrinkle Relaxer

Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Lip Rejuvenator
Vitamin C Serum
Vitamin D Lotion
Vitamin K Cream
Youth Serum

Sleep

Bioactive Milk Peptides
Circadian Sleep
Enhanced Sleep with Melatonin
Enhanced Sleep without Melatonin
Fast-Acting Liquid Melatonin
Glycine
L-Tryptophan
Melatonin
Melatonin IR/XR
Optimized Tryptophan Plus
Quiet Sleep
Quiet Sleep Melatonin

Vitamins

Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
BioActive Complete B-Complex
Biotin
Buffered Vitamin C Powder
Fast-C® with Dihydroquercetin
Gamma E Mixed Tocopherol Enhanced
with Sesame Lignans
Gamma E Mixed Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK-7
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5'-Phosphate Caps
Super Absorbable Tocotrienols
Super K with Advanced K2 Complex
Super Vitamin E
Vitamin B6
Vitamin B12
Vitamin C and Bio-Quercetin Phytosome
Vitamin D3
Vitamin D3 with Sea-Iodine™
Vitamins D and K with Sea-Iodine™

Weight Management & Body Composition

2:5 Foundational Support
2:5 LE Plan Chocolate
2:5 LE Plan Combo
2:5 LE Plan Vanilla
7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Appetite Suppress
AMPK Metabolic Activator
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCAActive Garcinia Cambogia Extract
Integra-Lean®
Mediterranean Trim with Sinetrol™ -XPur
Optimized Irvingia with Phase 3™ Calorie
Control Complex
Optimized Saffron with Satiereal®
Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women's Health

Enhanced Sex for Women 50+
Breast Health Formula
Femmenessence MacaPause®
Estrogen for Women
Menopause 731™
Progesta-Care®
Super-Absorbable Soy Isoflavones

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: www.LifeExtension.com

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
25SUPPORT	2:5 FOUNDATIONAL SUPPORT	324.00	195.99				
***25CHOC	2:5 LE PLAN CHOCOLATE	504.00	299.99				
***25COMBO	2:5 LE PLAN COMBO	504.00	299.99				
***25VAN	2:5 LE PLAN VANILLA	504.00	299.99				
A							
01524	ACETYL-L-CARNITINE • 500 mg, 100 veg. caps	32.00	24.00	22.00			
01974	ACETYL-L-CARNITINE ARGINATE • 90 veg. caps	38.00	28.50	26.00			
01628	ADRENAL ENERGY FORMULA • 60 veg. caps	24.00	18.00	16.50			
01630	ADRENAL ENERGY FORMULA • 120 veg. caps	46.00	34.50	31.50			
01807	ADVANCED APPETITE SUPPRESS • 60 veg. caps	38.00	28.50	25.50			
02012	ADVANCED CORTISOL BALANCE • 30 veg. caps	45.00	33.75	30.00			
01828	ADVANCED LIPID CONTROL • 60 veg. caps	30.00	22.50	20.25			
00681	AHCC® • 500 mg, 30 caps	61.98	46.49				
24404	AHCC® (KINOKO® PLATINUM) • 750 mg, 60 veg. caps	84.95	63.71				
29727	AHCC® (KINOKO® GOLD) • 500 mg, 60 veg. caps	74.95	52.47				
00457	ALPHA-LIPOIC ACID W/BIOTIN • 250 mg, 60 caps	37.00	27.75	24.00			
02207	AMPK METABOLIC ACTIVATOR • 30 veg. tabs	38.00	28.50	24.00			
01509	ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN® (Advanced) • 60 veg. caps	39.00	29.25	27.00			
02240	ANTI-ALCOHOL HEPATOPROTECTION COMPLEX • 60 veg. caps	22.00	16.50	15.00			
01625	APPLEWISE • 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	ARGININE & ORNITHINE • 500/250, 100 caps	17.99	13.49				
00038	ARGININE/ORNITHINE POWDER • 150 grams	22.95	17.21	14.25			
01624	(L)-ARGININE CAPS • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	ARTERIAL PROTECT • 30 veg. caps	44.00	33.00	29.00			
01617	ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX® 120 veg. caps	44.00	33.00	30.00			
02238	ARTHROMAX® ADVANCED NT2 COLLAGEN™ & APRÈSFLEX® 60 veg. caps	34.00	25.50	22.00			
02138	ARTHROMAX® ELITE • 30 veg. tablets	30.00	22.50	20.00			
01404	ARTHRO-IMMUNE JOINT SUPPORT • 60 veg. caps	32.00	24.00	21.00			
01533	ASCORBYL PALMITATE • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	ASHWAGANDHA EXTRACT (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	ASIAN ENERGY BOOST • 90 veg. caps	24.00	18.00	16.50			
01066	ASPIRIN • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	ASTAXANTHIN WITH PHOSPHOLIPIDS • 4 mg, 30 softgels	16.00	12.00	10.50			
B							
01945	B-COMPLEX (BioActive Complete) • 60 veg. caps	12.00	9.00	8.00			
00920	BENFOTIAMINE W/ THIAMINE • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	BENFOTIAMINE (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
00664	BETA-CAROTENE • 25,000 IU, 100 softgels	11.75	8.81				
01622	BIFIDO GI BALANCE • 60 veg. caps	20.00	15.00	13.50			
01873	BILBERRY EXTRACT • 100 mg, 90 veg. caps	36.00	27.00	24.00			
01512	BIOACTIVE MILK PEPTIDES • 30 caps	18.00	13.50	12.00			
**01006	BIOSIL™ • 5 mg, 30 veg. caps	19.99	15.99				
**01007	BIOSIL™ • 1 fl oz	31.99	25.59				
SUBTOTAL OF COLUMN 1							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
00102	BIOTIN • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	BLACK CUMIN SEED OIL • 60 softgels	16.00	12.00	10.50			
01710	BLACK CUMIN SEED OIL W/BIO-CURCUMIN® • 60 softgels	32.00	24.00	22.50			
01008	BLAST™ • 600 grams of powder	26.97	20.23				
70000	BLOOD PRESSURE MONITOR (ACCUFIT™) • med/lg cuff	79.99	49.99				
70004	BLOOD PRESSURE MONITOR • Digital wrist cuff	69.95	52.46				
02024	BLOOD PRESSURE (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00			
01214	BLUEBERRY EXTRACT • 60 veg. caps	22.50	16.88	15.00			
01438	BLUEBERRY EXTRACT W/ POMEGRANATE • 60 veg. caps	30.00	22.50	20.25			
01506	BONE FORMULA (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	BONE RESTORE • 120 caps	22.00	16.50	14.25			
02123	BONE RESTORE • Chocolate, Sugar-Free • 60 chewable tabs	22.00	16.50	14.25			
01727	BONE RESTORE W/VITAMIN K2 • 120 caps	24.00	18.00	16.50			
01725	BONE STRENGTH FORMULA W/KOACT® • 120 caps	45.00	33.75	30.00			
00313	BONE-UP® • 240 caps	28.95	21.71	20.41			
01661	BORON • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	BOSWELLA • 100 caps	38.00	28.50	22.50			
00984	BP MANAGEMENT (Optimal) • 60 tablets	44.00	33.00	30.00			
01253	BRANCHED CHAIN AMINO ACIDS • 90 caps	19.50	14.63	12.75			
01942	BREAST HEALTH FORMULA • 60 caps	34.00	25.50	22.50			
00893	BRITE EYES III • 2 vials, 5 ml each	34.00	25.50	24.00			
01203	BROMELAIN (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
C							
01963	CALCIUM CITRATE W/VITAMIN D • 200 veg. caps	18.00	13.50	12.50			
01651	CALCIUM D-GLUCARATE • 200 mg, 60 veg. caps	18.00	13.50	11.25			
01823	CALREDUCE SELECTIVE FAT BINDER 120 mint chewable tablets	45.00	33.75	28.50			
01700	CARDIO PEAK™ W/STANDARDIZED HAWTHORN & ARJUNA 120 veg. caps	36.00	27.00	24.00			
02018	CARNITINE (Optimized) • 60 veg. caps	30.00	22.50	20.00			
01532	L-CARNITINE • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01829	CARNOSINE • 500 mg, 60 veg. caps	36.00	27.00	24.00			
02020	CARNOSINE (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00			
01932	CAT MIX • 100 grams powder	14.00	10.50	8.25			
02199	CHILDREN'S FORMULA LIFE EXTENSION MIX™ 120 chewable tablets	25.00	18.75	17.00			
00550	CHLORELLA • 500 mg, 200 tablets	23.98	17.99				
01571	CHLOROPHYLLIN • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	*CHO-LESS™ • 90 capsules	37.50	37.50				
01910	CHOL-SUPPORT™ • 60 liquid veg. caps	48.00	36.00	32.00			
01504	CHROMIUM W/CROMINEX® 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	CINSULIN® W/INSEA2® AND CROMINEX® 3+ • 90 veg. caps	38.00	28.50	25.50			
02300	CIRCADIAN SLEEP • 30 liquid veg. caps	28.00	21.00	19.00			
01906	CISTANCHE (Standardized) • 30 veg. caps	20.00	15.00	12.00			
00818	CLA BLEND W/SESAME LIGNANS (Super) • 120 softgels	36.00	27.00	24.75	19.75		
SUBTOTAL OF COLUMN 2							

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: www.LifeExtension.com

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
01620	COFFEEGENIC® GREEN COFFEE EXTRACT • 400 mg, 90 veg. caps	32.00	24.00	21.00			
02321	COGNITEX® BASICS • 30 softgels	32.00	24.00	22.00			
02396	COGNITEX® ELITE • 60 tablets	56.00	42.00	38.00			
02397	COGNITEX® ELITE PREGNENOLONE • 60 tablets	58.00	43.50	40.00			
01659	COGNIZIN® CDP-CHOLINE CAPS • 250 mg, 60 veg. caps	36.00	27.00	25.50			
02202	COMFORTMAX™ • 30 day supply	44.00	33.00	29.00			
01945	COMPLETE B-COMPLEX (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02398	COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs	90.00	67.50	61.50			
01949	COQ10 W/d-LIMONENE (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01951	COQ10 W/d-LIMONENE (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	20.00			
01929	COQ10 (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	COQ10 W/PQQ (Super Ubiquinol) • 100 mg, 30 softgels	50.00	37.50	30.00	27.00		
01437	COQ10 W/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 30 softgels	33.00	24.75	22.00			
01426	COQ10 W/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	COQ10 W/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	COQ10 W/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	COQ10 W/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	CRAN-MAX® • 500 mg, 60 veg. caps	17.00	12.75	11.25			
01424	CRAN-MAX® WITH ELLIROSE™ (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	CREATINE CAPSULES • 120 veg. caps	10.95	8.21	6.94			
00467	CURCUMIN® (Super Bio) • 400 mg, 30 veg. caps	20.00	15.00	14.00			
00407	CURCUMIN® (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	CURCUMIN® W/GINGER & TURMERONES (Advanced Bio) 30 softgels	30.00	22.50	20.25			
01804	CYTOKINE SUPPRESS™ W/EGCG • 30 veg. caps	30.00	22.50	20.25			
COSMESIS							
80105	ADULT BLEMISH LOTION • 1 fl. oz	74.50	55.88	49.17			
80157	ADVANCED PEPTIDE ANTI-OXIDANT SERUM • 1 fl. oz	53.00	39.75	34.50			
80165	ADVANCED GROWTH FACTOR SERUM • 1 fl. oz	65.00	48.75	42.75			
80170	ADVANCED HYALURONIC ACID SERUM • 1 fl. oz	45.00	33.75	29.25			
80154	ADVANCED LIGHTENING CREAM • 1 oz	65.00	48.75	42.75			
80155	ADVANCED PEPTIDE HAND THERAPY • 4 oz	46.00	34.50	29.25			
80152	ADVANCED TRIPLE PEPTIDE SERUM • 1 fl. oz	65.00	48.75	42.75			
80140	ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 fl. oz	49.00	36.75	31.50			
80137	ALL-PURPOSE SOOTHING RELIEF • 1 oz	53.00	39.75	34.07			
80139	AMBER SELF MICRODERMABRASION • 2 oz	49.00	36.75	31.50			
80158	ANTI-AGING FACE OIL • 1 fl. oz	59.00	44.25	39.00			
80118	ANTI-AGING MASK • 2 oz	72.00	54.00	47.52			
80151	ANTI-AGING REJUVENATING FACE CREAM • 2 oz	65.00	48.75	42.75			
80153	ANTI-AGING REJUVENATING SCALP SERUM • 2 fl. oz	46.00	34.50	29.25			
80134	ANTI-OXIDANT SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS • 1 fl. oz	33.00	24.75	23.51			
80133	ANTI-OXIDANT FACIAL MIST HYDRATOR • 2 fl. oz	32.00	24.00	22.80			
SUBTOTAL OF COLUMN 3							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
80156	COLLAGEN BOOSTING PEPTIDE SERUM • 1 fl. oz	59.00	44.25	39.00			
80169	CUCUMBER HYDRA PEPTIDE EYE CREAM • .5 oz	38.00	28.50	26.00			
80141	DNA SUPPORT CREAM • 1 oz	49.00	36.75	31.50			
80167	ENVIRONMENTAL SUPPORT SERUM • 1 fl. oz	59.00	44.25	39.00			
80108	ESSENTIAL PLANT LIPIDS SERUM • 1 fl. oz	74.95	56.21	49.46			
80163	EYE LIFT CREAM • 0.5 fl. oz	59.00	44.25	39.00			
80123	FACE REJUVENATING ANTI-OXIDANT CREAM • 2 oz	69.50	52.13	45.87			
80109	HYALURONIC FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28			
80110	HYALURONIC OIL-FREE FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28			
80138	HYDRATING ANTI-OXIDANT FACE MIST • 4 fl. oz	39.95	29.96	28.50			
80103	LIFTING & TIGHTENING COMPLEX • 1 oz	74.50	55.88	49.17			
80168	MELATONIN ADVANCED PEPTIDE CREAM • 1 oz	38.00	28.50	26.00			
80114	MILD FACIAL CLEANSER • 8 fl. oz	59.00	44.25	38.94			
80159	MULTI STEM CELL SKIN TIGHTENING COMPLEX • 1 fl. oz	59.00	44.25	39.00			
80122	NECK REJUVENATING ANTI-OXIDANT CREAM • 2 oz	64.00	48.00	42.24			
80150	RENEWING EYE CREAM • 1/2 oz	65.00	48.75	42.75			
80142	RESVERATROL ANTI-OXIDANT SERUM • 1 fl. oz	46.00	34.50	29.25			
80166	SKIN FIRMING COMPLEX • 1 fl. oz	53.00	39.75	34.50			
80112	SKIN LIGHTENING SERUM • 1/2 fl. oz	85.00	63.75	56.10			
80130	SKIN STEM CELL SERUM • 1 fl. oz	74.00	55.50	51.75			
80164	SKIN TONE EQUALIZER • 0.4 fl oz	59.00	44.25	39.00			
80143	STEM CELL CREAM W/ALPINE ROSE • 1 oz	66.00	49.50	43.50			
80148	TIGHTENING & FIRMING NECK CREAM • 2 oz	39.00	29.25	26.25			
80161	TRIPLE ACTION VITAMIN C CREAM • 1 oz jar	59.00	44.25	39.00			
80162	ULTIMATE MICRODERMABRASION • 8 fl. oz	39.00	29.25	26.25			
80160	ULTRA EYELASH BOOSTER • 0.25 oz	59.00	44.25	39.00			
80116	ULTRA LIP PLUMPER • 1/3 oz	64.00	48.00	42.24			
80101	ULTRA WRINKLE RELAXER • 1 fl. oz	89.95	67.46	59.82			
80113	UNDER EYE REFINING SERUM • 1/2 fl. oz	74.50	55.88	49.17			
80104	UNDER EYE RESCUE CREAM • 1/2 oz	74.50	55.88	49.17			
80171	VITAMIN C LIP REJUVENATOR • 0.5 fl. oz	24.00	18.00	15.60			
80129	VITAMIN C SERUM • 1 fl. oz	85.00	63.75	56.10			
80136	VITAMIN D LOTION • 4 oz	36.00	27.00	25.25			
80102	VITAMIN K CREAM • 1 oz	79.50	59.63	52.47			
80149	YOUTH SERUM • 1 fl. oz	65.00	48.75	42.75			
D							
00658	7-KETO® DHEA METABOLITE • 25 mg, 100 caps	28.00	21.00	18.00			
01479	7-KETO® DHEA METABOLITE • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	DHA (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	DHEA • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
00335	DHEA • 25 mg, 100 caps	16.00	12.00	11.00			
00454	DHEA • 15 mg, 100 caps	14.00	10.50	9.00			
00882	DHEA • 50 mg, 60 caps	19.00	14.25	12.75			
01689	DHEA • 100 mg, 60 veg. caps	24.00	18.00	16.50			
01478	DHEA COMPLETE • 60 veg. caps	48.00	36.00	32.40			
SUBTOTAL OF COLUMN 4							

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

JANUARY 2019

SUPER SALE SAVINGS ON ALL PRODUCTS

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: www.LifeExtension.com

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
30747	DIGEST RC® • 30 caps	19.95	14.96				
02021	DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	DIGESTIVE ENZYMES W/PROBIOTICS (Enhanced Super)•60 veg. caps	28.00	21.00	18.00			
01671	D, L-PHENYLALANINE • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	DMAE BITARTRATE • 150 mg, 200 veg. caps	18.00	13.50	11.25			
02270	DNA PROTECTION FORMULA • 30 veg. caps	20.00	15.00	13.50			
01931	DOG MIX • 100 grams powder	17.00	12.75	11.25			
02006	DOPA-MIND™ • 60 veg. tabs	44.00	33.00	28.00			
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA • 2 oz	39.95	29.96	24.00			
00320	DR. PROCTOR'S HAIR SHAMPOO • 8 oz	24.95	18.71	16.50			
E							
02097	ENDOTHELIAL DEFENSE™ POMEGRANATE COMPLETE • 60 softgels	68.00	51.00	46.50			
00997	ENDOTHELIAL DEFENSE™ W/GLISODIN® • 60 veg. caps	54.00	40.50	36.00			
02200	EPA/DHA (Clearly) • 120 softgels	30.00	22.50	20.00			
01937	EPA/DHA (Mega) • 120 softgels	20.00	15.00	13.50			
02033	ESOPHACOO™ • 60 chewable tablets	12.00	9.00	8.00			
01737	ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01894	ESTROGEN FOR WOMEN • 30 veg. tabs	30.00	22.50	20.00			
01042	EUROPEAN LEG SOLUTION DIOSMIN 95 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	EXTRAORDINARY ENZYMES • 60 caps	26.00	19.50	18.00			
02008	(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	EYE PRESSURE SUPPORT W/MIRTOGENOL® • 30 veg. caps	38.00	28.50	25.50			
F							
00965	FAST-ACTING JOINT FORMULA • 30 caps	39.00	29.25	27.00			
01717	FAST-C® W/DIHYDROQUERCETIN • 120 veg. tabs	26.00	19.50	18.00			
01064	FEMMESENCE MACAPAUSE® • 120 veg. caps	34.99	26.24				
01825	FLORASSIST® BALANCE • 30 liquid veg. caps	32.00	24.00	21.00			
02125	FLORASSIST® GI W/PHASE TECHNOLOGY•30 liquid veg. caps	33.00	24.75	22.50			
01821	FLORASSIST® HEART HEALTH • 60 veg. caps	32.00	24.00	21.00			
02124	FLORASSIST® IMMUNE HEALTH • 30 veg. caps	26.00	19.50	18.00			
02000	FLORASSIST® MOOD • 60 caps	33.00	24.75	22.50			
02208	FLORASSIST® NASAL • 30 veg. caps	36.00	27.00	24.00			
02120	FLORASSIST® ORAL HYGIENE • 30 lozenges	20.00	15.00	13.00			
02203	FLORASSIST® PREBIOTIC • Strawberry flavor, 60 chewable tabs	20.00	15.00	13.00			
01920	FLORASSIST® THROAT HEALTH • 30 lozenges	20.00	15.00	13.50			
02212	FOCUS TEA™ • Spearmint flavor, 14 stick packs	20.00	15.00	13.50			
01913	FOLATE HIGH POTENCY (Optimized) • 5,000 mcg, 30 veg. tablets	18.00	13.50	12.00			
01939	FOLATE (Optimized) • 1,000 mcg, 100 veg. tablets	15.00	11.25	10.00			
01842	FOLATE + VITAMIN B12 (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	FORSKOLIN • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	FUCOIDAN W/MARITECH® 926 (Optimized) • 60 veg. caps	36.00	27.00	24.75			
G							
02070	GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS • 60 softgels	40.00	30.00	27.00			
02075	GAMMA E MIXED TOCOPHEROL W/ENHANCED SESAME LIGNANS • 60 softgels	32.00	24.00	21.75			
01394	GARLIC (Optimized) • 200 veg. caps	24.95	18.71	15.75			
SUBTOTAL OF COLUMN 5							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
02100	GASTRO-EASE™ • 60 veg. caps	44.00	33.00	30.00			
02119	GEROPROTECT® AGELESS CELL™ • 30 softgels	40.00	30.00	27.00			
02133	GEROPROTECT® LONGEVITY A.I.™ • 30 softgels	56.00	42.00	38.00			
01122	GINGER FORCE® • 60 liquid caps	34.95	26.21				
01658	GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps	50.00	37.50	33.00			
02218	GLA WITH SESAME LIGNANS (Mega) • 30 softgels	22.00	16.50	15.00			
00345	(L-) GLUTAMINE CAPSULES • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	(L-) GLUTAMINE POWDER • 100 grams	22.00	16.50	15.00			
00522	GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps	38.00	28.50	24.00			
01541	GLUTATHIONE, CYSTEINE & C • 100 veg. caps	22.00	16.50	15.00			
02122	GLYCEMIC GUARD™ • 30 veg. caps	42.00	31.50	28.00			
01669	GLYCINE • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
02211	GRAPE SEED EXTRACT 100 mg, 60 veg. caps	35.00	26.25	23.00			
00953	GREEN TEA EXTRACT (Mega)•lightly caffeinated,100 veg. caps	30.00	22.50	18.00			
00954	GREEN TEA EXTRACT (Mega)•decaffeinated, 100 veg. caps	30.00	22.50	18.00			
H							
01074	5 HTP • 100 mg, 60 caps	27.95	20.96				
02222	HAIR, SKIN & NAILS REJUVENATION FORM W/VERISOL® 120 tabs	32.00	24.00	22.00			
01738	HCA (Garcinia) • 90 veg. caps	17.00	12.75	11.25			
29754	HCACTIVE™ GARCINIA CAMBOGIA EXTRACT • 90 caps	30.00	22.50				
01393	HEPATOPRO • 900 mg, 60 softgels	50.00	37.50	34.50			
02121	HOMOCYSTEINE RESIST • 60 veg. caps	26.00	19.50	17.50			
01527	HUPERZINE A • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	HYDRODERM® • 1 oz	79.95	59.96	49.00			
I							
01704	IMMUNE MODULATOR W/TINOFEND® • 60 veg. caps	17.00	12.75	11.25			
00955	IMMUNE PROTECT W/PARACTIN® • 30 veg. caps	29.50	22.13	19.91			
02005	IMMUNE SENESENCE PROTECTION FORMULA™•60 veg. tabs	38.00	28.50	26.50			
01674	INOSITOL CAPSULES • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	INTEGRA-LEAN® AFRICAN MANGO IRVINGIA 150 mg, 60 veg. caps	28.00	21.00	18.00			
30731	IONIC SELENIUM • 300 mg, 2 fl. oz	13.69	10.27				
01677	IRON PROTEIN PLUS • 300 mg, 100 caps	28.00	21.00	19.50			
01492	IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00			
J, K, L							
52142	JARRO-DOPHILUS® PROBIOTIC FOR WOMEN 30 enteric-coated veg. caps	27.95	20.96				
00056	JARRO-DOPHILUS EPS® • 60 veg. caps	23.95	17.96				
02034	K W/ADVANCED K2 COMPLEX (Super) • 90 softgels	30.00	22.50	20.25			
01600	KRILL HEALTHY JOINT FORMULA • 30 softgels	32.00	24.00	21.75			
01050	KRILL OIL (Jarrow)• 60 softgels	33.95	25.46				
00316	KYOLIC® GARLIC FORMULA 102 • 200 veg. caps	28.55	21.41				
00789	KYOLIC® RESERVE • 600 mg, 120 caps	30.15	22.61				
01681	LACTOFERRIN • 60 caps	45.00	33.75	30.50			
SUBTOTAL OF COLUMN 6							

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

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ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
00020	LECITHIN • 16 oz granules	19.00	14.25	12.50			
02355	LIFE EXTENSION MIX™ • 240 tablets	74.00	55.50	48.00	42.00		
02357	LIFE EXTENSION MIX™ W/EXTRA NIACIN • 240 tablets	74.00	55.50	48.00	42.00		
02354	LIFE EXTENSION MIX™ • 360 caps	78.00	58.50	50.00	44.00		
02356	LIFE EXTENSION MIX™ POWDER • 12.70 oz	80.00	60.00	54.00	50.00		
02365	LIFE EXTENSION MIX™ W/O COPPER • 240 tablets	74.00	55.50	48.00	42.00		
02364	LIFE EXTENSION MIX™ W/O COPPER • 360 caps	78.00	58.50	50.00	44.00		
01608	LIVER EFFICIENCY FORMULA • 30 veg. caps	18.00	13.50	12.00			
01639	5-LOX INHIBITOR W/APRÈSFLEX® • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	L-LYSINE • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	LYCOPENE (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
M							
01992	MACUGUARD® OCULAR SUPPORT W/SAFFRON • 60 softgels	25.00	18.75	17.50			
01993	MACUGUARD® OCULAR SUPPORT W/SAFFRON & ASTAXANTHIN • 60 softgels	44.00	33.00	30.00			
01459	MAGNESIUM CAPS • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps	13.00	9.75	8.50			
02107	(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps	13.00	9.75	8.75			
02209	MALE VASCULAR SEXUAL SUPPORT • 30 veg. caps	24.00	18.00	16.00			
01908	MEDITERRANEAN TRIM WITH SINETROL™-XPUR 60 veg. caps	18.00	13.50	12.00			
02109	MEDITERRANEAN WHOLE FOOD BLEND • 90 veg. caps	44.00	33.00	30.00			
01668	MELATONIN • 300 mcg, 100 veg. caps	7.00	5.25	4.50			
01083	MELATONIN • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	MELATONIN • 1 mg, 60 caps	5.00	3.75	3.47			
00330	MELATONIN • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	MELATONIN • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	MELATONIN • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
02234	MELATONIN (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
02201	MELATONIN IR/XR • 60 caps	12.00	9.00	7.50			
01787	MELATONIN TIMED RELEASE • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	MELATONIN TIMED RELEASE • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	MELATONIN TIMED RELEASE • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
02101	MEMORY PROTECT • 36 day supply	24.00	18.00	16.00			
02204	MENOPAUSE 731™ • 30 tablets	36.00	27.00	24.00			
01536	METHYLCOBALAMIN • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	METHYLCOBALAMIN • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	MIGRA-EEZE™ (Butterbur) • 60 softgels	33.00	24.75	22.00			
01522	MILK THISTLE (European) • 60 veg. caps	34.00	25.50	22.50			
01922	MILK THISTLE (European) • 60 softgels	28.00	21.00	18.75			
01925	MILK THISTLE (European) • 120 softgels	44.00	33.00	30.00			
01940	MIRAFORTE W/STANDARDIZED LIGNANS (Super) • 120 veg caps	62.00	46.50	42.00			
01869	MITOCHONDRIAL BASICS W/PQQ • 30 caps	40.00	30.00	27.00			
01868	MITOCHONDRIAL ENERGY OPTIMIZER W/PQQ • 120 caps	68.00	51.00	45.00			
00065	MK-7 • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	MSM (Methylsulfonylethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
02221	MUSCLE STRENGTH & RESTORE FORMULA • 94.2 grams powder	36.00	27.00	24.00			
SUBTOTAL OF COLUMN 7							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
N							
01534	N-ACETYL-L-CYSTEINE • 600 mg, 60 veg. caps	14.00	10.50	9.25			
01904	NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE 100 mg, 30 veg. caps	24.00	call for pricing				
02144	NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE 250 mg, 30 veg. caps	48.00	call for pricing				
02148	NAD+ CELL REGENERATOR™ W/RESVERATROL (Optimized) 30 veg. caps	54.00	call for pricing				
01603	NEURO-MAG® MAGNESIUM L-THREONATE • 90 veg. caps	40.00	30.00	27.00			
02032	NEURO-MAG® MAGNESIUM L-THREONATE 93.35 grams • Tropical Punch Flavor	38.00	28.50	26.00			
02090	NITROVASC™ • 30 veg. caps	18.00	13.50	12.00			
01903	NK CELL ACTIVATOR™ • 30 veg. tablets	45.00	33.75	31.50			
00373	NO FLUSH NIACIN • 800 mg, 100 caps	19.00	14.25	12.75			
02231	NT2 COLLAGEN™ • 40 mg, 60 small caps	34.00	25.50	22.00			
O							
01824	OLIVE LEAF VASCULAR SUPPORT W/CELERY SEED EXTRACT (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	OMEGA-3 PLUS EPA/DHA W/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN (Super) • 120 softgels	45.00	33.75	31.50	24.75		
01983	OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
02092	ONCE-DAILY HEALTH BOOSTER • 30 softgels	30.00	22.50	20.00			
02091	ONCE-DAILY HEALTH BOOSTER • 60 softgels	54.00	40.50	38.00			
02313	ONE-PER-DAY • 60 tablets	23.00	17.25	16.00			
01328	ONLY TRACE MINERALS • 90 veg. caps	15.00	11.25	9.38			
P							
01789	PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL 30 softgels	15.00	11.25	10.50	9.00		
01790	PALMETTOGUARD® SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL • 60 softgels	28.00	21.00	19.50	18.00		
*00342	PECTA SOL-C® MODIFIED CITRUS PECTIN • 454 grams powder	113.95	96.86				
*01080	PECTA SOL-C® MODIFIED CITRUS PECTIN • 270 veg. caps	82.95	70.51				
01811	PEONY IMMUNE • 60 veg. caps	36.00	27.00	24.00			
01953	POMEGRANATE COMPLETE • 30 softgels	24.00	18.00	15.75			
00956	POMEGRANATE FRUIT EXTRACT • 30 veg. caps	19.50	14.63	13.16			
*01837	POMI-T® • 60 veg. caps	38.00	28.50	26.00			
00577	POTASSIUM IODIDE • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	PQQ CAPS • 10 mg, 30 veg. caps	18.00	13.50	11.00	10.00		
01647	PQQ CAPS • 20 mg, 30 veg. caps	32.00	24.00	18.00	17.00		
00302	PREGNENOLONE • 50 mg, 100 caps	26.00	19.50	16.50			
00700	PREGNENOLONE • 100 mg, 100 caps	22.00	16.50	15.00			
*01373	PRELOX® ENHANCED SEX FOR MEN • 60 tablets	52.00	39.00	36.00			
00525	PROBOOST™ THYMIC PROTEIN A • 30 packets	66.60	49.95				
SUBTOTAL OF COLUMN 8							

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JANUARY 2019

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ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
01441	PROGESTA-CARE® • 4 oz cream	36.39	27.29	25.72			
02029	PROSTATE FORMULA (Ultra) • 60 softgels	38.00	28.50	26.25	24.00		
01909	PROSTAPOLLEN™ (Triple strength) • 30 softgels	28.00	21.00	18.75			
02261	PROTEIN CONCENTRATE (Whey) Chocolate • 640 gram	30.00	22.50	19.95			
02260	PROTEIN CONCENTRATE (Whey) Vanilla • 500 grams	30.00	22.50	19.95			
02246	PROTEIN ISOLATE (Advanced Whey) Vanilla • 454 grams	30.00	22.50	19.50			
02243	PROTEIN ISOLATE (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
02242	PROTEIN ISOLATE (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
02127	PROTEIN (PLANT) COMPLETE & AMINO ACID COMPLEX 15.87 oz	34.00	25.50	23.00			
01812	PROVINAL® PURIFIED OMEGA-7 • 30 softgels	27.00	20.25	18.00			
01676	PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01209	PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	PYRIDOXAL 5'-PHOSPHATE • 100 mg, 60 veg. caps	22.00	16.50	14.85			
Q, R							
02302	QUERCETIN (Bio) • 30 veg. caps	12.00	9.00	8.00			
01309	QUERCETIN (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
02169	RAINFOREST BLEND GROUND COFFEE • 12 oz. bag	13.00	9.75				
02171	RAINFOREST BLEND WHOLE BEAN COFFEE 12 oz. bag	13.00	9.75				
02170	RAINFOREST BLEND DECAF GROUND COFFEE 12 oz. bag	14.00	10.50				
01030	RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	REGIMINT • 60 enteric-coated caps	19.95	14.96	14.00			
01708	REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps	30.00	22.50	20.25			
01448	REJUVENEX® BODY LOTION • 6 fl. oz	24.00	18.00	14.85	12.75		
01621	REJUVENEX® FACTOR FIRING SERUM • 1.7 oz	65.00	48.75	37.50			
01220	REJUVENEX® (Ultra) • 2 oz	52.00	39.00	33.00	29.25		
00676	REJUVENIGHT® (Ultra) • 2 oz	39.95	29.96	27.00			
02210	RESVERATROL • 100 mg, 60 veg. caps	32.00	24.00	21.00			
02230	RESVERATROL (Optimized) • 60 veg. caps	45.00	33.75	30.00			
00889	RHODIOLA EXTRACT • 250 mg, 60 veg. caps	16.00	12.00	10.50			
01900	RIBOGEN™ FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	(D) RIBOSE POWDER • 150 grams	27.50	20.63	18.56			
01473	(D) RIBOSE TABLETS • 100 veg. tabs	32.00	24.00	21.00			
01208	R-LIPOIC ACID (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	RNA CAPSULES • 500 mg, 100 caps	17.95	13.46	12.12			
S							
01432	SAFFRON W/SATIAREAL® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
02175	SAMe (S-Adenosyl-Methionine) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
02176	SAMe (S-Adenosyl-Methionine) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
02174	SAMe (S-Adenosyl-Methionine) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	SEA-IODINE™ • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
SUBTOTAL OF COLUMN 9							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
01879	SE-METHYL L-SELENOCYSTEINE • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
02301	SENOLYTIC ACTIVATOR • 24 veg. caps	24.00	18.00	16.00			
00318	SERRAFLAZYME • 100 tablets	18.00	13.50	12.00			
01626	SEX FOR WOMEN 50+ (Enhanced) • 90 veg. caps	59.00	44.25	34.00			
01938	SHADE FACTOR™ • 120 veg. caps	44.00	33.00	30.00			
02110	SHADE FACTOR™ SUNSCREEN LOTION • 4 fl. oz	20.00	15.00	13.00			
02118	SHADE FACTOR™ SUNSCREEN SPRAY • 6 fl. oz	22.00	16.50	14.25			
01884	SILYMARIN • 100 mg, 90 veg. caps	14.00	10.50	9.50			
02129	SKIN CARE COLLECTION ANTI-AGING SERUM • 1.75 fl. oz	60.00	45.00	37.50			
02132	SKIN CARE COLLECTION BODY LOTION • 6 oz	28.00	21.00	18.00			
02130	SKIN CARE COLLECTION DAY CREAM • 1.65 oz	50.00	37.50	33.00			
02131	SKIN CARE COLLECTION NIGHT CREAM • 1.65 oz	39.00	29.25	27.00			
02096	SKIN RESTORING CERAMIDES 30 liquid veg. caps	25.00	18.75	17.25			
01444	SLEEP (Quiet) • 60 veg. caps	13.00	9.75	7.50			
01445	SLEEP MELATONIN (Quiet) • 5 mg, 60 veg. caps	18.00	13.50	12.00			
01551	SLEEP W/ MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	SLEEP W/O MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00			
00657	SOLARSHIELD® SUNGLASSES • Smoke color	12.99	9.74	8.63			
01097	SOY EXTRACT (Ultra) • 150 veg. caps	76.00	57.00	50.00			
01649	SOY ISOFLAVONES (Super Absorbable) • 60 veg. caps	28.00	21.00	18.75			
00432	STEVIA™ (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	STEVIA™ ORGANIC LIQUID SWEETENER (Better) • 2 oz	11.00	8.25				
00987	STRESS RELIEF (Enhanced) • 30 veg. caps	28.00	21.00	18.00			
01476	STRONTIUM • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	SUPER SELENIUM COMPLEX • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
T							
02023	TART CHERRY W/CHERRYPURE® 60 veg. caps	20.00	15.00	14.00			
01827	TAURINE • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
02205	TEA CRYSTALS (Kenyan Green) • 14 stick packs	12.00	9.00	8.00			
02206	TEA CRYSTALS (Kenyan Purple) • 14 stick packs	18.00	13.50	12.00			
01918	TEAR SUPPORT W/MAQUIBRIGHT® • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	L-TAURINE POWDER • 300 grams	20.00	15.00	12.66			
*13685	TEN MUSHROOM FORMULA® • 120 veg. caps	41.95	35.66				
01304	THEAFLAVIN STANDARDIZED EXTRACT • 30 veg. caps	18.00	13.50	12.00			
01683	(L) THEANINE • 100 mg, 60 veg. caps	24.00	18.00	15.38			
***01038	THERALAC® PROBIOTICS • 30 caps	47.95	35.96				
00668	THYROID FORMULA (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	TMG POWDER • 50 grams	14.00	10.50	8.25			
01859	TMG • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	TOCOTRIENOLS (Super Absorbable) • 60 softgels	30.00	22.50	21.00			
01278	TOOTHPASTE • 4 oz tube (Mint)	9.50	7.13	6.50			
01917	TRANQUIL TRACT™ • 60 veg. caps	52.00	39.00	34.50			
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT 60 veg. caps	24.00	18.00	16.50			
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL • 60 veg. caps	32.00	24.00	22.20			
SUBTOTAL OF COLUMN 10							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
02003	TRIPLE ACTION THYROID • 60 veg. caps	36.00	27.00	24.00			
01803	TRI SUGAR SHIELD® • 60 veg. caps	36.00	27.00	24.00			
01386	TRUFIBER™ • 180 grams	32.95	24.71				
01389	TRUFLORA® PROBIOTICS • 32 veg. caps	42.95	32.21				
01722	L-TRYPTOPHAN • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	TRYPTOPHAN PLUS (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02317	TWO-PER-DAY CAPSULES • 60 caps	13.00	9.75	8.50			
02314	TWO-PER-DAY CAPSULES • 120 caps	24.00	18.00	16.00			
02316	TWO-PER-DAY TABLETS • 60 tablets	12.00	9.00	7.50			
02315	TWO-PER-DAY TABLETS • 120 tablets	23.00	17.25	15.50			
00326	L-TYROSINE • 500 mg, 100 tablets	13.50	10.13				
U, V							
01921	URIC ACID CONTROL • 60 veg. caps	24.00	18.00	16.50			
00213	VANADYL SULFATE • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
02102	VENOFLOW™ • 30 veg. caps	52.00	39.00	36.00			
00408	VENOTONE • 60 caps	18.95	14.21	12.00			
01327	VINPOCETINE • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	VITAMIN B3 NIACIN • 500 mg, 100 caps	7.65	5.74	4.99			
02028	VITAMIN B5 • 500 mg, 100 veg. caps (Pantothenic Acid)	14.00	10.50	9.50			
01535	VITAMIN B6 • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	VITAMIN B12 • 500 mcg, 100 lozenges	8.75	6.56	5.44			
02228	VITAMIN C and BIO-QUERCETIN PHYTOSOME 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
02227	VITAMIN C and BIO-QUERCETIN PHYTOSOME 1,000 mg, 250 veg. tablets	30.00	22.50	20.00			
00084	VITAMIN C POWDER (Buffered) • 454 grams	28.00	21.00	19.00			
01736	VITAMIN C-MAGNESIUM CRYSTALS (Effervescent) • 180 grams	20.00	15.00	13.50			
01753	VITAMIN D3 • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	VITAMIN D3 • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	VITAMIN D3 • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	VITAMIN D3 • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	VITAMIN D3 W/SEA-IODINE™ • 5,000 IU, 60 caps	14.00	10.50	9.38			
02244	VITAMIN D3 LIQUID • 2,000 IU, 1 fl. oz, unflavored	28.00	21.00	18.75			
02232	VITAMIN D3 LIQUID • 2,000 IU, 1 fl. oz, mint flavor	28.00	21.00	18.75			
02040	VITAMINS D AND K W/SEA-IODINE™ • 60 caps	24.00	18.00	16.50			
01863	VITAMIN E (Super) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	VITAMIN K2 (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
W							
01902	WAIST-LINE CONTROL™ • 120 veg. caps	42.00	31.50	28.50			
02146	WELLNESS BAR • Chocolate Brownie • Box of 12 Bars	32.00	24.00				
02147	WELLNESS BAR • Cookie Dough • Box of 12 Bars	32.00	24.00				
02220	WELLNESS SHAKE • Chocolate • 666 grams	50.00	37.50	34.00			
02219	WELLNESS SHAKE • Vanilla • 648 grams	50.00	37.50	34.00			
X, Y							
01919	X-R SHIELD • 90 veg. caps	15.00	11.25	9.75			
00409	XYLIWHITE™ MOUTHWASH • 16 fl. oz	10.00	7.50				
SUBTOTAL OF COLUMN 11							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
Z							
01813	ZINC HIGH POTENCY • 50 mg, 90 veg. caps	9.00	6.75	6.00			
01561	ZINC LOZENGES • 60 veg. lozenges	9.00	6.75	6.00			
01961	ZINC LOZENGES (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
01254	ZYFLAMEND™ WHOLE BODY • 120 liquid veg. caps	72.95	54.71				
BOOKS							
33842	HEART ATTACK PROOF by Michael Ozner, MD • 2018	19.95	11.99				
33998	THE RIGHT TO TRY by Darcy Olsen • 2016	26.99	20.24				
33875	DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN • by Sandeep Jauhar • 2015	26.00	19.50				
33874	MISSING MICROBES • by Martin J. Blaser, MD • 2014	28.00	21.00				
DPT05	DISEASE PREVENTION AND TREATMENT, FIFTH EDITION (Hardcover) • 2014	69.95	39.95	36.00			
33862	I'M TOO YOUNG FOR THIS • by Suzanne Somers • 2013	26.00	19.50				
33835	PHARMOCRACY • by William Faloon • 2011	24.00	9.60	8.00			
33838	YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	KNOCKOUT • by Suzanne Somers • 2009	25.99	17.00				
34132	TWO'S COMPANY: FIFTY YEAR ROMANCE by Suzanne Somers • 2017	26.00	19.50				
33867	THE COMPLETE MEDITERRANEAN DIET by Michael Ozner, MD • 2014	19.95	9.99				
SUBTOTAL OF COLUMN 12							

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- *** Due to license restrictions, this product is not for sale to Canada.
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- ††† 2:5 LE Plan Kits are not for sale to customers outside the USA and are not included in Super Sale.
- ^ Wellness Bars are not for sale to customers outside the USA.



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SUBTOTAL COLUMN 2

SUBTOTAL COLUMN 3

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SUBTOTAL COLUMN 5

SUBTOTAL COLUMN 6

SUBTOTAL COLUMN 7

SUBTOTAL COLUMN 8

SUBTOTAL COLUMN 9

SUBTOTAL COLUMN 10

SUBTOTAL COLUMN 11

SUBTOTAL COLUMN 12

ORDER TOTALS

SUBTOTAL OF COLUMNS 1 - 12

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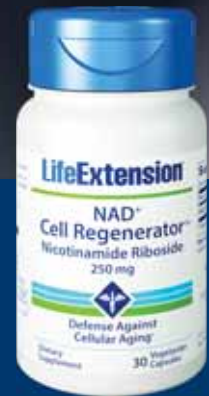
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Item #02148 • 30 vegetarian capsules

	Retail Price	Super Sale Price
1 bottle	\$54	*



NAD⁺ Cell Regenerator™
Item #02144 • 30 vegetarian capsules

	Retail Price	Super Sale Price
1 bottle	\$48	*



* For pricing available to readers of this magazine, call 1-800-544-4440 or visit LifeExtension.com/NAD

For full product description and to order **NAD⁺ Cell Regenerator™** or **Optimized NAD⁺ Cell Regenerator™ with Resveratrol**, call **1-800-544-4440** or visit **www.LifeExtension.com**



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LifeExtension® Magazine



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46 GUARD YOUR BODY'S PROTEINS

When glucose binds to your body's proteins, the result is accelerated aging. Nutrients like **benfotiamine** and **carnosine** provide protection against toxic **glycation** reactions.



69 DEFEND AGAINST FORMALDEHYDE EXPOSURE

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Most Americans are **magnesium** deficient. Increased magnesium intake resulted in a **41% reduction** in **stroke** risk.



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Researchers have discovered new benefits for **CoQ10**, including a reduction of **brain damage** inflicted by **ischemic stroke**.



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