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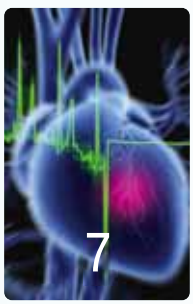

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FISETIN

The Longevity Flavonoid

Fisetin, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a **senolytic** in humans.[1]

In preclinical studies, fisetin:

- Mimics effects of **calorie reduction**[2]
- Targets longevity pathways[2-6]
- Extends lifespan of mice by about **10%**[7]
- Removes **senescent** cells through **senolytic** action[7]
- Suppresses excess **mTOR** activation[8]

Fisetin is poorly *absorbed* due to its breakdown in the small intestines.

Bio-Fisetin solves this problem by enclosing **fisetin** with a compound from the fenugreek herb.

A **human** trial showed **bioavailability** of this new **fisetin** compound increased up to ***25 times*** compared to fisetin by itself.[9]

Just one capsule daily of **Bio-Fisetin** helps manage **senescent cells** and may support overall longevity.

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Heart Attack Makes Deadly Comeback

WILLIAM FALOON

Do you remember how prevalent **heart attacks** and **strokes** used to be in the **1960s**?

Acute **cardiovascular death** was so common that corporations faced management crises as key executives perished from **heart attacks**.

One of medicine's great achievements has been slashing deaths from **heart attack** and **stroke**.

The slides on this page demonstrate remarkable decreases in cardiovascular deaths that have occurred in recent decades.

I use these slides in live presentations to demonstrate how technology is **winning the war** against degenerative aging.

Sadly, a prediction made by many experts has transformed into tragic reality.

Instead of cardiovascular deaths continuing to plummet as they have over the past **60 years**, they are increasing in middle-aged Americans.

In some cases, older parents today are seeing their middle-age children perish from **preventable** vascular disorders.

The reasons are not surprising.

An underlying cause is an **obesity** and **type II diabetes** epidemic that is offsetting robust gains made against **cardiovascular diseases** in past decades.

The encouraging news is that aging individuals can garner significant **protection** by following proven **cardiovascular** risk reduction behaviors.

Those who fail to measure and correct **artery-clogging** factors are at **high** risk of **heart disease** and **stroke**.

Life Extension® readers have **annual blood tests** to take corrective actions before chest pain, paralysis, or death by **arterial blockage** manifests.

This article provides a wealth of published data about how to slash one's risk of suffering a crippling or lethal cardiovascular event.

Enormous Decrease in Cardiovascular Deaths

Between 1980 and 2014

-50%

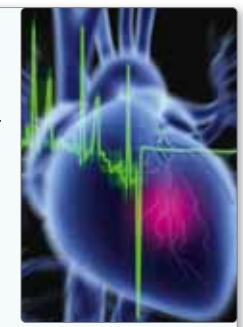
Decrease in Deaths from Cardiovascular Disease

Trends and Patterns of Geographic Variation in Cardiovascular Mortality Among US Counties, 1980-2014. *JAMA*. 2017 May 16;317(19):1976-92.

Sharp Decline in Heart Failure Death Rates

Clinical trials spanning 1995 to 2014 show:

44% decline of sudden death in heart failure patients.



A leading cause of age-related death markedly reduced in just 19 years!

Declining Risk of Sudden Death in Heart Failure. *N Engl J Med*. 2017 Jul 6;377(1):41-51.

America's **heart attack** epidemic peaked in **1968** and steadily declined as more people understood the **artery-clogging** role of poor **dietary** and **lifestyle** behaviors.

Cardiovascular risk plummeted in response to:[1-7]

- Sharp drop in **tobacco** use,
- Improved **emergency** responses,
- Near perfection of **angioplasty** and **stenting**,
- Huge drop in LDL-related **blood lipids** resulting from changes in dietary patterns and advancements in pharmacology,
- Use of **aspirin** for secondary prevention (reduction in heart attack or stroke *after* having had a prior event), and
- Reduced systolic **blood pressure** targets.

There has also been a **20-fold** increased intake of **dietary supplements** (like **vitamin D** and **CoQ10**).

In a remarkable accomplishment, **cardiovascular disease** mortality declined by around **70%** over the past 60 years.[7-10]

This trend of reduced **cardiovascular mortality** has now turned in the wrong direction.

The prime culprit is record numbers of American adults who are **overweight** or **obese**. This has translated into…

A Resurgence of Cardiovascular Disease

Instead of continuing to decline in prevalence, we are seeing progress grind to a virtual halt.

For people aged **45** to **64**, cardiovascular mortality increased during the years **2011** to **2017**.[11] This **death rate** increase represents a reversal of what had been sharp declines in heart attacks and ischemic strokes that occurred in previous decades.

These deadly trends correlate with rising levels of obesity, type II diabetes and blood pressure. Here are current statistics in the United States:[12-14]

- Approximately **40%** of adults are clinically obese.
- Over **30%** are overweight.
- Approximately **10.5%** of adults have diabetes, and
- More than **20%** of those with diabetes don't know they have it.
- Approximately **46%** of American adults have **hypertension** often caused by excess body weight.

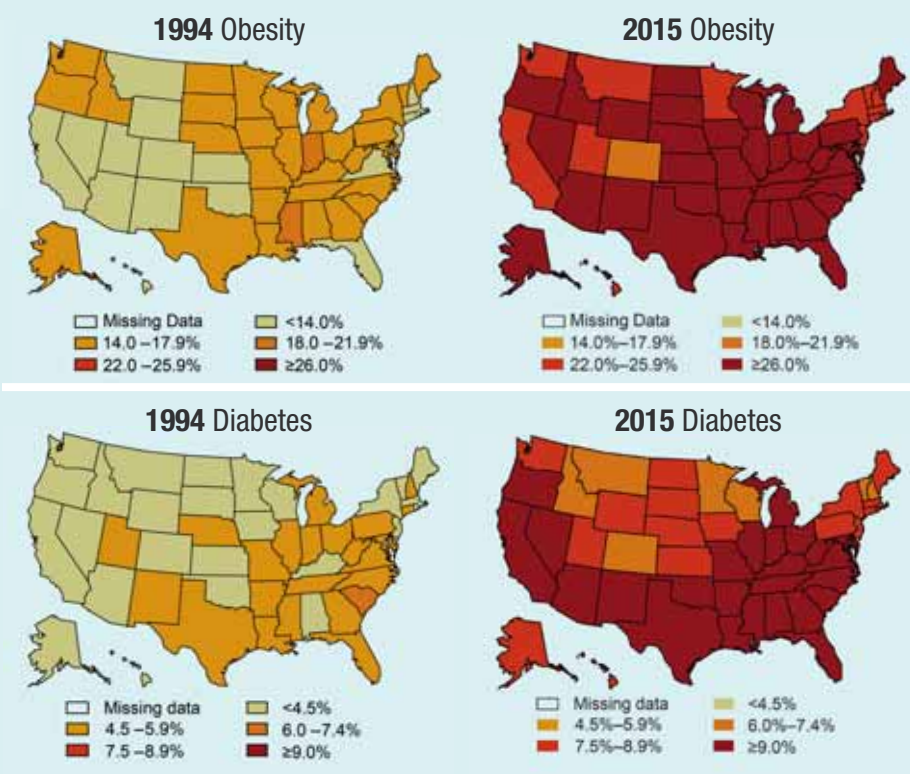
Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among U.S. Adults

These maps reveal striking **increases** in **obesity** (BMI ≥30 kg/m^2) and **diabetes** that occurred between **1994** and **2015**. This is not mere correlation but reflective of the causative impact of excess body weight on one's ability to maintain optimal (lower reference range) fasting insulin and glucose blood levels.

The material is available on the agency website at no charge.

Reference to specific commercial products, manufacturers, companies, or trademarks does not constitute its endorsement or recommendation by the U.S. Government, Department of Health and Human Services, or Centers for Disease Control and Prevention.

Content source:
Centers for Disease Control and Prevention.
https://www.cdc.gov/diabetes/statistics/slides/maps_diabetesobesity_trends.pdf



More Heart Failure Deaths

Deaths from heart failure began a steep decline **25 years ago** but began surging higher nine years ago as the population ages and the health of younger individuals worsens.

Between **2011** and **2017,** the death rate from **heart failure** increased **20.7%** and will likely keep climbing sharply, according to a study published in the *JAMA Cardiology*.[21]

The study attributed the resurgence in **heart failure deaths** to the aging population, along with *higher* rates of **obesity** and **diabetes**, including in people under age 65.

The reprint on the left side page shows maps from the ***Centers for Disease Control and Prevention***.

They depict an outbreak of **obesity** and **type II diabetes** beginning in **1994** whose impact on **cardiovascular disease incidence** is now manifesting into deadly reality.

A Ticking Time Bomb

What the maps on the facing page don't reveal is the number of **undiagnosed** diabetics, which is **astronomical** based on today's surging **obesity** epidemic.

These maps also don't consider a position that **Life Extension**® took in the early **1980s** that the concept of "**prediabetes**" is highly misleading.

That is because damage to eyes (retinopathy), kidneys (nephropathy), and nerves (neuropathy) begins *before* the onset of full-blown **diabetes**.

Our position has been validated in dozens of studies showing that damage to blood vessels, nerves, kidneys, and eyes accumulates with *suboptimal* **glycemic control** before full-blown **type II diabetes** is diagnosed.[15-20]

To put this into numerical perspective, conventional medicine guidelines in the **1980s** diagnosed **type II diabetes** when **fasting glucose** reached **140 mg/dL** (on two occasions).

Life Extension® vehemently argued that any **fasting glucose** reading over **100 mg/dL** increased one's risk of developing diabetes, as well as silent damage to blood vessels, nerves, eyes, and kidneys.

For decades, we urged our readers to keep their fasting glucose between **70-85 mg/dL**.

Obesity Surges

A startling **72%** of Americans are **overweight** or **obese**.[12]

The average person's glycemic **blood markers** (hemoglobin A1c, insulin and glucose) today are at frighteningly high levels.

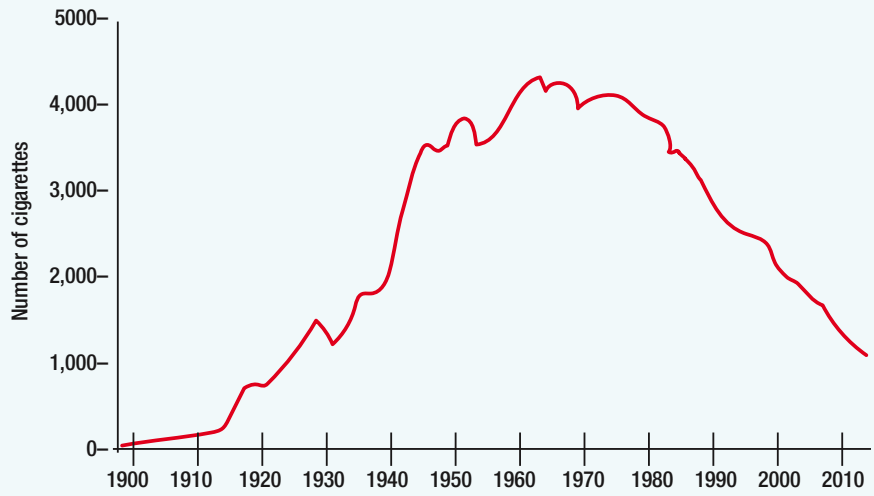
I analogize this ticking **diabetic time bomb** to how **lung cancer deaths** did not sharply increase until **30 years** after **cigarette** smoking became prevalent after year 1900.

We are now about **27 years** into a spiraling rise of **obesity prevalence**. The pathologic impact is being demonstrated by increased **heart disease deaths** in middle-aged Americans.[22]

You don't have to be a victim, even if you are in the diabetic or overweight category.

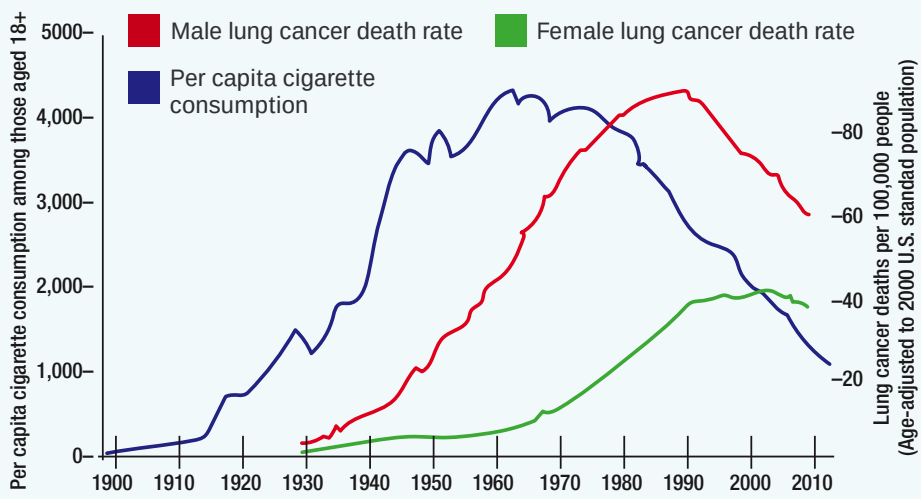
Cigarette Mortality Trends Relate to Today's Obesity Crisis

Rise and Fall of Cigarette Smoking 1900-2013



Department of Health & human Services. The Health Conequences of Smoking—50 Years of Prgress: A Report of the Surgeon General. 2014.

Lung Cancer Death Rates Surged 30 Years After Cigarette Growth



Death rates source: US Mortality Data, 1960-2010, US Mortality Volumes, 1930-1959, National Center for Health Statistics, Centers for Disease Control and Prevention.Cigarette consumption source: US Department of Agriculture, 1900-2007

Cigarette smoking was rare before year **1900,** but sharply increased thereafter. **Lung cancer deaths** did not begin to surge until around **1930** and continued increasing up until **1990**.

The delay in **lung cancer deaths** (from **1900** to **1930**) occurred while cigarette-smoking rates were surging. The situation reversed when cigarette smoking began declining around **1965**, but lung cancer deaths kept rising and did not peak until around **1990**. These delays reflect the number of years required for cigarette smoking to cause lung cancer. There are also adverse effects of *prior* smoking on **lung cancer** incidence.

A similar situation exists today with **overweight** and **obese** individuals who face short- and long-term health issues because of their **excess weight**.

Simple Steps Yield Huge Benefits

In response to the plague of **diabetic disorders** striking Americans, several studies were initiated to evaluate whether **cardiovascular events** could be reduced with modest risk-factor changes.

When *only* aggressive **glycemic control** is instituted in **type II diabetics**, there are usually negligible reductions in heart attack and stroke risk.

This is not surprising when considering that a **diagnosis** of **diabetes** often occurs with other co-morbid conditions like hypertension and elevated lipids.

Published data show that when diabetics control other risk factors, like high blood pressure and elevated LDL cholesterol, there are marked reductions in cardiovascular risk.

For example, a group of 2,018 diabetics were treated to achieve safer ranges of **blood pressure**, **hemoglobin A1c** (blood marker of long-term **glucose** control) and **LDL cholesterol**.[23]

In those who achieved one or more of the three targeted ranges of:

- **Blood pressure**
- **LDL cholesterol**
- **Hemoglobin A1c…**

…there was an incremental lower adjusted rate of cardiovascular events. In other words, with each additional treatment goal met, cardiovascular risk *decreased* further.

The chart below shows the **percent of risk reduction** in response to targeting one risk factor (such as blood pressure), two risk factors, or all three risk factors (**blood pressure**, **LDL**, and hemoglobin **A1c**) vs. none:

Targeting →	One Risk Factor	Two Risk Factors	Three Risk Factors
Cardiovascular Disease Events	-36%	-52% (Risk reductions)	-62%
Coronary Heart Disease Events	-41%	-56% (Risk reductions)	-60%

This table shows a **60%** coronary-event risk reduction when all three risk factors are controlled.

This prompted the study's authors to note how uncommon it is for **diabetics** to have all three risk factors in safe ranges.

They concluded that **optimization** of these risk factors is:

"…associated with substantially lower risk of coronary heart disease and cardiovascular disease."

Cardiovascular disease events include **stroke** and **heart attack**.

This study indicates that many lives can be spared if basic, conventional risk factors, especially blood pressure and lipids are better controlled.

Critical Need of Comprehensive Therapy

There is a lack of consistent data on treating diabetics with **intensive glycemic control** alone.

While **aggressive glycemic control** by itself lowers risk of **kidney failure**, **neuropathy**, and **retinopathy**, the risk of **heart attack** and **stroke** are typically not reduced.

For example, a clinical trial of Danish **type II diabetics** compared intensive **multi-modal** therapy to **conventional therapy** for a mean treatment period of 7.8 years.[24]

The **intensive therapy** targets were:

Blood Marker	Intensive Therapy Targets
Hemoglobin A1c →	Under **6.5%**
Total Cholesterol →	Under **175 mg/dL**
Triglycerides →	Under **150 mg/dL**
Blood Pressure →	Under **130/80 mmHg**

The **intensive**, **comprehensive therapy** group had a **57%** reduction in **cardiovascular disease death** and a **59%** reduction in **cardiovascular disease event**s.

A much larger, five-year study of 859,617 diabetic adults in the United States showed inadequate **risk factor control** to be responsible for **11%** to **34%** of **cardiovascular disease events.**[25]

The defined "**risk factors**" in this five-year study were **blood pressure**, **LDL**, **hemoglobin A1c,** and **smoking**.

Another study looked at similar risk factors for American **type II diabetics** and projected that controlling all of them would prevent **35%** of **coronary heart disease events** in **men** and **45%** in **women**.[26] The authors concluded:

"…a significant proportion of coronary heart disease events in adults with type II diabetes could be prevented from composite control of risk factors often not at goal."[26]

The data relating to heart attack and stroke prevention reveal that **diabetics** need to control more than just **glucose** and **hemoglobin A1c** levels.

What About Obese Individuals?

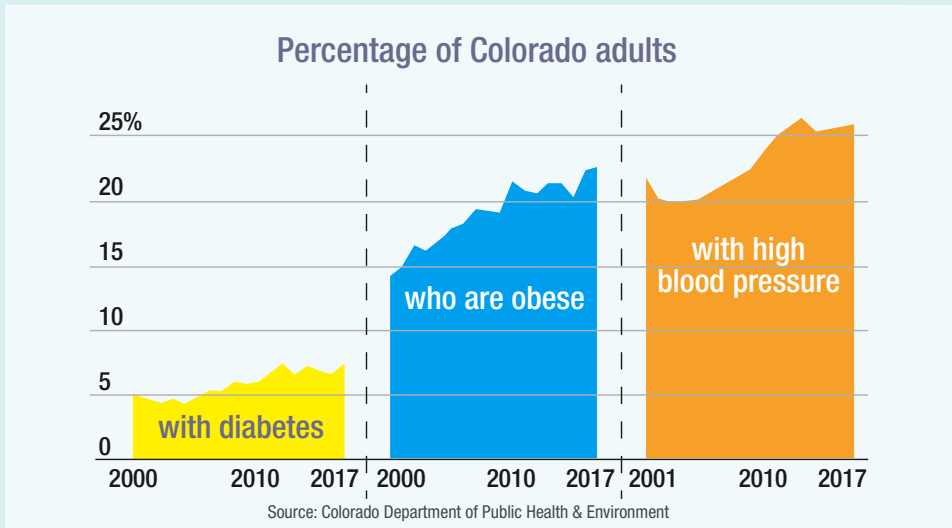
In a **2016** report published in ***JAMA***, Johns Hopkins researchers followed a group of 13,730 people for about 23 years.[27]

Body Mass Index of this large study group ranged from normal weight (BMI **18.5 to <25 kg/m²)** to severely obese (equal to or more than **35 kg/m²**).

After controlling for factors like age, smoking status, and physical activity, severely **obese** subjects had about a **two-fold** higher risk of **coronary heart disease** and **ischemic stroke**.

The box below reveals the surge in cardiovascular risk factors in **Colorado**, a state associated with healthier behavioral patterns than the southeast United States.

Heart Disease in Middle-Aged Men



A front-page article in the ***Wall Street Journal*** described surging numbers of **heart attacks** occurring in people living in **Colorado**, many of whom are physically active, but nonetheless have multiple **cardiovascular risk** factors.[28]

The article described many victims including a 55-year-old man who died of an acute heart attack. This prompted his group of friends to have checkups. Eleven of his friends had **arterial issues** and needed stents or other therapy.

Six of these 11 men with silent **coronary artery disease** played on an amateur hockey team. This was common amongst other Coloradoans who were **physically active**, but failed to control blood pressure, lipids/glucose, body weight and other heart-health practices.

A startling statistic discussed in the ***Wall Street Journal*** article portends a frightening future: More than **25%** of elementary-school children screened in the **2018-2019** school year were overweight or **obese**. And **19.2%** had borderline or high cholesterol.

High LDL cholesterol and its atherogenic subfractions, like **apolipoprotein B,** in early life predispose to vascular diseases in mid- to later life.[29,30]

A Colorado Springs cardiologist was quoted as regularly seeing men and women in their **30s** and **40s** with heart problems, such as high blood pressure, irregular heart rhythms, and heart attacks. This doctor noted how **rare** this was when he began his cardiology practice in the early **2000s**.

Cardiovascular screening is now urged by public health officials, which is what most readers of ***Life Extension***® magazine do each year with comprehensive **blood tests**.

When the researchers of this 2016 *JAMA* study controlled for:

- **Diabetes**,
- **Hypertension**,
- **Cholesterol/triglycerides**, and
- **Kidney function**...

...there was no longer a difference between **obese** and **normal weight** people for risk of **coronary heart disease** and **stroke**.

While this is encouraging, the researchers discovered that severely **obese** individuals had a nearly **four-fold** increase in **heart failure**, even when conventional risk factors (like blood pressure, glucose, and lipids) were considered.

The researchers pointed to evidence that excess **body weight** increases the heart's workload. They also pointed to the role of fat cells in the belly (abdomen) releasing **inflammatory** factors that further damage the heart.

None of these studies measured critical additional blood factors that contribute to coronary artery disease, ischemic stroke, and heart failure.

If these added artery-clogging factors (like **C-reactive protein** and **apolipoprotein B**) were measured in type II diabetics and/or obese individuals, there would be an opportunity for more substantial reductions in cardiovascular diseases.

Too Many Needless Deaths

The studies reported in this editorial looked at **conventional** cardiovascular risk factors in overweight and diabetic individuals.

Up to **62%** lower rates of **cardiovascular events** occurred in diabetics who achieved better control over their blood pressure, lipids, and blood sugar.

But what about the **38%** risk for cardiovascular events that remained, even after controlling conventional risk factors?

As a reader of this magazine, you know there are about a dozen additional cardiovascular factors such as **homocysteine**, **apolipoprotein B**, and **hormone imbalances**.

These **blood markers** should be measured, and efforts made to reduce them to safe ranges. This will likely yield greater reductions in cardiovascular events.

What Are Optimal Blood Levels of Apolipoprotein B?

Those with *higher* levels of a blood marker called **apolipoprotein B** are at greater risk for cardiovascular events.

For people without preexisting vascular disease, diabetes or other risk factors, optimal apolipoprotein B is under **80 mg/dL**.

Those at high **arterial blockage** risk should attempt to reduce **apolipoprotein B** to under **60 mg/dL**. This will likely require dietary modifications and use of certain drug therapies.

When it comes to ideal **apolipoprotein B** levels, the lower the better. The following reference ranges reflect **Life Extension's** general guidance for **apolipoprotein B** status when you get your blood test results back:

Optimal	**<80 mg/dL** (For those without significant vascular risk factors) **<60 mg/dL** (For those with significant vascular risk factors)
Borderline	**80-99 mg/dL**
High	**100-120 mg/dL**
Very High	**≥120 mg/dL**

If your **apolipoprotein B** levels are not in **optimal** ranges, there are natural and pharmaceutical approaches to lowering them.

Now that cardiovascular disease is making a deadly comeback, it is imperative to have **comprehensive blood tests**, which is what most readers of this magazine do each year when they order the popular **Male** or **Female Panels**.

Annual Lab Test Sale

The high cost of **blood tests** prevents many people from testing for, and then optimizing, their cardiovascular risk factors.

We at **Life Extension**® recognized this problem **25 years ago**.

Back in those days, many of our readers were challenged to persuade their doctors to order tests like **homocysteine** and **hemoglobin A1c**.

The price of blood tests in the **1990s** was far ***higher*** than today.

This motivated us to develop a program that enables readers to order **low-cost** tests and then visit a **blood draw station** in their area at their convenience.

Blood test results come back in less than a week and are promptly **emailed** and **mailed**.

If there are any questions, our **Wellness Specialists** are available to assist, seven days a week, at no charge.

Once a year we **discount** prices of all lab tests. This serves as a convenient reminder to have one's annual assessments performed at the lowest prices.

The extensive array of blood tests included in the **Male** and **Female Panels** can be viewed on the page to your right.

The discounted price for this year's **Male** or **Female Blood Panels** (that includes **apolipoprotein B** and *newly* added **ferritin)** is **$224**. It's a bit higher now than in years past, but it includes more important measures that cost over **$2,000** at commercial labs.

To order the Male or Female Panel today, call **1-800-208-3444** or log on to: **www.LifeExtension.com/blood**

You can then visit a blood draw station we refer you to in your area at your convenience.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

(References can be found on page 16.)

Blood Tests Identify Reversible Cancer Risks

Most people have annual blood tests to check for cardiovascular risk factors like total **cholesterol**, **LDL** and **triglycerides**.

What few realize is that other blood tests such as **fasting insulin**,[31-34] **glucose**,[35-39] and **C-reactive protein**[40-45] are robustly associated with one's future **cancer** risk.

Those who procrastinate about having **comprehensive blood tests** miss out on opportunities to correct risk factors before onset of cancer, dementia. kidney failure and cardiovascular diseases.

Blood Test Super Sale

Since our founding over 40 years ago, ***Life Extension***® has urged its readers to have annual **blood tests**.

The number of lives saved by our recommendations is huge, including men diagnosed with *early*-stage **prostate cancer** who are readily cured. And many of today's curative prostate treatments have far fewer side effects.

We have identified tens of thousands of people with elevated **cardiovascular risk** markers, allowing them to take corrective measures before an ischemic **stroke** or **heart attack** strikes.

The retail price throughout the year for these comprehensive **Male** or **Female Panels** is **$299**. These same tests at commercial labs cost over **$2,000**.

Just once a year, we discount the prices of all blood tests, enabling readers to obtain the **Male** or **Female Blood Test Panels** for only **$224**.

This represents almost a **90% savings** compared to commercial lab prices.

To order a **Male** and/or **Female Panel** at the year's lowest prices, call **1-800-208-3444** (24 hours) or log on to: **www.LifeExtension.com/blood**

Comprehensive Blood Tests at Low Lab Sale Prices

Commercial labs charge **over $2,000** for **blood tests** needed to evaluate cardiac, inflammatory, immune, and other degenerative risk factors.

Life Extension® offers these same tests for **$224** when the **Male** or **Female Panel** is ordered during the annual **Lab Test Sale.** This represents a savings up to **90%** compared to commercial labs.

This year **ferritin** has been added to the **Male** and **Female Panels** at no additional charge.

MALE PANEL

METABOLIC PROFILE
Glucose
Insulin
Hemoglobin A1c
NEW **Ferritin** (measure of iron status)
Serum Magnesium
Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
Blood proteins: albumin, globulin, total protein, albumin/globulin ratio

CARDIAC MARKERS
Apolipoprotein B (ApoB)
Homocysteine
C-Reactive Protein (high sensitivity)

LIPID PROFILE
Total Cholesterol
LDL (low-density lipoprotein)
HDL (high-density lipoprotein)
Triglycerides

COMPLETE BLOOD COUNT (CBC)
Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
Platelet count

CANCER MARKER
PSA (Prostate Specific Antigen)

HORMONES
Free and Total Testosterone
DHEA-S
Estradiol (an estrogen)
TSH (thyroid function)
Vitamin D

FEMALE PANEL

METABOLIC PROFILE
Glucose
Insulin
Hemoglobin A1c
NEW **Ferritin** (measure of iron status)
Serum Magnesium
Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
Blood proteins: albumin, globulin, total protein, albumin/globulin ratio

CARDIAC MARKERS
Apolipoprotein B (ApoB)
Homocysteine
C-Reactive Protein (high sensitivity)

LIPID PROFILE
Total Cholesterol
LDL (low-density lipoprotein)
HDL (high-density lipoprotein)
Triglycerides

COMPLETE BLOOD COUNT (CBC)
Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
Platelet count

HORMONES
Progesterone
Estradiol (an estrogen)
Free and Total Testosterone
DHEA-S
TSH (thyroid function)
Vitamin D

LAB TEST SALE • ENDS JULY 12, 2021

LIFE EXTENSION®

Regular price: $299
Sale Price: $224

To obtain these comprehensive Male or Female Panels at these low prices, call 1-800-208-3444 or log on to www.LifeExtension.com/blood to order your requisition forms.

After you order and receive our form, you can visit a blood-draw facility we suggest at your convenience in your area or the **Life Extension Nutrition Center** in Ft. Lauderdale.

Lab tests are available in the continental United States and Anchorage, AK, only. Not available in Maryland. Restrictions apply in MA, NY, NJ, and RI. Kits not available in PA. The Blood Test Super Sale expires on **July 12, 2021**.

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HEALTHY BONES = HEALTHY HEART

THREE WAYS TO GET VITAMIN K

SUPER K

SUPER K is the best-selling **vitamin K** formula for bone and heart health. It costs only **25 cents** a day and provides in one capsule:

Vitamin K1 (converts to K2 in some people)	**1,500 mcg**
Vitamin K2 (MK-4) (for bone & vascular health)	**1,000 mcg**
Vitamin K2 (MK-7) (long-acting protection)	**100 mcg**

SUPER K Item #02334 • 90 softgels

1 bottle **$22.50** • 4 bottles $20.25 each

SUPER K ELITE

Super K Elite provides 2 additional forms of vitamin K and even ***higher*** potencies of K1, MK4, and MK7. **Super K Elite** costs **60 cents** a day and provides in one capsule:

Vitamin K1 (converts to K2 in some people)	**2,000 mcg**
Vitamin K2 (MK-4) (for bone & vascular health)	**1,500 mcg**
Vitamin K2 (MK-7) (long-acting protection)	**181 mcg**
Vitamin K2 (MK-9) (added cardiovascular support)	**43 mcg**
Vitamin K2 (MK-6) (added cardiovascular support)	**11 mcg**

SUPER K ELITE Item #02335 • 30 softgels

1 bottle **$18** • 4 bottles $16 each

MEGA VITAMIN K2

Japanese physicians use ***high-dose* vitamin K2** for those with challenges in maintaining healthy bone density. **Mega Vitamin K2** costs **95 cents** a day and provides in one daily capsule:

Vitamin K2 (MK-4) (for bone & vascular health)	**45,000 mcg**

MEGA VITAMIN K2 Item #02417 • 30 capsules

1 bottle **$28.50** • 4 bottles $26 each

For full product description and to order these **VITAMIN K** formulas
call 1-800-544-4440 or visit www.LifeExtension.com

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CAUTION: If you are taking anticoagulant or antiplatelet medications, or have a bleeding disorder, consult with your healthcare provider before taking these products.

RE-ENERGIZE
Heart
AND
Brain Cells

Three Choices of Superior **Ubiquinol CoQ10** Mitochondrial Delivery Systems

100 mg CoQ10

Item #01426 • 100 mg, 60 softgels

1 bottle **$46.50**

4 bottles $39 each

200 mg CoQ10

Item #01431 • 200 mg, 30 softgels

1 bottle **$44.25**

4 bottles $37.50 each

100 mg CoQ10 + 10 mg PQQ

Item #01733 • 100 mg, 30 softgels

1 bottle **$37.50**

4 bottles $30 each

For full product description and to order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support**, or **Super Ubiquinol CoQ10 with PQQ**, call 1-800-544-4440 or visit www.LifeExtension.com

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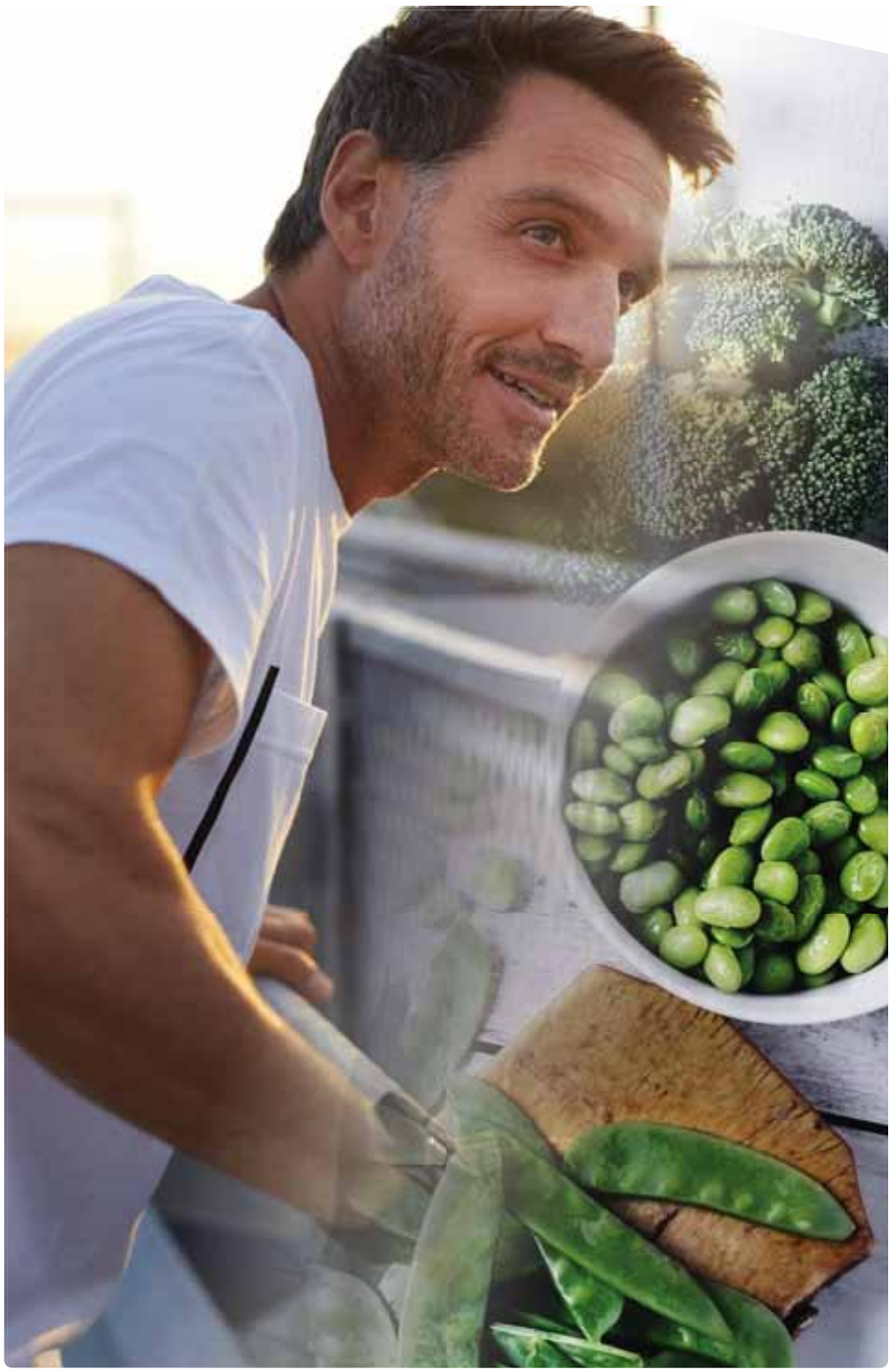
In the News



Higher Folic Acid Levels Linked to Lower Risk of Erectile Dysfunction

A meta-analysis documented an association between *higher* serum levels of **folic acid** and a lower risk of erectile dysfunction (ED).*

Researchers selected 6 studies that included 1,842 men.

Pooled data revealed that folic acid levels among men without ED were approximately **3.37 ng/mL** *higher* than levels measured among men with ED.

The folic acid difference between participants with and without ED became greater as severity increased, meaning those with lower folic acid levels exhibited worsening ED.

Editor's Note: The authors remarked that folic acid helps normalize homocysteine levels that damage the lining of the arteries. Elevated homocysteine levels also inhibit the formation of nitric oxide in the blood vessel lining, thereby contributing to the risk of ED.

* *Andrologia.* 2021 Feb 7.

AMPK Activation Can Help Maintain Muscle Mass

Research conducted at the University of Birmingham in the UK indicates that activation of an energy-sensing enzyme known as AMP-activated protein kinase (**AMPK**) could help people maintain physical function.*

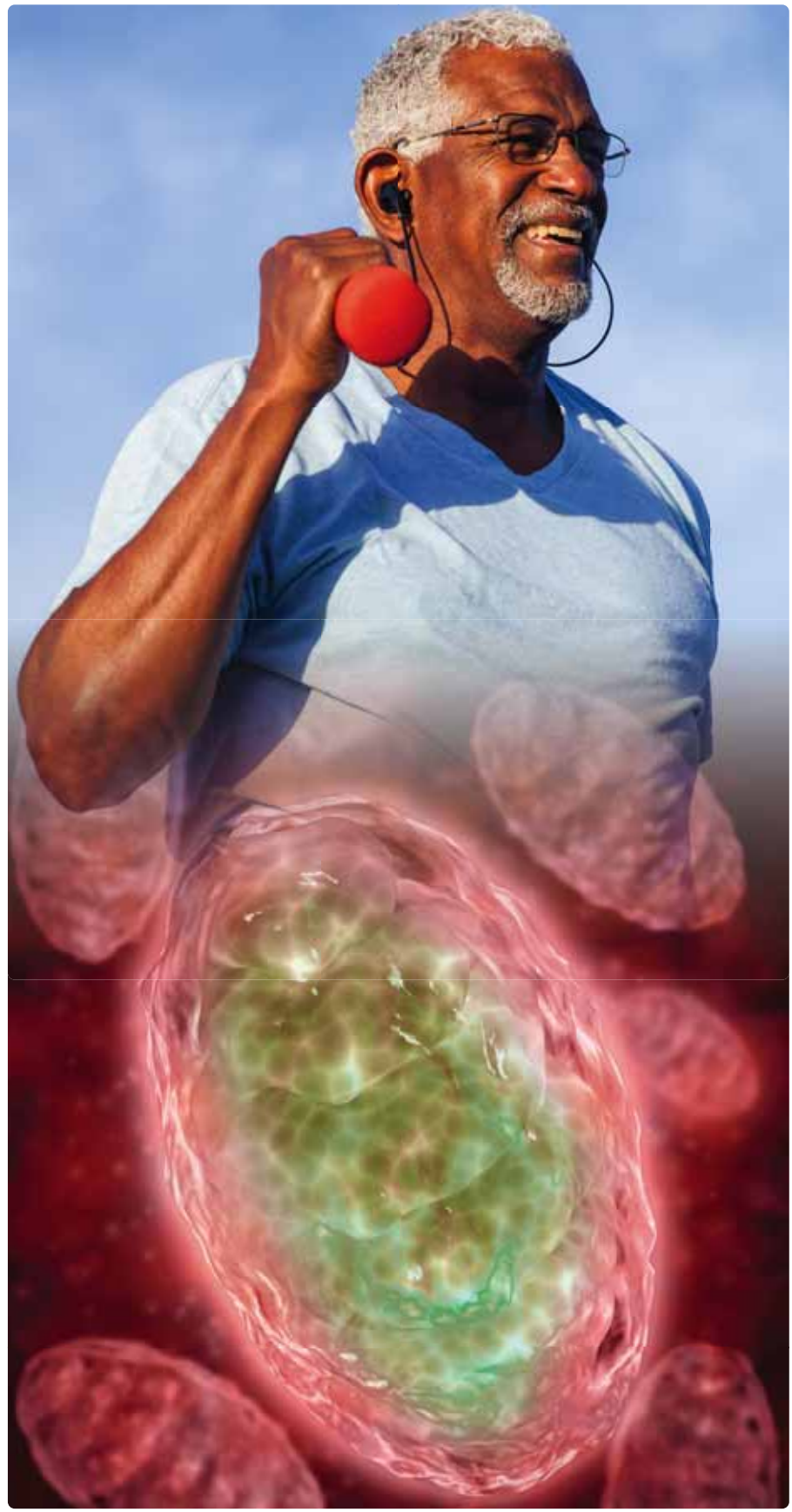
Researchers were able to observe that **AMPK** promotes the breakdown of damaged mitochondria, a process known as mitophagy.

Aged or damaged mitochondria that build up in the muscle cells of older individuals contribute to a decline in muscle function.

"We know that exercise and diet regimes can be used to help people maintain their muscle mass and physical capabilities in later life," observed lead author Alex Seabright. "But improving our understanding as to why muscle loss occurs with aging will aid the development of targeted pharmacological interventions to help people to stay physically capable for longer."

Editor's Note: "The rationale for this study stemmed from our lack of current knowledge concerning the molecular mechanisms that underpin mitophagy in skeletal muscle," the authors stated.

* *FASEBJ.* 2020 Mar 22; 34(5): 6284–6301.



CoQ10 Improves Statin Tolerability

Results from a study published in the journal *Drug Design, Development and Therapy* indicate a potential protective effect of **CoQ10** against a side effect induced by statin drugs that would otherwise render treatment intolerable.*

The randomized trial included 60 participants with unhealthy LDL levels and statin-associated muscle pain.

In addition to **pain** scores, a blood marker (CPK) of **muscle damage** was used to assess **statin intolerance**.

Statin use was discontinued for a month, followed by the reintroduction of **half** the previous statin dose plus **100 mg** CoQ10 or a placebo, daily for three months. Questionnaires concerning pain symptoms were administered at the beginning of the study and at one and three months.

CoQ10 levels were higher and **pain scores** were lower after three months in the CoQ10 group. Pain scores remained essentially the same among those who received the **placebo**.

Higher plasma levels of **CoQ10** were associated with lower levels of **CPK** among participants who received the CoQ10.

Editor's Note: The authors remarked that, "CoQ10 was safe and effective in preventing the worsening of the lipid profile that would be expected with a reduced dosage of statin."

* *Drug Des Devel Ther.* 2019 Oct 21;13:3647-3655.

Anti-Inflammatories Can Have Antidepressant Effects

Men and women with major depressive symptoms were found to benefit from anti-inflammatory compounds, according to the results of a meta-analysis published in the *Journal of Neurology*.*

For their analysis, researchers selected 30 randomized, controlled trials that included a total of 1,610 participants. The trials evaluated the effects of nonsteroidal anti-inflammatory drugs (NSAIDS), omega-3 fatty acids, minocycline antibiotics, pioglitazone, modafinil (used in sleep disorders), statin drugs, and N-acetylcysteine, all of which have an anti-inflammatory effect.

Twenty-two trials compared the effects of antidepressant drug therapies plus the anti-inflammatory compounds to antidepressant drug therapy plus a placebo, and eight trials compared the anti-inflammatory compounds alone to a placebo.

Pooling of the results of 26 of the trials revealed a **55%** reduction in depressive scale scores for people who received the anti-inflammatory compounds compared to those who got a placebo. Further analysis determined that NSAIDs, omega-3 fatty acids, statins and minocyclines had the greatest antidepressant effects.

Editor's Note: "Our systematic review and meta-analysis suggests that anti-inflammatory agents exert an antidepressant effect in the treatment of major depressive disorder and were generally safe, with rates of adverse effects similar to those of placebo," the authors concluded.

* *J Neurol Neurosurg Psychiatry.* 2020 Jan;91(1):21-32.

Prediabetes Linked to Cognitive Decline and Dementia

People with higher than normal blood sugar—called *prediabetes*—are more likely to experience cognitive decline and vascular dementia, according to a study published in *Diabetes, Obesity, and Metabolism*.*

Researchers analyzed UK Biobank Data from almost 450,000 people averaging 58 years old who underwent an **HbA1C test**, which determines average blood sugar levels over the past two to three months.

Based on these results, they were divided into one of five groups: low-normal blood sugar, normal blood sugar, prediabetes, undiagnosed diabetes, and diabetes. Prediabetes was classified as having a **hemoglobin A1c** (HbA1C) blood test reading of **6.0%-6.5%**. (Ideal **A1c** levels are under **5.5%**.)

Results showed that people with above *normal blood sugar* levels were:

- **42%** more likely to experience **cognitive decline** over four years, and
- **54%** more likely to develop **vascular dementia** over eight years.

Vascular dementia is caused by reduced blood flow to the brain.

People with prediabetes and diabetes had similar rates of cognitive decline (**42%** and **39%** respectively).

MRI brain scans revealed that **prediabetes** was associated with a smaller hippocampus and more strongly associated with having lesions on the brain—both of which are associated with age-related cognitive impairment.

Editor's Note: The study authors noted, "Previous research has found a link between poorer cognitive outcomes and diabetes, but our study is the first to investigate how having blood sugar levels that are relatively high—but do not yet constitute diabetes—may affect our brain health."

* *Diabetes Obes Metab*. 2021;1-10.

THiNK ZiNC
FOR BONE HEALTH

You know zinc is good for you—but are you getting enough?

If you don't know by now that zinc promotes a healthy immune response and bone health, it's time to get with the program. This formula gives you **50 mg** of zinc in a convenient, vegetarian capsule. Promotes bone, immune, heart, and neurological health with Zinc Caps. **What a good idea!**

Item #01813

50 mg • 90 vegetarian capsules

1 bottle **$6.75** • 4 bottles $6 each

GLUTEN FREE

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

OptiZinc® is a registered trademark of InterHealth Nutritionals, Inc.

45 Times Greater Bioavailability

Curcumin

Patented **turmeric extract** (500 mg) results in **45 times** greater bio-availability of free curcuminoids.

Item #02407

500 mg, 60 vegetarian capsules

1 bottle **$24** • 4 bottles $22 each

Same 500 mg potency patented **turmeric extract** with added benefits of ginger and other turmeric actives.

Item #02324

500 mg curcumin + gingerol, 30 softgels

1 bottle **$20** • 4 bottles $18 each

GLUTEN FREE

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For full product description and to order **Curcumin Elite™** or **Advanced Curcumin Elite™**, call 1-800-544-4440 or visit www.LifeExtension.com

BEAT BELLY FAT WITH AMPK

Studies show that *increasing* AMPK activity encourages cells to stop storing fat.

AMPK Metabolic Activator helps trigger cellular AMPK, enabling your body to burn unwanted fat—particularly around your abdomen.

Item #02207 • 30 vegetarian tablets

1 bottle **$28.50** • 4 bottles $24 each

For full product description and to order **AMPK Metabolic Activator**, call 1-800-544-4440 or visit LifeExtension.com

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1 DAILY

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

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

Maintain Youthful HOMOCYSTEINE LEVELS

FOR BRAIN, HEART, AND HEARING HEALTH

Homocysteine Resist supports healthy levels of homocysteine, an unfavorable amino acid that can increase with normal aging.

Item #02121 • 60 vegetarian capsules

1 bottle **$19.50**

4 bottles $17.50 each

Just <u>one</u> daily capsule of **Homocysteine Resist** provides:

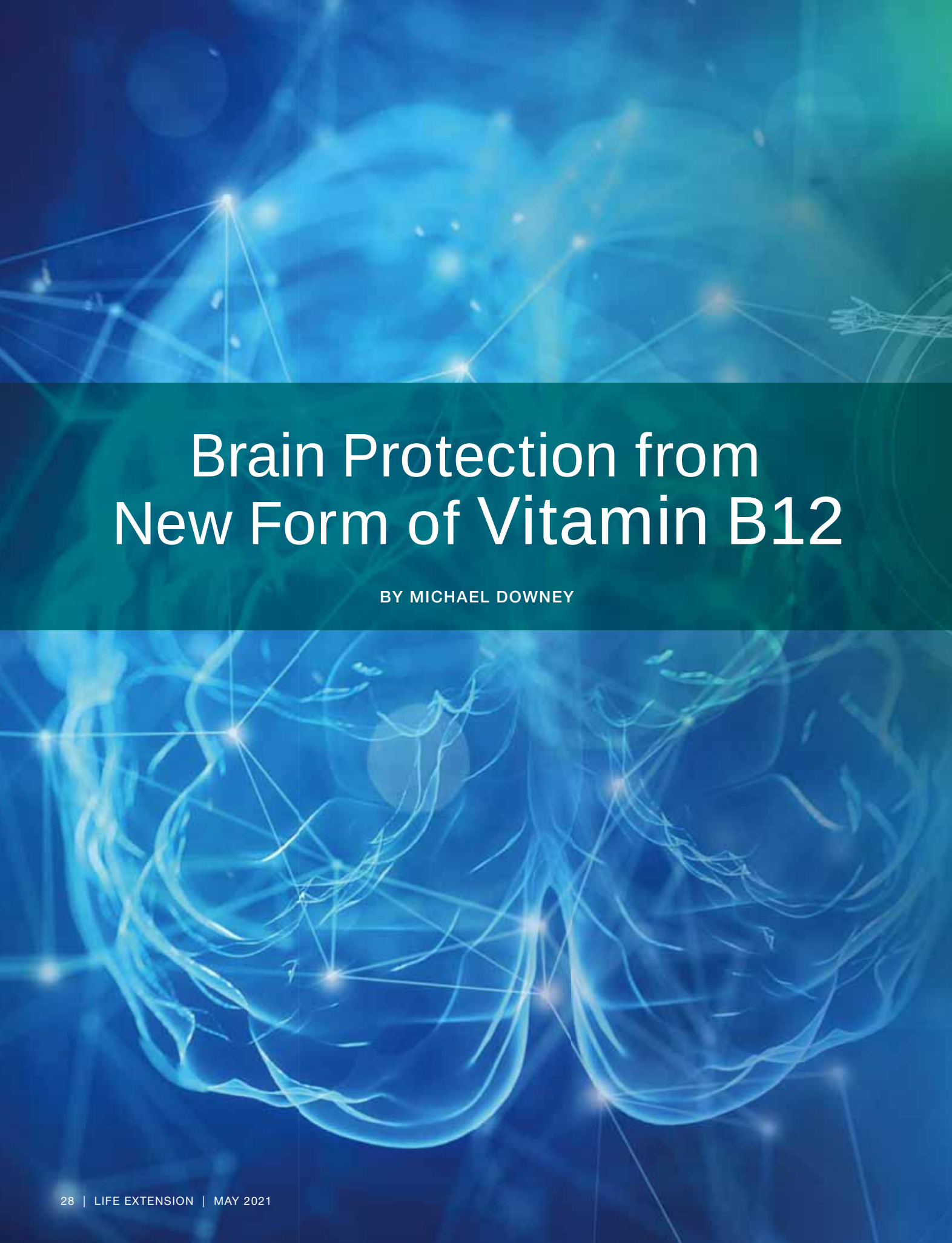
5-MTHF (activated folate)	8,500 mcg[o]
Methylcobalamin (activated vitamin B12)	1,000 mcg
Pyridoxal 5'-phosphate (activated vitamin B6)	100 mg
Riboflavin (vitamin B2)	25 mg

[o]DEF (Dietary Folate Equivalents)

CAUTION: Do not use this product if treated with methotrexate, fluorouracil, phenytoin, phenobarbital, primidone, or levodopa prior to consultation with your healthcare provider.

GLUTEN FREE · 1 DAILY · NON GMO LE CERTIFIED

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



Brain Protection from New Form of Vitamin B12

BY MICHAEL DOWNEY

People with **vitamin B12** deficiencies frequently suffer anemia, weakness, and fatigue.

But there are more dangerous effects.

Low **vitamin B12** levels have been associated with progressive **brain atrophy** (shrinkage).

One study found an astounding **517%** greater rate of **brain** volume loss in people with lower vitamin B12 than those with *higher* B12 levels.[1,2]

Even B12 levels in the "low normal" range are associated with **cognitive impairment**.[3]

Many people already take **methylcobalamin**, one of two **bioactive** forms of vitamin B12, in their multivitamin.

But the *other* active B12 form—**adenosylcobalamin**—has unique properties that methylcobalamin does not.

New *in-vitro* research shows that **adenosylcobalamin** can **protect neurons** and prevent a decline in levels of the critical neurotransmitter, **dopamine**.[4]

A combination of both active forms of **vitamin B12** offers protection for aging brain cells.

Activated Forms of Vitamin B12

Vitamin B12 is essential for nerve function, cell metabolism, the formation of red blood cells, and DNA health.[5-7]

Vitamin B12 is found in animal sources, including meat, fish, poultry, eggs, and dairy products. Because of this, **vegans** and some **vegetarians** are at higher than average risk of developing vitamin B12 deficiency.[8]

B12 becomes more difficult to absorb as we age. This is one reason ***older* people** often have *lower* levels in the body.[9,10]

Vitamin B12 exists in various forms called cobalamins. The two active forms of cobalamins used by enzymes in the body are:[11]

- **Methylcobalamin**, which is active in the ***cytosol*** (liquid) inside the body's cells, and
- **Adenosylcobalamin**, which is active in the ***mitochondria***, the fuel plants within each cell.

Adenosylcobalamin is the most prevalent form of vitamin B12 in human tissues, making up as much as **70%** of all forms of this vitamin in the body.[11] But it is missing from most B12 formulas and multivitamins.

The B12 Link to Neurodegeneration

Up to **one million** Americans suffer from **Parkinson's disease**, a degenerative disease of the central nervous system. Roughly **60,000** new cases are diagnosed ***each year***. The risk increases after age 50, but about **4%** of patients are diagnosed before then.[12,13]

Common symptoms include tremors, muscle rigidity, slowness and difficulty with movement, poor balance, sleep disturbances, loss of coordination, cognitive decline, and—in very advanced cases—dementia.

Mitochondrial dysfunction has been identified as a central feature of Parkinson's disease.[14-16]

Since the **adenosylcobalamin** form of **vitamin B12** supports **mitochondrial** function, scientists reasoned that it might help treat Parkinson's.

They made some remarkable discoveries.

Inhibiting Neurodegeneration

To investigate the therapeutic potential of **adenosylcobalamin**, scientists performed a series of experiments in *in-vitro* models, worms, and mice.

They administered this unique form of B12 to the larvae of worms that carried a mutation linked to **Parkinson's disease**.[4]

Worms with this mutation suffer from **abnormal movement control**. But mutated worms that had been treated with adenosylcobalamin as larvae were able to move ***normally*** as adults.[4]

Worms with the Parkinson's mutation experience accelerated degeneration of their **dopamine-producing neurons**.

As a result of this neurodegeneration, less than **60%** of these nervous system cells remained in *untreated* mutated worms after nine days of life. But in mutated worms that had been treated with **adenosylcobalamin**, close to **75%** of these neurons survived after the same period.[4]

This near **75% *neuron survival rate*** matched the percentage of neurons that survived in worms without the Parkinson's mutation.

Preventing Decreases in Dopamine

Scientists next studied the specific effect of **adenosylcobalamin** treatment on **dopamine** levels in mice with this mutation.

For this experiment, scientist prepared brain slices of these mice and treated them with adenosylcobalamin.

Then, every two minutes for 20 minutes, they stimulated the dopamine-producing neurons.[4]

At the end of the 20-minute period, the stimulated neurons of the *control* slices were releasing **20% *less dopamine***.

But the brain slices treated with **adenosylcobalamin** exhibited *sustained* **dopamine** levels, showing dopamine output ***equal*** to that of animals without the mutation.[4]

Taken together, these findings suggest that adenosylcobalamin could prevent dopamine loss, brain cell depletion, and neurotoxicity.

WHAT YOU NEED TO KNOW

Active Forms of Vitamin B12 Protect the Brain

- **Vitamin B12** is critical for nerve function, cell metabolism, the formation of red blood cells, DNA production, and more.
- Aging, and vegan or vegetarian people often suffer from vitamin B12 **deficiency**. Oral supplementation can correct this.
- There are two active forms of vitamin B12—**adenosylcobalamin** and **methylcobalamin**. *The body needs both* forms.
- The better-known form of the two, **methylcobalamin**, is used to reduce stress, lower dangerously elevated levels of homocysteine, and treat conditions including nerve damage.
- Animal data now show that **adenosylcobalamin** uniquely protects brain neurons, prevents a decline in **dopamine** levels, and may block neurodegeneration.
- Initial findings suggest that adenosylcobalamin inhibits overactivity of an enzyme linked with **Parkinson's disease**.
- Daily oral intake of **500 mcg** of **adenosylcobalamin** and **500 mcg** of **methylcobalamin** is a great choice for whole-body health *and* potential defense against neurodegeneration.

Importance of Methylcobalamin

Adenosylcobalamin shouldn't *replace* **methylcobalamin** in a supplementation program. Instead, they should be used together for maximum benefit.

Methylcobalamin is a form of vitamin B12 that is active in the **central nervous system**, and it is essential to the growth and replication of cells.[5-7]

Protecting brain cells against **neurodegeneration** is critical for aging individuals seeking to maintain their cognitive function.

Several studies have connected **homocysteine** to negative effects on the brain and brain vasculature.[17,18] Elevated homocysteine has been associated with as much as a **10.5-fold** greater risk of **vascular dementia**, and to brain shrinkage.[1,19-21]

Homocysteine has been tied to destructive effects that can accompany aging. These include chronic inflammation, atherosclerotic plaque, shrinkage of brain areas (e.g., hippocampus) involved in memory formation, development of beta-amyloid plaque, and hindrance of the DNA repair needed for brain cell maintenance.[21-28]

Methylcobalamin *lowers* homocysteine, which helps protect against these effects.[29,30]

This new pre-clinical evidence suggests that *adding* **adenosylcobalamin**, the other active form of vitamin B12, may provide additional protection for brain cells and help prevent a decline in dopamine levels.

Daily oral dosages of **500 mcg** of **adenosylcobalamin** and **500 mcg** of **methylcobalamin** can help provide broad protection of both body and brain.

Summary

There are two bioactive forms of vitamin B12, **adenosylcobalamin** and **methylcobalamin**. Your body needs both to function youthfully and optimally. Together, these are the best forms of vitamin B12.

Many people already take the **methylcobalamin** form of B12 based on data showing it is essential for proper DNA synthesis, red blood cell formation, cell growth, and more.

But the **adenosylcobalamin** form is active in the **mitochondria**, the powerhouses of the cells.

A preclinical study has shown it has the ability to protect brain neurons and to prevent a decline of the neurotransmitter **dopamine** in animal models.

Vegans, vegetarians, and the aging often develop vitamin B12 deficiencies. Oral intake of *both* active forms of vitamin B12 can support brain and body health. •

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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Many People—Especially the Elderly—Are Deficient in Vitamin B12

Many people are deficient in **vitamin B12**, and other B vitamins, for multiple reasons.

For instance, some circumstances either boost the body's demand for B vitamins or greatly inhibit vitamin B absorption, making supplementation necessary.

Individuals in the following categories have the greatest risk of a vitamin B12 deficiency. For these individuals, the need for a daily supplement can be much more critical.

ELDERLY

Many older adults experience a decline in their appetite, reducing their overall dietary intake of *all* B vitamins. Older individuals may also be unable to *absorb* naturally occurring vitamin B12. With age, many people develop a loss of certain important functions of the stomach and digestive tract. This includes a *decreased* production of stomach acid, an intrinsic factor needed to release B12 from foods, and for its absorption in the small intestine.[31,32]

CERTAIN MEDICATIONS

Commonly prescribed drugs that reduce stomach acid production (**proton pump inhibitors**) decrease absorption of vitamin B12.[33] Metformin, the popular diabetes drug, is known to interfere with the absorption of vitamin B12.[34,35] Birth control pills can also deplete B12 and other B vitamins.[36]

PREGNANCY

B vitamins, especially B12, are important for healthy fetal development. In breast-feeding or pregnant women, a deficiency of B12 can result in severe neurological damage or birth defects in the infant or fetus.[37,38]

SOME MEDICAL CONDITIONS

People suffering from alcoholism, hypothyroidism, anorexia, celiac disease, or Crohn's disease have a much greater risk of developing a deficiency in vitamin B12 and other B vitamins.[39-43] Weight-loss surgery also increases the risk of a deficiency in B vitamins.[44]

VEGETARIANS AND VEGANS

Because they avoid meat and animal products, vegans and strict vegetarians may be at risk of a vitamin B12 deficiency.[45]

This deficiency can lead to digestive disturbances, anemia and blood disorders, and fatigue. It can also affect the peripheral nerves. In later stages, it may target the spinal cord.[7,17,46]

All this can lead to impaired mental function, often manifesting as slower thinking, attention deficits, and memory lapses.[17]

Any of these factors make daily oral intake of **vitamin B12**—including *both* **methylcobalamin** and **adenosylcobalamin**—an important component of a comprehensive wellness program.

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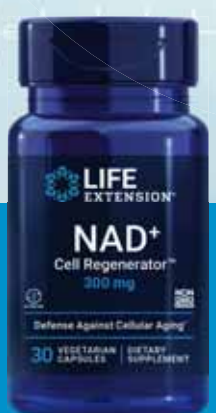

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Circumventing the Challenge of Middle-of-the-Night URINATION

BY MICHAEL DOWNEY

Waking up one or more times during the night to urinate is considered a normal part of life for older men.

It doesn't have to be.

Known as **nocturia**, it's more than just an annoyance.

It's associated with low-quality sleep, falls, heart disease, diabetes, and depression.[1]

Nocturia affects over **40 million** American men,[2] and most assume there's nothing they can do about it.

But scientists have identified ***five*** compounds that have demonstrated beneficial effects on nocturia and male **lower urinary tract** issues.[3-8]

In a **2020** clinical study by **Life Extension®**, the number of men suffering from **nocturia** was reduced by **64%**. And not a single participant was left waking up more than one time at night.[9]

This 2020 published study provides fresh scientific support for nutrients that support urinary health in aging men.

Common Male Urinary Symptoms

With age, men are prone to a spectrum of **lower urinary tract symptoms** related to the bladder, urethra, and prostate gland.

By age 80, as many as **70%** of men are affected.[10]

One of the causes is **enlargement of the prostate gland**, which is common in older age.[11] Other contributing factors include damage to the urethra, obesity, diabetes, high blood pressure, smoking, some medications, and nervous system disorders.[12]

Lower **urinary tract** symptoms can include increased urinary frequency, urgency, incontinence, incomplete bladder emptying, hesitancy, prolonged urination, dribbling, and weak urine stream.[13]

One of the most common symptoms is **nocturia**, the need to get up to urinate during the night, often more than once.[2,14]

Health Risks of Nocturia

Nocturia affects at least **half** of all men over age 50.[15] Clinically relevant **nocturia**, the need to urinate *twice or more* nightly, increases significantly with age, affecting up to **62%** of those aged 70-80.[14]

It can lead to serious health problems. A **quarter** of all falls by older individuals happen during the night, and a **quarter** of these are *directly related* to nocturia.[1]

In addition, over **40%** of people who have a nighttime awakening have trouble going back to sleep.[1] Nightly sleep disturbances caused by **nocturia** are associated with:[1,2,14,16,17]

- Heart disease,
- Diabetes,
- Obesity,
- Poor physical health,
- Cognitive dysfunction,
- Depression,
- Mood changes,
- Fatigue and exhaustion,
- Reduced quality of life,
- Impaired productivity, and
- Increased **overall mortality**.

Compounds that Target Nocturia

Medications often are meant to control bladder overactivity and urine-flow obstruction. This helps relieve the *daytime* urinary symptoms but may have little impact on nocturia.[18]

Some men are prescribed **alpha-blockers**, which can cause dizziness as a side effect, making them risky for elderly people.[1,19]

With the rapidly aging population, researchers have been searching for nutrients that can decrease or prevent nocturia.

They identified five compounds with urinary-health benefits:[9]

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

Beta-Sitosterol Helps Relieve Urinary Tract Symptoms

Beta-sitosterol is a plant compound isolated from the oils of certain vegetables and nuts.

Preclinical evidence indicates that beta-sitosterol possesses a broad range of **anti-inflammatory** properties.[20-23]

In an animal model, beta-sitosterol inhibits **5-alpha-reductase**, an enzyme in the prostate gland that converts testosterone to a more powerful growth-promoting hormone, **dihydro-testosterone**.[24]

In clinical studies of men with **prostate enlargement**, **beta-sitosterol** improves urinary symptoms. A randomized, double-blind, placebo-controlled study found that beta-sitosterol reduced urinary symptom severity by **50%** and improved quality-of-life scores by **42%**.[3]

Pygeum Bark Helps Reduce Nighttime Urination

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

In France, **Pygeum extract** has been given to patients suffering from **benign prostatic hypertrophy** (**BPH**), enlargement of the prostate, since the 1970s.[25] It is still used today for the treatment of BPH-related lower **urinary tract** symptoms.[26]

Published studies show that *Pygeum* bark extracts help control bladder overactivity and reduce prostate enlargement and **nocturia**.[25,27,28] One clinical trial found as much as a **32%** reduction in the frequency of urination at night.[4]

WHAT YOU NEED TO KNOW

Banish the Nighttime Need to Urinate

- Older men routinely suffer from an array of **lower urinary tract symptoms** (**LUTS**). One of the most common is **nocturia**, the need to get up at night to urinate, often more than once.
- Nocturia is more than an inconvenience. It can cause sleep loss, and puts older men at increased risk for falls and fractures. It is also associated with heart disease, physical and mental decline, greater mortality, and more.
- In a clinical trial conducted by **Life Extension®**, over **60%** of the participants using the combination of **beta-sitosterol**, **pygeum bark extract**, **lycopene**, **boron**, and **melatonin** reported relief from nighttime urination symptoms.

Lycopene Helps Prevent Prostate Enlargement

Lycopene is a carotenoid pigment found in tomatoes and some other red or pink fruits and vegetables. It's a well-known **anti-inflammatory** and reduces **oxidative stress**.[29]

Lycopene tends to naturally concentrate in the **prostate gland**, allowing it to deliver its anti-inflammatory effects where they can best help reduce nighttime urination.[30]

Lycopene also has **antiproliferative** properties, which help prevent the abnormal growth of cells and may inhibit prostate enlargement. In cell studies, lycopene was shown to *slow down* prostate cell division.[31]

Like beta-sitosterol, **lycopene** reduces the production of the hormone **dihydrotestosterone**, one of the key drivers of prostate enlargement.[32-34]

In a clinical trial on prostate cancer patients, lycopene-rich tomato products significantly *decreased* **PSA (prostate-specific antigen) levels**, which rise as a man's prostate enlarges (or develops malignant cells).[6]

Boron Helps Protect the Urinary Tract

The mineral **boron** *reduces* several markers of inflammation, including **TNF-α (tumor necrosis factor-alpha)**, **IL-6 (interleukin 6)**, and **C-reactive protein**.[35]

Boron also modulates sex-hormone production and reduces the impact of growth factors, such as **IGF-1 (insulin-like growth factor 1)**, which may contribute to prostate enlargement and nocturia.[35,36]

Boron has additional protective effects in the **prostate**, specifically blocking growth factors necessary for tumor development.[36] In studies, human prostate tumors implanted in mice were smaller by **38%** after low-dose boron supplementation, while serum PSA levels fell **89%**.[36]

Men with the *highest* dietary boron intake have a ***54% associated lower risk of prostate cancer*** compared to those with the lowest intake.[5]

Melatonin Helps Reduce Nighttime Waking

Melatonin, a hormone produced by the pineal gland, has been shown to have potent **anti-inflammatory** effects[37] and may also reduce oxidative stress and blood pressure.[38-40]

Melatonin is best known for regulating **sleep-wake cycles**, and oral melatonin helps induce better sleep in some people.[41-43] While a need to urinate can cause men to wake, men occasionally get up to urinate simply because they find their sleep already disrupted.[44]

A randomized, controlled trial published in the *Journal of Urology* evaluated melatonin's use in men suffering from **severe nocturia**, who wake on average *three times* a night to urinate. In these men, **2 mg** of melatonin before bed reduced the frequency of nocturia.[7]

Another human study found that men receiving **2 mg** of melatonin reduced their frequency of nighttime urination from an average of **3.4** times per night to **2.6** times per night.[8]

Human Trial

A team of **Life Extension**® researchers conducted a 60-day pilot **human trial** to investigate whether these five compounds would work *together* to provide relief from nighttime urinary problems.[9]

The results of this study were published in **2020** in the journal *Global Advances in Health and Medicine*.

Researchers gave a blend of the compounds every night just before bedtime to 30 healthy men, aged 45 to 75 years, with mild **nocturia**.[9]

The formula contained:

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

Before treatment, **87%** of men reported *some degree* of nocturia. After 60 days of treatment, only **23%** still reported *some degree* of nocturia—a **64% reduction**.

Of the men who continued to report some nocturia after treatment, none reported more than a *single* awakening per night.

There was also a notable reduction in the **most severe** cases of nocturia.[9]

Before treatment, **37%** of the men woke *two to three times* nightly to urinate. After treatment, none of the men woke more than once a night.

This means that *all* of the men who had suffered the most **extreme nocturia**—and were at the greatest risk for sleep disruption, falls, and overall mortality[2,14-17]—experienced a reduction in symptoms.

This represents a potential advance for the **40 million** American men currently afflicted with this frustrating and potentially dangerous disorder.

Summary

Many men suffer from **nocturia**, the need to get up one or more times nightly to urinate.

It can cause significant sleep loss and is linked to heart disease, obesity, diabetes, depression, cognitive dysfunction, and increased mortality.

Scientists have identified five compounds with demonstrated benefits for the male **lower urinary tract**:

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

A clinical study showed that most men who took a blend of these compounds experienced an improvement in lower urinary tract symptoms and reduced frequency of nighttime urination. •

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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Fish Oil and Metabolic Syndrome

BY MARSHA MCCULLOCH, RD

Metabolic syndrome refers to a cluster of disorders including abdominal obesity, high blood pressure, low HDL cholesterol, high triglycerides and high blood sugar.[1]

In the United States, nearly ***half*** of people **age 60** and older have this cluster of metabolic disorders.[2]

Individuals with metabolic syndrome are at a higher risk of developing **type II diabetes** and **cardiovascular disease**.[3]

Metabolic syndrome also increases the risk of dementia, non-alcoholic fatty liver, and eye diseases like cataracts.[4-7]

Research shows that **fish oil** rich in omega-3 fatty acids (**EPA** and **DHA**) can help address the causes of **metabolic syndrome**.[8,9]

Americans' average dietary intake of **EPA** and **DHA** is low.[10-12]

Most ***Life Extension***® readers supplement with about **2,000 mg** of **EPA** + **DHA** each day from highly purified **fish oil**.

The Meaning of Metabolic Syndrome

Metabolic syndrome is defined as having at *least* **three** of the following five metabolic disorders:[3]

- Abdominal obesity (a waist circumference *more* than **40 inches** in men or **35 inches** in women),
- High fasting blood glucose (**100 mg/dL** or above),
- High triglycerides (**150 mg/dL** or above),
- Low HDL ("good") cholesterol (**40 mg/dL** or below in men or **50 mg/dL** or below in women), and
- High blood pressure (**130/85 mm Hg** or higher).

These metabolic abnormalities are closely linked with the underlying causes of **insulin resistance** and chronic, low-grade **inflammation**.[7]

Fish oil can help correct multiple elements of **metabolic syndrome**.

Combating Metabolic Syndrome

Though a healthy diet, weight control, and regular exercise are vital for reducing the risk of metabolic syndrome, **fish oil** can also play a role.[13]

Fish oil contains a blend of fatty acids.[11]

The **omega-3** polyunsaturated fatty acids **EPA** (eicosapentaenoic acid) and **DHA** (docosahexaenoic acid) are the main components of fish oil.

Fish oil not only helps *prevent* metabolic syndrome—it can help ***reverse*** it.

When 39 overweight adults followed a healthy lifestyle program for five months, *only* the group that also took **fish oil** daily (providing **540 mg EPA** and **360 mg DHA**) had significantly reduced markers of **metabolic syndrome**.[14]

Fish oil helps prevent and reverse metabolic syndrome by addressing the individual components of the condition.

Fighting Obesity and Inflammation

Fish oil can aid in reducing **obesity** in several ways.

One human trial showed that daily intake of **700 mg-1,620 mg** of **DHA** decreased body fat, including **belly fat**, in people with diabetes. A lower daily intake of DHA (**380 mg-500 mg**) wasn't as helpful.[15]

In this randomized, controlled trial, 68 people with type II diabetes took DHA-rich fish oil or a placebo for two months.[15]

The fish oil group *lost* **0.5-1 inch** from their waistline while the placebo group *gained* **0.5 inch**.[15]

Fish oil also decreases the **inflammation** associated with obesity.

Excess body fat increases the production of **inflammatory cytokines**, including interleukin 1 beta (IL-1 beta), interleukin 6 (IL-6), and tumor necrosis factor-alpha (TNF-alpha).[8]

EPA and DHA provide building blocks for **specialized pro-resolving mediators**, including resolvins, protectins, and maresins. These omega-3 metabolites play a vital role in *turning off* inflammatory responses and promoting tissue repair.[16-19]

Targeting Insulin Resistance

Insulin resistance is closely associated with metabolic syndrome.

Recently, researchers reviewed the effects of fish oil on **diabetes** in a meta-analysis of 30 human trials.[20]

Twenty of the studies (**67%**) showed at least one diabetes-related benefit from fish oil. This included significant decreases in **fasting blood glucose** and **insulin resistance**, compared to placebo.

In a pilot study, researchers gave 32 overweight adults with type II diabetes fish oil (**1,440 mg EPA + 960 mg DHA**) daily for two months.[8]

The subjects experienced a significant *decrease* in **insulin resistance**, compared to the start of the study. In addition, study participants showed reductions in **pro-inflammatory cytokines**.

Similarly, when 36 obese adults took fish oil (**120 mg EPA + 860 mg DHA**) daily for three months, their **fasting insulin** level and **insulin resistance** each dropped by about **13%**. The placebo group had no improvement.[21]

WHAT YOU NEED TO KNOW

A Metabolic Syndrome Solution from the Sea

- **Metabolic syndrome** is a cluster of conditions including abdominal obesity, elevated fasting blood glucose, lipid abnormalities, and high blood pressure. Having metabolic syndrome increases risk for **type II diabetes** and **cardiovascular disease**.
- **EPA** and **DHA**, the main omega-3 fatty acids in **fish oil**, can significantly *decrease* the risk of metabolic syndrome and even help *reverse* the condition.
- One of the best-studied benefits of fish oil is lower **triglycerides**, which can reduce risk of heart disease.
- In **2019**, the **FDA** affirmed a new, qualified health claim for fish oil, noting that consumption of the omega-3 fatty acids EPA and DHA may *reduce* the risk of **high blood pressure** and **coronary heart disease**.
- Americans generally consume only a fraction of the omega-3s needed to reduce these risks. Daily oral intake of concentrated fish oil containing at least **2,000 mg** EPA + DHA can fill this gap.

Omega-3 Reduces Cardiovascular Disease

One of the most widely recognized benefits of fish oil is lower **triglycerides**. This decreases risk of **cardiovascular disease**.[22]

A recent meta-analysis of 40 clinical trials showed that **omega-3** supplementation is associated with significant reductions in the risk for cardiovascular disease death.[23] Specifically, this study found that **EPA+DHA** supplementation is associated with a **reduced risk** of:

- Fatal myocardial infarction (**35%**)
- Myocardial infarction (**13%**)
- Coronary heart disease events (**10%**)
- Coronary heart disease mortality (**9%**)

The study, published in the ***Mayo Clinic Proceedings***, concluded that supplementation with **EPA *and* DHA** reduced the risk of coronary heart disease, including heart attack.[23]

Fish oil containing both EPA and DHA fatty acids has been shown to reduce the risk of cardiovascular disease by *lowering* **triglyceride** levels and *improving* **insulin sensitivity**.[9,24,25]

The cardiovascular protection was greater with *increases* in **omega-3 dosage**. Increasing intake of EPA and DHA by **1,000 mg** per day was associated with a ***reduction*** of **5.8%** in the risk of cardiovascular events.[23]

Life Extension® readers have been advised for decades to supplement with at least **2,000 mg** and higher of combined EPA and DHA to maximize health benefits plus ingest foods rich in omega-3s.

Protecting the Heart

In **2019**, the FDA affirmed a new qualified health claim for fish oil, noting that consumption of the omega-3 fatty acids **EPA** and **DHA** may reduce the risk of **high blood pressure** and **coronary heart disease**.[26]

When blood pressure is elevated, the risks of **heart attack**, **stroke**, and **heart failure** sharply increase.[27]

Metabolic syndrome and insulin resistance compound the problem of high blood pressure in several ways:

- **High blood pressure** interacts synergistically with high blood glucose and harmful lipid levels, worsening atherosclerosis.[27]
- **Insulin resistance** limits the ability of blood vessels to dilate (widen) to promote healthy blood flow.[28,29]
- Higher circulating levels of unhealthy fatty acids due to insulin resistance leads to **blood vessel constriction** and an increase in blood pressure.[13]

Animal and human studies suggest that omega-3s may *inhibit* atherosclerosis and help lower blood pressure in several ways.[30]

Fish oil has **antioxidant**, **anti-inflammatory**, and **anti-clotting** actions in blood vessels. It also promotes blood vessel dilation.[30,31]

Maximizing the Benefits of Fish Oil

Dosage is key for optimizing the benefits of fish oil.

An easy way to determine if omega-3 blood levels are optimal is to take a simple finger-stick test, done at home, called the **Omega-3 Index**.

The test reflects dietary intake of omega-3s.[21] An omega-3 index **above 8%** suggests a lower risk of cardiovascular disease.[32]

Summary

Omega-3 fatty acids found in **fish oil** can improve several components of **metabolic syndrome**, as well as the underlying causes of **insulin resistance** and **chronic inflammation**.

EPA and **DHA** are the main active ingredients responsible for the benefits of fish oil and are available in concentrated form.

Consuming at least **2,000 mg** daily of **EPA + DHA** is usually needed to achieve the metabolic benefits of fish oil, including maintaining healthy triglycerides and blood pressure levels.

Preventing or reversing metabolic syndrome can reduce the risk of type II diabetes, cardiovascular disease, and other serious health conditions. •

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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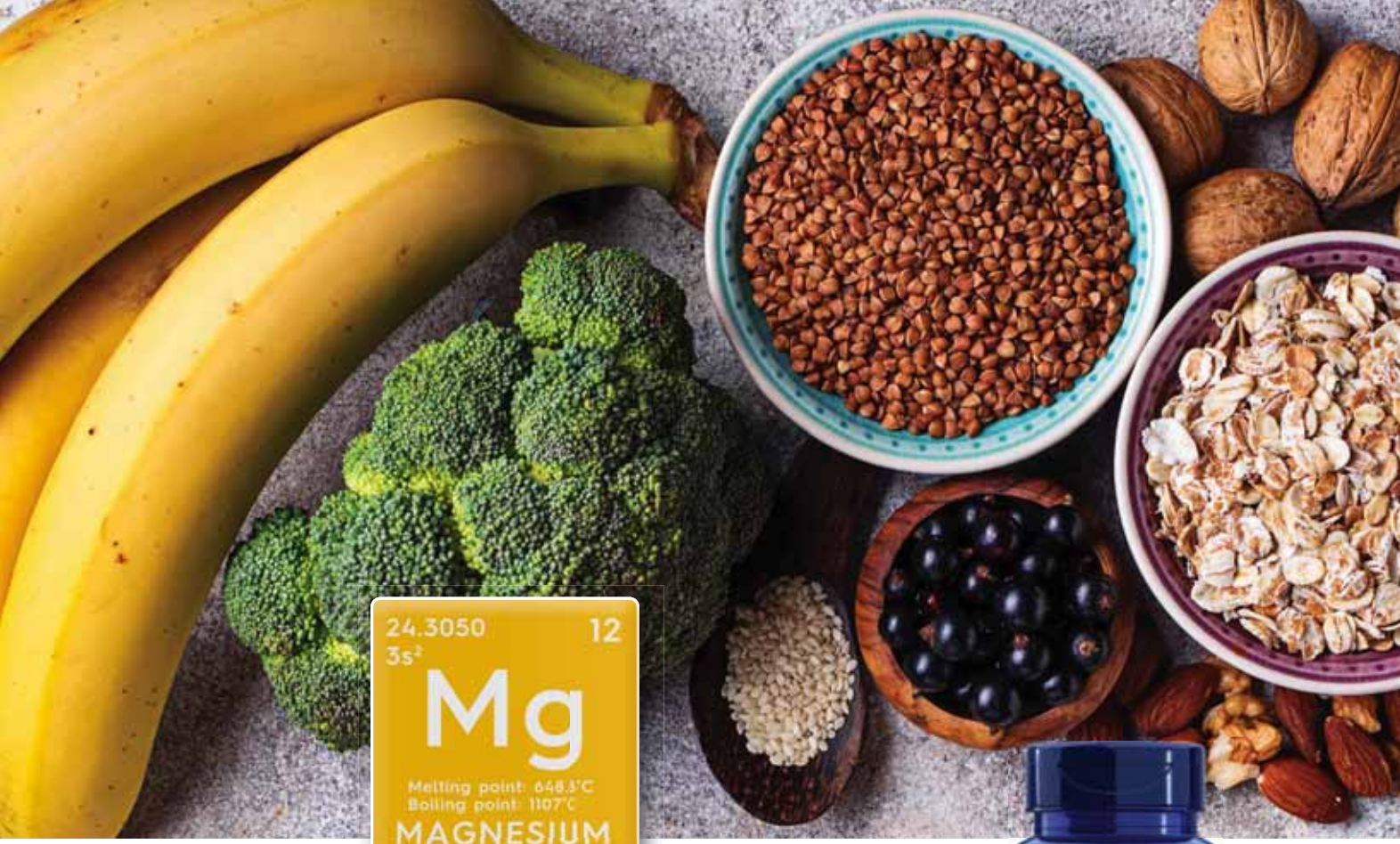

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When You Need It

Unique delivery system provides immediate and extended-release magnesium for full-body coverage of this essential mineral.

CAUTION: If taken in high doses, magnesium may have a laxative effect. If this occurs, divide dosing, reduce intake, or discontinue product.

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GLUTEN FREE

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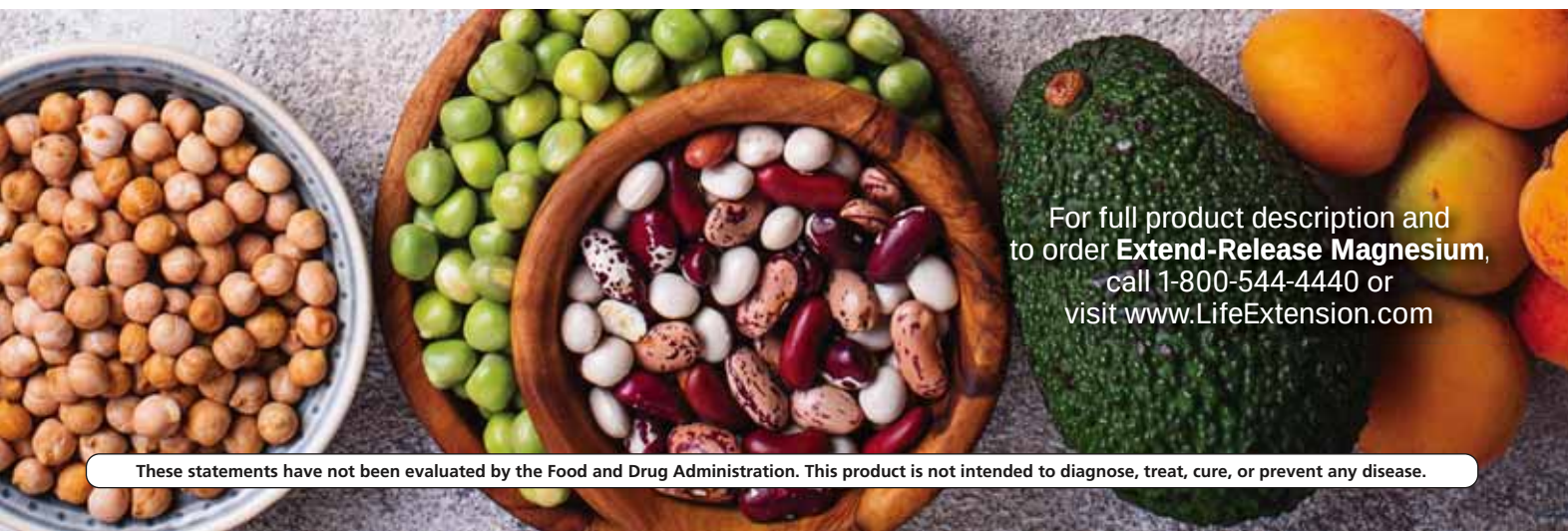
Item #02107 • 60 vegetarian capsules

1 bottle **$9.75** • 4 bottles $8.75 each



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

SAMe

FOR HEALTHY METHYLATION

Life Extension® first introduced **SAMe** in 1997. Since then, researchers around the world have continued to discover its impressive benefits.

While SAMe is largely known for mood support, it has also shown benefits for the liver and joints.

A study by Harvard Medical School and Massachusetts General Hospital cited the impressive benefits of SAMe for mood elevation.[1]

A report published in Germany showed that SAMe may help maintain healthy neurological function. This impressive report found that SAMe:[2]

- Increased **glutathione** levels by **50%** and glutathione enzyme activity by **115%**,
- Decreased a measurement of **free radical** activity by **46%**, and
- Inhibited **lipid peroxidation** by **55%** in culture.

In addition to these findings, SAMe also improves brain cell **methylation**, thereby facilitating youthful **DNA enzymatic actions**.

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

Item #02176

400 mg, 30 enteric coated vegetarian tablets

1 box **$27** • 4 boxes $24 each

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(SAMe is also available in boxes containing 30 200 mg tablets. Price is $18.75. If you buy four, the price is reduced to $16.50 per box. Item #02175).

CAUTION: SAMe should not be taken by those diagnosed with bipolar disorder.

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* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years.
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Blood Tests to Better Predict Cardiovascular Risk

BY MICHAEL DOWNEY

Blood tests routinely ordered by mainstream doctors do not provide information needed to fully assess **cardiovascular risk**.

More detailed tests can pinpoint cardiac risks—and perhaps save your life.

This article describes **blood tests** to evaluate vascular health status before one develops symptoms of a **heart attack** or ischemic **stroke**.

Doctors Fail to Test Critical Factors

Most **cardiovascular disease** is hidden until chest pain (angina) or a stroke manifest.

Standard **blood tests** for total **cholesterol**, low-density lipoprotein (**LDL**), and high-density lipoprotein (**HDL**) provide a partial picture of cardiovascular risk.

Missing from most cardiac tests is the number of **small LDL particles** circulating in your blood.

Small LDL cholesterol can be serious because the smaller particle size enables it to penetrate the arterial wall and start the process of **plaque formation**.

Small LDL is also more susceptible to oxidative damage.[1]

Knowing your **LDL particle count** provides crucial information beyond total cholesterol and LDL.

A blood test called the **NMR LipoProfile®** provides this information using nuclear magnetic resonance (NMR) spectroscopy to directly measure particle **size** *and* particle **count**.

NMR LipoProfile®

The **NMR LipoProfile®** blood test measures:

- **LDL-P**—this is the **count** of LDL particles, and
- **Small LDL**—this is the **count** of *small* LDL particles.

If either of these is high, it is an indicator of an elevated risk of an **atherosclerotic** disease.

The **NMR LipoProfile®** determines the **size** of the **LDL** particles in your blood. Larger and more buoyant LDL particles do not pose the same risk as **small LDL**.

The **NMR LipoProfile®** test also provides a measure of **HDL-P**. This is the particle **count** for HDL, the "good" cholesterol. You want this number to be high.

Another test included in this panel is the **LP-IR** score, which you want to be low. This is a marker for **insulin resistance**—the *higher* the number, the greater the probability of developing diabetic-related disorders.

Knowing this may allow you to take corrective action before **type II diabetes** manifests and with it, the much greater risk of cardiovascular disease.

Some researchers have found that insulin resistance is associated with an increased risk for **cancer**.[2,3]

But how can you confidently interpret your numbers?

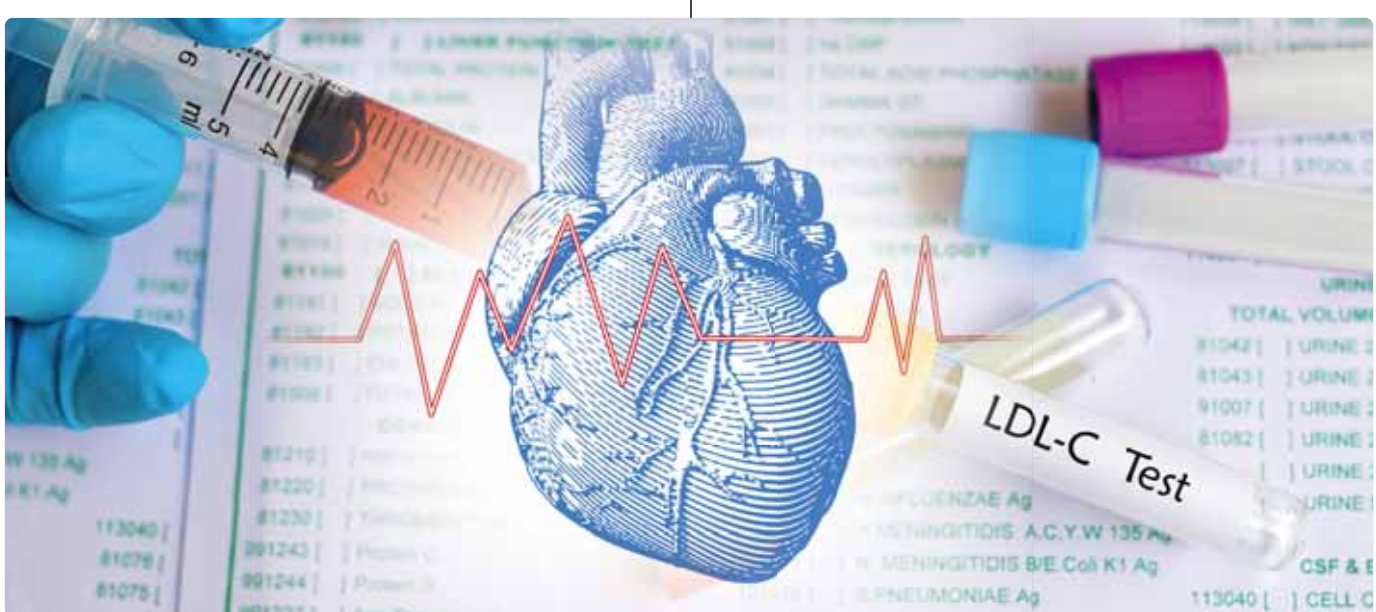
Included with the results of the **NMR LipoProfile®** test is a **chart** that helps identify your particular risks for coronary heart disease.

Results from an **NMR LipoProfile®** blood test arm you with a more comprehensive picture that you can discuss with your doctor.

Oxidized LDL Test

Oxidized LDL cholesterol is more dangerous than non-oxidized cholesterol. **Small cholesterol** particles are notorious for oxidizing faster.

Oxidized LDL particles penetrate arterial walls (endothelium) and start a cascade of inflammatory events that lead to the formation and buildup of foam cells



and plaque. (Foam cells are immune cells engorged with fatty LDL.)

These structural changes account, in part, for atherosclerotic disease and risk of heart attack, stroke, and other cardiovascular disease.[4]

There are tests available that measure **oxidized LDL** and its related markers of **inflammation** to provide a better idea of what is happening inside your arteries.

Assessing Vascular Inflammation

The **MPO blood test** is important for individuals who have a family history of cardiovascular disease or who make poor lifestyle choices.

When white blood cells attack the arterial wall, they release an enzyme called ***myeloperoxidase*** or **MPO**.

This process is dangerous when it occurs in response to **oxidized LDL** cholesterol. It creates **foam cells** that contribute to atherosclerotic plaque and narrowing of arteries.

MPO amplifies **inflammation** and causes problems that increase **arterial plaque**. Often, the plaque that MPO boosts is of the worst type—soft, vulnerable plaque that is prone to rupture.[5,6]

Making matters worse, MPO itself can also oxidize LDL cholesterol, further promoting plaque.[7] It can even oxidize HDL cholesterol—the "good" type of cholesterol—which renders HDL dysfunctional.

C-Reactive Protein (CRP)

High sensitivity **C-reactive protein** (CRP) detects changes in inflammatory levels throughout the body.

CRP rises quickly after an inflammatory attack but should soon return to normal levels. When CRP remains high, however, it is an indication of **chronic inflammation**.

Elevated CRP levels indicate risk of heart attack, stroke, and death from cardiovascular disease – *even in apparently healthy people*.[8]

A study of over 50,000 individuals found that the *higher* the **CRP** levels, the greater the risk of cardiovascular disease and heart attack.[9]

And in addition to being a marker, CRP itself may ***contribute*** directly to cardiovascular and diabetes risk.[8,10] Elevated CRP levels have also been linked to **cancer** risk.[11,12]

WHAT YOU NEED TO KNOW

Blood Tests for Cardiovascular Health

- More detailed, more informative blood tests can pinpoint cardiac risk much better than the standard tests routinely ordered.
- Standard lipid tests give an incomplete picture, missing key cardiovascular disease markers.
- Stroke and heart disease remain the leading causes of disability and death. Most are preventable when risk factors, including hypertension are controlled.

Apolipoprotein B

Apolipoprotein B (ApoB) is a primary protein constituent of all non-HDL cholesterol particles.

When apolipoprotein-B-containing particles penetrate the inner arterial wall (*endothelium*), they spark the initiation and progression of **atherosclerosis**, setting the stage for eventual blockage of blood flow.[13-15]

Apolipoprotein B proteins are now "***widely accepted as the most important causal agents of atherosclerotic cardiovascular disease***."[13]

A study found that even when total cholesterol and HDL are within *healthy* ranges, high levels of **apolipoprotein B** can increase coronary heart disease risk by about **60%**.

When **total cholesterol** and **HDL** are in *unhealthy* ranges, high levels of **apolipoprotein B** can boost coronary heart disease risk by a frightening **160%**.[16]

A review of 27 studies found that lowering apolipoprotein levels resulted in a **reduction** in ***existing*** arterial plaque.[17]

The **apolipoprotein B** blood test is an often-overlooked indicator of cardiovascular risk.

Other Heart-Disease-Related Blood Tests

Several other **blood tests** can help round out an evaluation of your risk for **cardiovascular disease**.

Homocysteine

Elevated levels of homocysteine may directly damage the delicate cells that line the inside of your arteries (*endothelium*), resulting in vascular inflammation, blood clot formation, and greater risk of stroke.

Vitamin D 25-Hydroxy

Low levels have now been found to be associated with increased risk for cardiovascular disease.[18,19]

More than **70%** of Americans have either deficient or insufficient blood levels of vitamin D.[20]

Life Extension® supporters have long been advised of the importance of maintaining an optimal vitamin D level between **50-80 ng/mL**.

CBC/Chemistry Profile

This test includes a complete blood count (CBC) to indicate general and immune health. It also tests platelets for clotting status, as well as hemoglobin for oxygen-carrying capacity. The chemistry panel measures glucose, electrolytes, important liver enzymes, kidney markers, calcium, and uric acid levels.

HbA1c

High blood levels of glucose are a major cause of long-term health issues, from cancer to **heart disease**. Practically all tissues in the body are negatively impacted by high blood sugar.

A **hemoglobin A1c** test is a superior way to screen for glucose problems because it shows what levels have looked like over the past *two to three months*. The higher the level, the more severe the problem with blood glucose control.

In addition, studies have shown that high levels of hemoglobin A1c are an important predictor of risk for heart disease, even in individuals who do not have metabolic syndrome or diabetes.[21]

Omega-3 Index

In **June 2019**, the FDA affirmed a new, **qualified health claim** for fish oil, noting that consumption of the omega-3 fatty acids **EPA** and **DHA** may reduce the risk of high blood pressure and coronary heart disease.[22]

A simple, finger-stick test provides a wealth of information about **omega-3** and **omega-6** fatty acids' status in your blood.

One study found that those with an **omega-3 index** of **8%** or greater, compared to those with levels below **4%**, were estimated to have about a **30% lower risk of death** from coronary heart disease.[23]

Interpreting Your Results

The Wellness Specialists at **Life Extension®** are available seven days a week to help you understand your blood test results at no charge. But as a quick rule, the very best results would be:

- *Low* LDL-P (low LDL particle count),
- *Low* small LDL-P (low small LDL particle count),
- *Large* LDL size (large and buoyant is the best kind of LDL),
- *Low* LP-IR (lower means better insulin sensitivity),
- *Low* oxidized LDL (oxidized LDL is more atherogenic),
- *Low* MPO (lower MPO indicates reduced vascular inflammation),
- *Low* HbA1c (high levels indicate elevated blood sugar and greater prediabetes or type II diabetes risk), and
- Omega Index **8%-11%** (some data indicate **8%** and above is ideal).

Results from these laboratory tests provide "reference ranges" that are helpful, but **Life Extension®** often recommends improvements beyond conventional guidelines to lower risk of cardiovascular diseases.

Summary

Mainstream doctors seldom order a complete panel of technologically advanced blood tests to assess risk of cardiovascular disease events.

Levels of total cholesterol, LDL, and HDL do not paint the full picture of heart disease and stroke risk. While important, they are the tip of the iceberg of potentially important information.

Advanced, more detailed blood tests can better pinpoint risk of atherosclerosis, heart attack, and stroke. •

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

What Cardiovascular-Risk Tests Do You Need?

The popular **Male** or **Female Panel Blood Panel** provides many tests described in this article including:

Apolipoprotein B (ApoB)	**Homocysteine**
Hemoglobin A1c	**LDL cholesterol**
Total cholesterol	**HDL cholesterol**
Triglycerides	**25-hydroxyvitamin D**
C-reactive protein (high sensitivity)	**Complete Blood Count (CBC)/Chemistry**

As you can see on page 15 of this month's issue, the **Male** or **Female Panels** provide far more tests than are typically prescribed in medical settings.

Those at higher risk for **coronary artery occlusion** or ischemic **stroke** should consider having the **NMR LipoProfile®** at least one time. If results come back in safe ranges, then this test may not be needed again for many years.

When first introduced, tests that measured **small LDL particles** and other lipid fractions in the **NMR LipoProfile®** cost **over $300**. During the annual lab sale, you can obtain the **NMNR LipoProfile®** for only **$74.25**.

Similarly, once optimal balance of omega-3s to omega-6s and higher omega-3 index is established, the **Omega-3 Index** may only need to be done in response to outward changes indicative of **inflammation** or significant dietary alterations.

Those with prexisting atherosclerosis, or who are otherwise at high risk of cardiovascular events may consider adding **oxidized LDL** and/or **myeloperoxidase (MPO)**.

Note the **Blood Test Super Sale Price** for the **Male** or **Female Panel** is **$224**, which is up to **90%** lower than what large commercial labs charge for these same tests.

A Low-Cost, Easy Way to Have Blood Tests Done

The high cost of conventional blood testing discourages many people from availing themselves of this life-saving diagnostic, including today's more detailed, more useful tests.

Life Extension® long ago resolved this by allowing readers to order low-cost blood tests directly and then visit a drawing station in their own area at their convenience.

Detailed results typically come back in less than a week and are emailed to you. If you have any questions, our Wellness Specialists are available to assist, seven days a week at no charge.

Once a year, we discount prices of all lab tests. This is a convenient reminder to have your annual tests performed and save up to **25%** in the process.

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◯ **FEMALE PANEL— NOW WITH FERRITIN (LC322535)** **CBC/Chemistry/Lipids Panel** • DHEA-S • Estradiol • Homocysteine • ApoB • C-Reactive Protein (high sensitivity) • Progesterone • Free Testosterone • Total Testosterone • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c • Insulin • Magnesium	$224
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◯ **OXIDIZED LDL (LC123023)** Oxidized low-density lipoprotein (LDL) cholesterol is one of the main causes of the formation of atherosclerotic plaque in the arterial wall. This blood test measures levels of oxidized LDL.	$56.25
◯ **MYELOPEROXIDASE (MPO)* (LC123006)** The myeloperoxidase (MPO) test measures levels of an enzyme that oxidizes low-density lipoprotein (LDL) cholesterol, which could lead to increased arterial plaque formation.	$74.25
◯ **ADVANCED OXIDIZED LDL PANEL* (LC100035)** This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase, and Oxidized LDL.	$198.75
◯ **OMEGA-3 INDEX COMPLETE** (LC100066)** Beneficial for everyone! People not taking omega-3/fish oil should check their baseline Omega-3 Index to see if it is in the desirable or concerning range. Those taking Omega-3/fish oil supplements should take the test to see if they need to adjust their dosage. You want to target a range of **8%-12%** for your Omega-3 Index score.	$74.25
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◯ **PERSONALIZED AMINO ACID HEALTH ASSESSMENT** (LC100090)** An in-depth analysis of amino acid metabolism provides insight into various health concerns, such as maldigestion, GI dysbiosis, neurological issues and more, with a personalized report of diet and supplementation suggestions. Provided as an at-home urine collection kit.	$224.25
◯ **COMPREHENSIVE VAGINOSIS PROFILE**† (LC100091)** This test uses a simple, self-collection swab to measure both healthy and unhealthy vaginal microflora to determine if there's a problem. Susceptibility testing is performed on problematic microorganisms to determine effective remedies.	$111.75

ANNUAL LAB TEST PANELS

LAB TEST SALE PRICE

GI 360 PROFILE™ **† (LC100088) — $379.25
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This test measures delayed (IgG) food allergies for 95 common foods.

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This test measures delayed (IgG) food allergies to an additional 95 foods.

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CBC/Chemistry/Lipids Panel • Free and Total Testosterone • Estradiol • Total Estrogens • DHEA-S • Progesterone • Pregnenolone • TSH • DHT • FSH • LH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Free and Total PSA • Vitamin D 25-OH • hs-CRP, ferritin • Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium

MALE COMPREHENSIVE HORMONE PANEL* (LC100010) — $224.25
CBC/Chemistry/Lipids Panel • DHEA-S • Estradiol • DHT • PSA • TSH • Pregnenolone • Total and Free Testosterone • SHBG • Free T3

MALE BASIC HORMONE PANEL (LC100012) — $56.25
DHEA-S • Estradiol • Total and Free Testosterone • PSA

LAB TEST SALE PRICE

FEMALE ELITE PANEL* (LC100017) — $431.25
CBC/Chemistry/Lipids Panel • Free and total Testosterone • Estradiol • Total Lipids • Estrone • DHEA-S • Progesterone • Pregnenolone • DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium

FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011) — $224.25
CBC/Chemistry/Lipids Panel • DHEA-S • Estradiol • Total Estrogens • TSH • Free T3 • Progesterone • Pregnenolone • Total and Free Testosterone • SHBG

FEMALE BASIC HORMONE PANEL (LC100013) — $56.25
DHEA-S • Estradiol • Total and Free Testosterone • Progesterone

WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) — $206.25
CBC/Chemistry/Lipids Panel • DHEA-S • Free and Total Testosterone • Estradiol • Progesterone • Cortisol • TSH • Free T3 • Free T4 • Reverse T3 • Insulin • Hemoglobin A1c • Vitamin D 25-hydroxy • C-reactive protein (high sensitivity) • Ferritin

HEALTHY AGING PANEL-COMPREHENSIVE* (LC100026) — $186.75
CBC/Chemistry/Lipids Panel • C-reactive protein (high sensitivity) • Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c • TSH • Free T3 • Free T4 • Ferritin • Urinalysis • ApoB • Insulin

CBC/CHEMISTRY/LIPIDS PANEL

These **CBC/Chemistry/Lipids Panel** tests are included in the popular **Male** and **Female Panels**, and other panels on this page so you don't have to order them separately.

CARDIOVASCULAR RISK
Total Cholesterol • HDL Cholesterol • LDL Cholesterol Triglycerides Cholesterol/HDL Ratio • Estimated CHD Risk • Glucose

LIVER FUNCTION
AST (SGOT) • ALT (SGPT) • LDH • Total Bilirubin • Alkaline phosphatase

KIDNEY FUNCTION
BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid

BLOOD PROTEINS
Total Protein • Albumin • Globulin • Albumin/Globulin Ratio

BLOOD COUNTS
Red Blood Cell Count • White Blood Cell Count • Eosinophils Neutrophils (Absolute) • Lymphs (Absolute) • Eos (Absolute) Baso (Absolute) • RDW • Monocytes (Absolute) • Monocytes Lymphocytes • Platelet Count • Hemoglobin • Hematocrit MCV • MCH • MCHC • Neutrophils

BLOOD MINERALS
Calcium • Potassium • Sodium • Chloride • Iron

The price for the **CBC/Chemistry/Lipids Panel** alone is **$35.**
(LC381822) Sale price is $26.25

This is NOT a complete listing of LE lab 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. Customer is responsible for obtaining dry ice.
** This test is packaged as a kit.
† Not available in NY.

Lab tests available in the continental United States and Anchorage, AK only. Restrictions apply in NY, NJ, RI, and MA. Not available in MD. Kits not available in PA.

Can You Afford to be Deficient?

(For about 12 cents a day)

BY CHANCELLOR FALOON

Vitamin D impacts our health from immunity to heart health.

Here is an update on some vitamin D studies in recently published articles:

- Supplementing with vitamin D was associated with a lower rate of **rhinovirus infection** (the most common virus causing colds) in asthmatic children compared to children who were not supplemented.[1]
- **Crohn's** disease patients had significantly lower vitamin D blood levels than healthy controls.[2]
- **Tuberculosis** patients were twice as likely to have vitamin D deficiency compared to patients without tuberculosis.[3]
- Vitamin D deficiency is associated with elevated **oxidative stress** across multiple age groups.[4]
- Patients with benign paroxysmal positional **vertigo** who received conventional treatment plus vitamin D and calcium supplementation showed a lower rate in the annual recurrence of vertigo attacks compared to those who received conventional treatment only.[5]
- **Coronary artery bypass** patients supplemented with acute dosing of vitamin D (**150,000 IU** of vitamin D daily for three days) before surgery had significantly lower indicators of **heart** cell death.[6]
- *Higher* vitamin D blood levels were associated with a better response to the **hepatitis B vaccine**. However, vitamin D supplementation starting on the **third day** following vaccination was not associated with a better vaccine response compared to controls.[7]
- A review of the scientific literature concluded that there is convincing evidence that vitamin D supplementation is valuable for the treatment and prevention of **erectile dysfunction**.[8]

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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THINK
More Clearly

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An array of published studies describes how **lactoferrin** up-regulates innate and adaptive **immune** responses to a variety of antigens.

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(Two-Month Supply)

Contains milk.

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VITAMIN D3

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CAUTION: Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

BOOSTS HEART HEALTH

GLUCOSAMINE

BEYOND JOINT HEALTH

Glucosamine has been used for decades to support **joint function** and **protect cartilage**.

New studies reveal it may also promote **heart health** and beneficial **autophagy**.

Large cohort studies showed that people who took **glucosamine** were more likely to live longer, healthier lives.[1-4]

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Glucosamine Sulfate

Item #02420 • 750 mg, 60 capsules

1 bottle **$12** • 4 bottles $10.50 each

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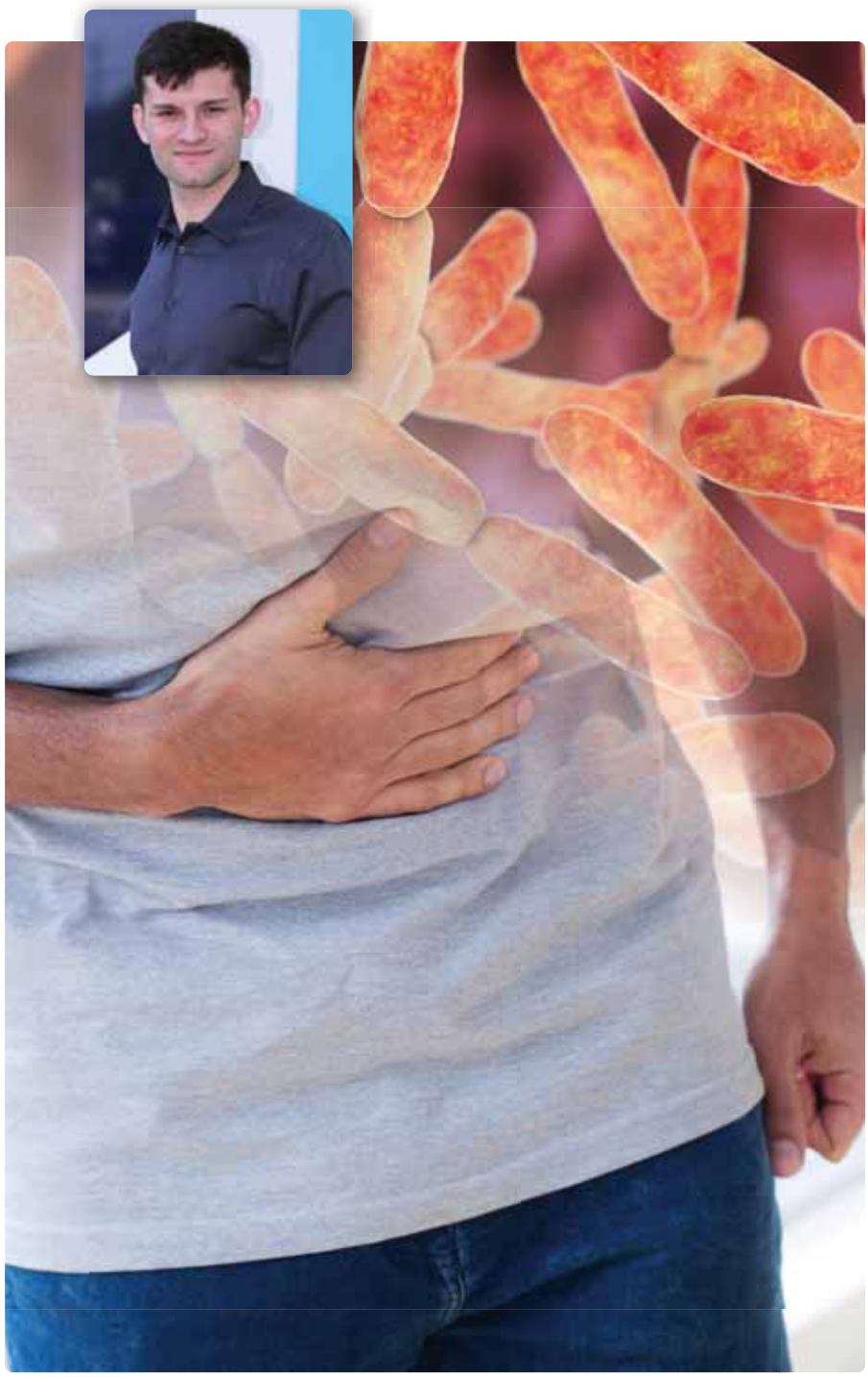
For full product description and to order **Glucosamine Sulfate**, call **1-800-544-4440** or visit **www.LifeExtension.com**

What is Glutamine?

BY CHANCELLOR FALOON



There are 20 amino acids utilized by our genetic code to manufacture proteins. **Glutamine** is the most abundant and versatile.[1]

Research shows that it may improve **digestive** and **gut health** and enhance the body's response to **exercise**.[1,2]

Researchers consider glutamine to be ***semi-essential*** because the body often doesn't produce enough.[3] The difference needs to be made up by oral intake.

Many people take whey or vegan protein, which already contains glutamine. For some individuals, however, this might not be sufficient.

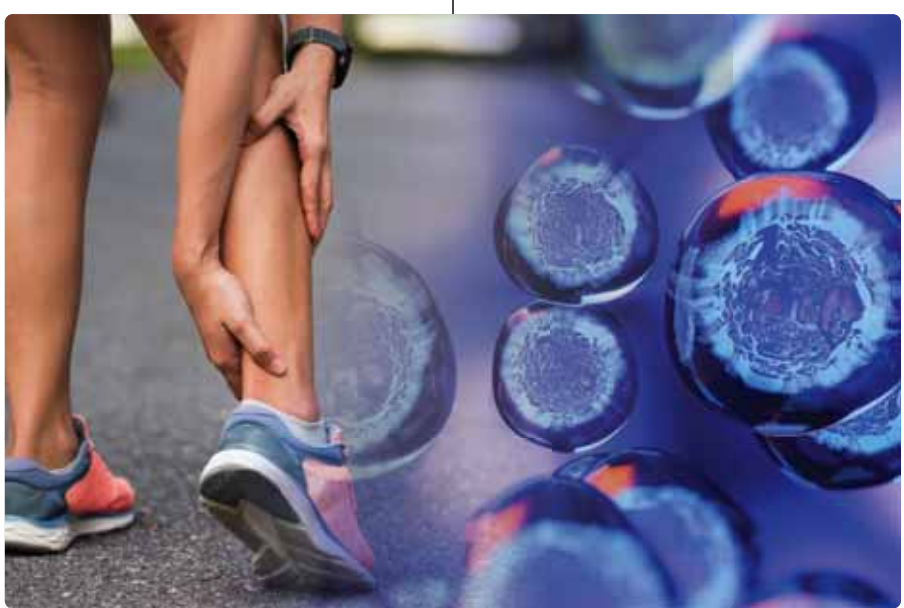
While glutamine is found throughout the body, about **30%** of total glutamine is used just in the **intestines**.[4] Because of this, a depletion of glutamine can be especially consequential to gut health.

Three randomized, controlled studies have shown that glutamine use benefits intestinal health:

- Thirty-three obese or overweight adults received either **glutamine** or the amino acid **L-alanine** for two weeks to analyze changes in gut microbiota.[5] Those who received glutamine had a decreased ratio of *Firmicutes* bacteria to *Bacteroidetes* bacteria. Imbalance of this ratio is considered dysbiosis. Higher ratios are usually seen in obesity and in inflammatory bowel disease (IBD).[6] The ***improved gut microbiota balance*** with the use of glutamine suggests it is a good candidate to help restore gut flora balance.
- Ten active men received glutamine or a placebo before intense exercise, to study **gastrointestinal permeability** differences post-exercise.[7] Increased intestinal permeability, also known as "**leaky gut**," is related to multiple digestive disorders. Those taking glutamine had *decreased* gastrointestinal permeability compared to those in the placebo group.
- In a larger study, 106 participants with **irritable bowel syndrome** took glutamine or a placebo for eight weeks.[8] Irritable bowel syndrome severity scores were *reduced* by **50 points** or more in **79.6%** of the glutamine group but in only **5.8%** of the placebo group.

Additional studies have shown that glutamine may:

- Improve **immune function** in heavy-load-training athletes,[9]
- Reduce the accumulation of **blood ammonia** (believed to be a cause of fatigue) in high-level endurance athletes,[10]
- Decrease **muscle soreness** following eccentric exercise (a workout in which the muscles get longer in response to a force, for instance, the downward phase of a biceps curl),[11]
- Reduce symptoms for **sickle cell anemia** patients,[12] and
- Reduce chemotherapy- and radiation-induced **mucositis** (inflammation of the mucous membrane) in cancer patients.[13]



To summarize, research has shown that **glutamine** can improve **intestinal health** and **exercise response**.

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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- **Vitamin D3 • 25 mcg** (**1,000 IU**): supports muscle strength and performance.

Mix one scoop with approximately **8 oz**. of cold water or other beverage, preferably a protein shake, and drink once daily or as recommended by a health practitioner.

Item #02221 • About 30 servings
94.2 g (3.32 oz) Container
1 container **$27**
4 containers $24 each

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For full product description and to order **Wellness Code® Muscle Strength & Restore Formula**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Uses of CaHMB and Vitamin D are licensed under U.S. Patent Nos. 8,815,280, 9,259,430, 9,539,224 and 9,707,241.

CAUTION: Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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Glutamine is an amino acid used by athletes to support protein synthesis and cellular energy.

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Whey protein, packed with vital amino acids, promotes **glutathione** synthesis.

Glutathione plays an important role in supporting **immune** balance in the body.[1-3]

Whey fractions help modulate a full range of healthy bodily functions.

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

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Contains 80% easy-to-digest protein.
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ADVANCED WHEY ISOLATE with GLUTAMINE and CREATINE

A premium isolate for greater strength and exercise performance. **Item #02246 Vanilla⁺**
1 container $22.50 • 2 containers $19.50 each

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

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Superiority Burger Cookbook

The Vegetarian Hamburger is Now Delicious

BY BROOKS HEADLEY

Superiority Burger is a small restaurant located in the East Village neighborhood of Manhattan, in New York City, that specializes in vegetarian and vegan fare. In the five years since its grand opening, it has become a worldwide sensation, with pop-up restaurants opening in Washington, DC, Los Angeles, and Tokyo.

But you don't have to travel around the world or wait in lines around the block to see what the fanfare is all about.

Brooks Headley, owner of Superiority Burger, recently published the *Superiority Burger Cookbook*. In it, he documents nearly every recipe from the restaurant's main menu and specials board—including the renowned Superiority Burger.

But Headley cautions not to expect this burger to have the taste or texture of one made with meat.

He explained, "This is not fake meat, nor is it vying to be. The un-likeness to the real thing is canny." Instead, he continued, "Think of these as vegetable and grain croquettes that get put on buns."

Like its namesake, *Superiority Burger Cookbook* offers a wide variety of sandwiches, sides, soups, and more.

Here, ***Life Extension***® shares the Superiority Burger recipe itself, along with the special sauce that gives it that extra kick. We've also included two side dishes and a soup that could quickly take this robust burger from lunch fare to a hearty dinner.

—LAURIE MATHENA

Superiority Burger

MAKES 8 TO 10 PATTIES

1 cup red quinoa

1 medium yellow onion, chopped

2 teaspoons ground toasted fennel seeds

1 teaspoon chili powder

1 cup cooked chickpeas, rinsed and drained

1 teaspoon white wine vinegar

1 cup small-diced carrots

½ cup coarse breadcrumbs

¾ cup walnuts, toasted and crushed

Juice of 1 lemon

1 tablespoon chopped fresh flat-leaf parsley

1 tablespoon hot chili sauce

2 tablespoons non-modified `potato starch

Grapeseed oil for searing the patties

Toasted buns/shredded lettuce/ roasted tomatoes/2 pickle slices/ Muenster cheese (if you like)/ sauces of your choice (like Special Sauce, see next page) for serving

Preheat the oven to 425°F.

Cook the quinoa in 1½ cups unsalted water until fluffy, about 45 minutes. Cool and reserve. In a separate pan, sauté the onion until translucent and browned, and season with salt, pepper, the fennel, and chili powder. Add the chickpeas and keep on the heat for 5 to 10 minutes, stirring constantly. Deglaze the hot pan with the white wine vinegar and scrape everything stuck to the bottom of the pan back into the mix. Using a potato masher, roughly smash the onion-chickpea mixture. Mix the chickpea mash by hand with the cooled quinoa.

Roast the carrots in the oven until dark around the edges and soft, about 25 minutes. Add to the chickpea-quinoa mixture. Add the breadcrumbs, walnuts, lemon, parsley, and chili sauce, and season again with salt and pepper, until it tastes sharp. Mix the potato starch with 1 tablespoon water to create a cloudy, thick slurry. Fold the slurry into the burger mix as the binding agent. Form the mixture into 8 to 10 patties and sear in grapeseed oil in a hot sauté pan or cast-iron skillet until fully browned, about 3 minutes on each side.

To serve, place each patty on a toasted bun with shredded iceberg lettuce, roasted red tomatoes, 2 pickle slices, Muenster cheese (if you like), and sauces such as Special Sauce.

Special Sauce

MAKES ABOUT 2 CUPS

1 cup chickpea mayo (see on right)

½ cup roasted red tomatoes

¼ cup ketchup

¼ cup hot chile sauce

1 tablespoon red wine vinegar

Combine all the ingredients in a tall container just large enough to fit the top of an immersion blender. Blend until smooth and the tomatoes are broken up. Season with salt, if necessary, and a little bit of pepper. This can also be done in a food processor.

Chickpea Mayo

MAKES ABOUT 2 CUPS

½ cup liquid from a chickpea can

20 individual chickpeas

1½ tablespoons Dijon mustard

2 tablespoons cider vinegar

1 tablespoon cane sugar

2 teaspoons kosher salt

2½ cups grapeseed oil

Combine the chickpea liquid, chickpeas, mustard, cider vinegar, sugar, and salt in a tall container just large enough to fit the head of an immersion blender. Blend at high speed until the mixture is completely smooth and all the whole chickpeas are broken down.

While the blender is running, slowly drizzle in the grapeseed oil. As you add the oil, an emulsion will form and it will begin to thicken. Check the seasoning for salt and sugar. This will keep, covered, in the refrigerator for about 1 week.

Peas and Pesto

SERVES 6

6 cups packed basil leaves

1 garlic clove

½ cup marcona almonds, toasted and roughly chopped

1 cup extra virgin olive oil

1 pound shell-shaped pasta (we use gnocchi shape)

2 cups green peas, fresh or frozen (if fresh, blanched)

Bring a pot of salted water to a rolling boil. Prepare an ice bath. Blanch the basil leaves for only 5 seconds, until they turn bright green. Using a strainer or a spider, remove the leaves from the water and immediately plunge them into the ice bath. Save the blanching water.

Drain quickly and squeeze dry in a clean kitchen towel. Transfer the basil to a blender and add the garlic clove, almonds, and olive oil and puree until a smooth sauce forms. Transfer to a bowl and season with salt and pepper.

In the pot of boiling water, cook the pasta until just shy of al dente. Immediately strain in a colander and then spread out the pasta on two flat sheet trays to cool as quickly as possible.

Combine the cooked pasta with the pesto and peas in a large bowl. Toss thoroughly so that the pesto really thickly coats all the pasta (inside and out) and the peas begin to find their way into the cavities of the shells. If the sauce is too thick, a squirt of water will make it creamy. Check the seasoning for salt and pepper and serve immediately.

Stuffed Green Peppers with Coconut and Iceberg

SERVES 4

2 tablespoons grapeseed oil

1 pound firm tofu, drained well and roughly crumbled

2 tablespoons golden balsamic vinegar

2 tablespoons extra virgin olive oil, plus more for drizzling

1 medium yellow onion, cut into small dice

2 garlic cloves, minced

3 ears of corn, husked and kernels removed from the cob, or 2 cups creamed corn

One 13-ounce can full-fat coconut milk

4 to 6 green bell peppers

2 cups shredded iceberg lettuce

¼ cup unsweetened coconut flakes, toasted

1 celery stalk, cut into small dice

2 tablespoons seasoned rice wine vinegar

Heat the grapeseed oil in a deep sauté pan over medium-high heat until shimmering. Add the crumbled tofu and cook until golden brown all over, about 8 minutes. Add the golden balsamic vinegar and cook for a little longer to let the sugar in the vinegar caramelize. Scrape the tofu into a bowl and set aside.

Rinse out the sauté pan and return to medium heat. Add the olive oil, onion, and a pinch of salt to the pan and cook, stirring often, until a deep brown color develops.

Add the garlic and cook for a minute more, until aromatic. Deglaze the pan with water if the onions are getting too brown and sticking to the bottom of the pan. Add the corn, coconut milk, and the cooked tofu. Let this simmer for about 15 minutes. Remove the pan from the heat and blend a little using either an immersion blender or a food processor. The mixture should have the consistency of thick chili. Add salt and black pepper as needed.

Preheat the oven to 375°F. Lightly oil an 8-by-8-inch baking dish.

Cut the bell peppers in half lengthwise, deseed using a little paring knife, and remove the stem if you are concerned about accidentally eating it. Stuff the peppers with the tofu mixture using a small spoon—use the back of the spoon to push the mixture into the pepper to fully fill it. Add enough filling to form a mound on top of the pepper.

Pack the peppers as tightly as possible into the baking dish with the stuffed part facing upward. Drizzle a little olive oil on top of the peppers, cover with aluminum foil, and cook, covered, for 25 minutes.

Crank the oven to 425°F and cook for another 15 minutes, until the filling is browned.

Serve these at room temperature or warm. Though the peppers are good on their own, a small salad of iceberg lettuce, toasted coconut, celery, and rice wine vinegar scattered over the top of the peppers right before serving is a nice garnish.

Vegetable Soup with Curly Parsley

SERVES 6

Extra virgin olive oil

3 medium yellow onions, finely chopped

2 carrots, cut into small dice

3 celery stalks, cut into small dice

2 red bell peppers, cut into small dice

4 garlic cloves, minced

2 tablespoons tomato paste

½ cup dry white wine

6 cups water

½ head green cabbage, cut into ¼-inch ribbons

Red wine vinegar (optional)

1 bunch greens (kale or Swiss chard), stems removed, torn into small pieces

Fresh curly parsley

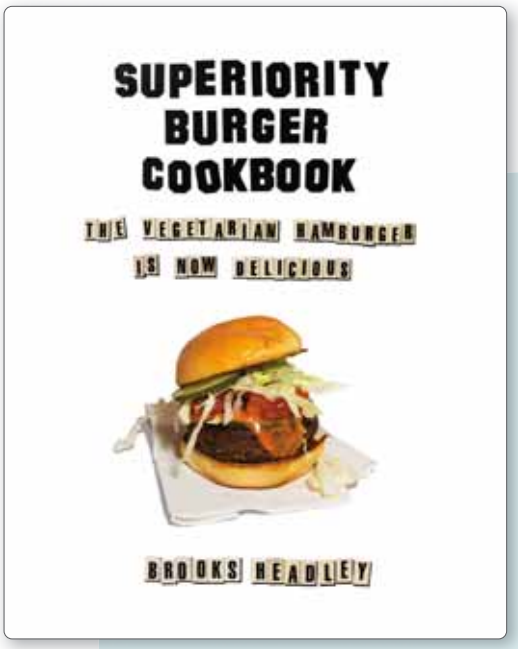
White Italian bread, toasted, drizzled with extra virgin olive oil, rubbed with a garlic clove, and sprinkled with salt

Heat a slick of olive oil in a large deep soup pot over medium-high heat. Add the onions and a big pinch of salt and cook, stirring frequently, until the onions are starting to brown and are translucent, about 10 minutes.

Add the carrots, celery, and bell peppers to the pot and cook for about 8 minutes more. Add the garlic and tomato paste. Cook for at least 5 more minutes, until the tomato paste starts to brown and stick to the bottom of the pan. Add the white wine and scrape up any stuck bits from the pot. Add the water and another large pinch of salt and bring to a boil.

Reduce heat, add the cabbage, and let simmer, just until the cabbage starts to get soft, about 10 minutes. Check the seasoning for salt and acidity (add a little red wine vinegar if the soup tastes flat) and black pepper.

When ready to eat, add the greens to the very hot soup and let them wilt and turn a vibrant green color. Serve with a scattering of parsley, and a slice of the toasted bread.



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* *J Agric Food Chem*. 2014 Jan 15;62(2):443-53.

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Cauliflower

BY LAURIE MATHENA

References
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Cauliflower has been a dinner staple for hundreds of years, but its popularity has recently increased with the invention of a new way to eat it: as *cauliflower rice*.

Cauliflower rice has the look and feel of rice, but is low in calories and carbs, and high in vitamins and minerals. But whether you're eating it steamed, roasted, or as a rice substitute, cauliflower's health benefits remain the same.

Cauliflower is a member of the *cruciferous* family of vegetables.

The health benefits of cruciferous vegetables like cauliflower are due in part to their **phytochemicals**, which have been shown to help induce detoxification, stimulate immune function, decrease the risk of certain cancers, inhibit DNA mutations, and reduce the proliferation of cancer cells.[1]

Cauliflower is also rich in **glucosinolates**, which are sulfur-containing compounds regarded as promising tools that reduce free-radical damage.[2]

Studies have also shown that compared to those with the lowest intake, people who eat the most cruciferous vegetables, like cauliflower, broccoli, and cabbage, have a decreased risk of overall **mortality**, especially death from **cardiovascular disease**.[3]

To make cauliflower rice, grate the cauliflower head using a box grater, then press it into an absorbent towel to remove excess moisture. It can be eaten raw or used as a rice substitute in dishes like stir-fries, risotto, tabouleh, or casseroles.

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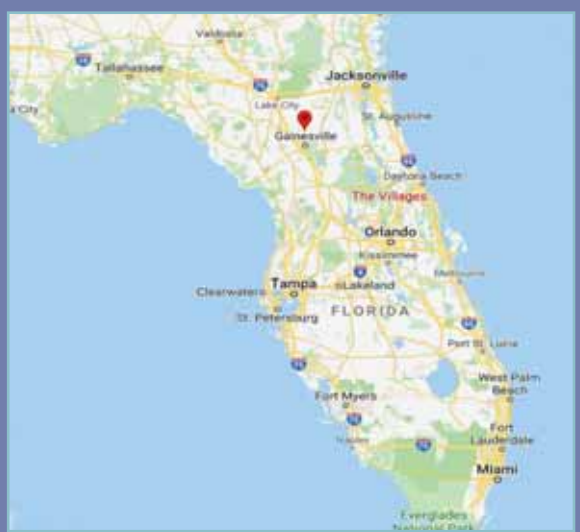

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