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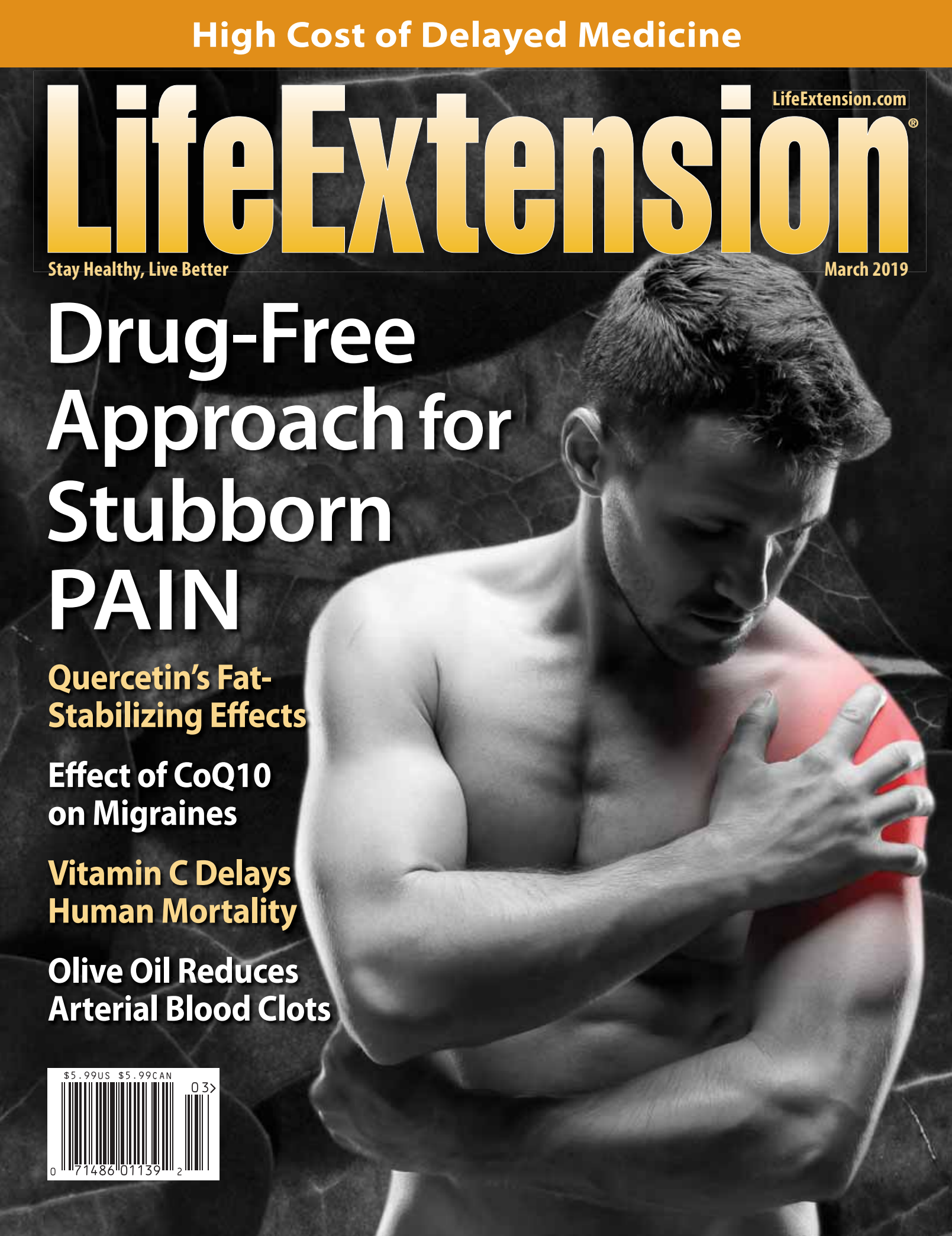

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LifeExtension® Magazine

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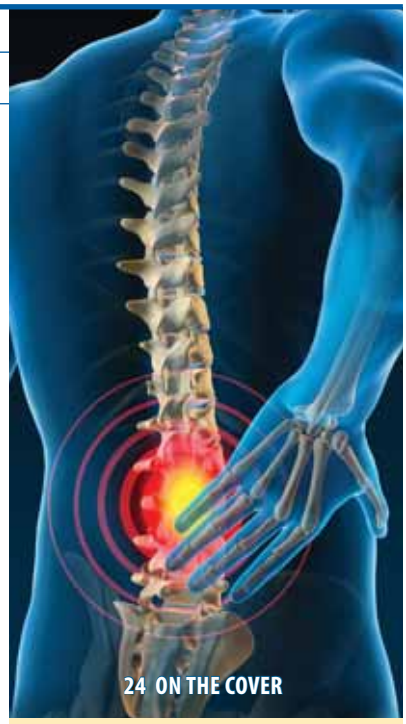

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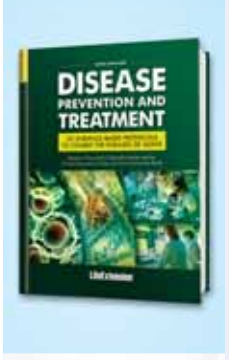

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Circulation & Distribution
Life Extension • 3600 West Commercial Blvd., Fort Lauderdale, FL 33309
Editorial offices: 954-766-8433 • fax: 954-491-5306

Customer Service: 800-678-8989
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LIFE EXTENSION (ISSN 1524-198X) Vol. 25, No. 3 ©2019 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: $40 per year in the United States. US $47 in Canada. US $60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA-approved, qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. *Life Extension Magazine*® does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in it, except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.

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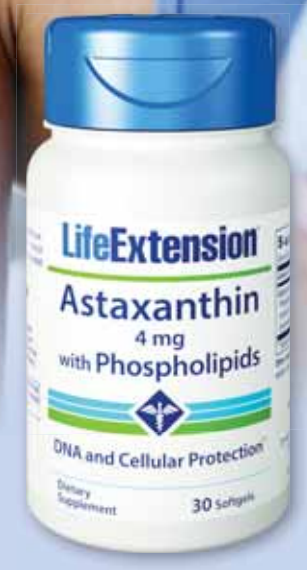

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BY WILLIAM FALOON

Why I Still Read Medical Journals

An epic change is occurring as to how people acquire new information.

Instead of picking up a book or magazine and viewing the **table of contents**, individuals are glued to **electronic screens**, which may limit them to only the specific information they request.

The downside of not reviewing scientific publications is that one might miss important **discoveries** that are not being explicitly looked for.

For this reason, I still read **medical journals** and am elated when I find new data that tie together concepts on how to better prevent and treat degenerative disease.

Alexander Fleming published findings about **penicillin** in **1929**,[1] but it did not become widely available until **1946**.[2] Millions died from **bacterial infections** during the **17-year** delay period.

Dr. Fleming was not the first to observe that certain **molds** had antimicrobial properties.

Beginning in **1870**, the **antibacterial** effects of *Penicillium* mold were observed by several scientists including **Louis Pasteur** and **Joseph Lister**.[3,4]

In **1897**, a researcher at **Pasteur Institute** wrote a dissertation showing a ***Penicillium*** mold was an effective **antibiotic** in animals.[5]

Just think how fantastic it would have been if at any time after **1870**, just one individual with sufficient resources had moved these "mold" discoveries forward. Millions of human lives would have been spared.

As it relates to **age-related** disease today, a similar scenario exists. Thousands of published, scientific studies describe better treatment options, yet remain ***ignored*** by mainstream medicine.

Penicillin Was Identified Decades Before Fleming

1870 England Sir John Scott Burdon-Sanderson observed that culture fluid covered with mold did not produce bacteria.

1871 England Joseph Lister experimented with the antibacterial action on human tissue of what he called *Penicillium glaucium*.

1875 England John Tyndall explained the antibacterial action of the *Penicillium* fungus to the Royal Society.

1897 France Ernest Duchesne wrote that *Penicillium glaucium* was an effective antibiotic in animals. Pasteur Institute ignored his dissertation.

1928 England Fleming discovered antibiotic penicillin from *Penicillium notatum* fungus.

1946 Penicillin becomes widely available to civilians.

Why You Can't Rely on Mainstream Reporting

Herbal therapies are often ridiculed by the media.

Yet many drugs used today originated from **botanical** extracts, such as **metformin** from **French lilac** and **aspirin** from **white willow bark**.

Curcumin may be the most exciting **botanical extract** that researchers are currently investigating. Yet compelling data about **curcumin** have been available to those who chose to read since the **1980**s.

Centuries-Long Delay in Curing Scurvy

As early as **1497**, the Portuguese discovered that **citrus** cured **scurvy**.[6]

It took over **200 years** for the scientific community to examine this reported cure, and even then, storing citrus for long voyages didn't become a standard protocol for another **50 years**.[6]

Long after the "citrus cure" was accepted, an **1870s** study failed to demonstrate efficacy because it used oxidized **lime juice**.[7]

Oxidation of the lime juice destroyed its **vitamin C** content, which was the **anti-scurvy** nutrient in citrus.

For the next several decades, scurvy once again sickened and killed. It was not until **vitamin C** was discovered in **1932** that scurvy was fully understood.[8]

The **400-year delay** in eradicating scurvy was ludicrous. Yet far more humans perish today because research findings are sadly **overlooked**.

A Neglected Cancer Treatment

Beginning in **1985**, we at **Life Extension®** began suggesting that certain cancer patients take a drug called **cimetidine** in addition to standard therapy.

The brand name of cimetidine is **Tagamet®**. You may have seen it advertised in the past for relief of **heartburn**.

While most people associate it only as a heartburn drug, cimetidine has several mechanistic **anti-cancer** effects.

When certain **colon cancer** patients take cimetidine after surgery and continue taking **800 mg** a day for one year, their 10-year survival rates improve dramatically.[9]

Cimetidine enhances the ability of the immune system to kill cancer cells and suppresses an adhesion factor that enables circulating tumor cells to establish metastatic colonies.[10-13]

I recommended cimetidine as an adjuvant cancer treatment 34 years ago based on studies showing that along with conventional therapy, cimetidine improves one's chances of long-term cure. Since then, hundreds of studies have been published demonstrating cimetidine's benefits against a number of malignancies.[9-15]

Yet not once have I had a cancer patient call and say their oncologist prescribed them cimetidine, which has been sold **over-the-counter** for the last few decades.

You may wonder how a low-cost drug like this is overlooked by the cancer establishment.

The problem is there is no outrageous profit to be made selling **cimetidine**. So TV commercials today advertise patented cancer drugs (like Keytruda®) that cost over $100,000 a year and are often less effective in improving survival than cimetidine.

Since there are no financial incentives to promote the cancer treatment benefits of off-patent drugs like metformin, valproic acid, and even aspirin in some cases, cancer patients have to find out about them on their own.

In a small clinical study published in **2018**, 10 out of 38 lymph-node-positive (stage 3) **colorectal cancer** patients were treated with **750 mg** a day of **cimetidine** before surgery and continued taking this dose for about a year.[14]

Compared to patients receiving standard therapy alone, those who also took **cimetidine** had an approximate **doubling** of time to recurrence and survival (cancer-related mortality).[14]

Said differently, the **cimetidine-treated** patients survived much longer without disease recurrence compared to those treated with standard therapy alone.

Although this is a small, uncontrolled study, it nevertheless shows consistency with several other clinical trials suggesting that cimetidine can provide benefits, including potentially increased survival, in carefully selected colorectal cancer patients.[9,15]

If you wonder why I keep reading medical journals, it's because studies like this are routinely published, but rarely make it into the news media.

Life Extension Magazine® uncovers these kinds of scientific findings and reports on them each month.

Disease Prevention and Treatment

Every day, researchers at **Life Extension**® identify novel ways to better prevent and treat common illnesses.

We publish much of this in ***Life Extension Magazine*** and in emails sent to our subscribers.

Most important, we meticulously catalog our findings. This enables us to update our ***Disease Prevention and Treatment*** textbook that is used at some progressive medical schools today.

I am pleased to announce an updated, 1,600-page ***Disease Prevention and Treatment*** is now available.

This is our 6th edition and an example of our commitment to bridging the gap between cutting-edge findings published in the peer-reviewed literature and what is not being implemented in mainstream medical practice.

Just one tidbit of underappreciated data, such as the **anti-cancer** properties of **cimetidine**, can result in enormous improvements in one's health and longevity. This and many other novel therapies are presented within the pages of ***Disease Prevention and Treatment***.

The expenses we incur analyzing and compiling this information far exceed the revenue we collect on sales of the book.

We nonetheless persist in this money-losing endeavor because of the many lives the information can save.

The retail price of this expansive new edition of ***Disease Prevention and Treatment*** is $99.95.

Until **April 18, 2019**, we are **discounting** the price down to **$39** and including **free shipping**.

To order the new 6th edition of ***Disease Prevention and Treatment***, call **1-800-544-4440** (24 hours) or visit LifeExtension.com/DPT

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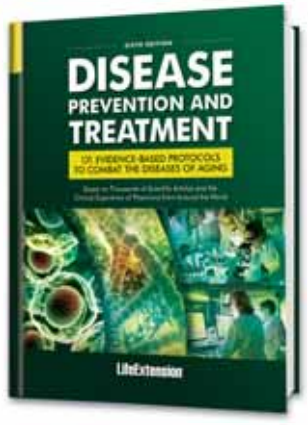

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Comprehensive Customer Care

Customer service has deteriorated into a labyrinth of recorded voice messages that force consumers to push a series of "buttons" in an attempt to reach a competent person.

That's not how **Life Extension** handles customer phone inquiries. We answer directly 24 hours a day, 7 days a week with courteous and knowledgeable staff.

An increasing number of you know to call our **Wellness Specialists** if you need suggestions based on what is published in the medical literature.

What sometimes happens is we get calls about a topic that was recently covered in ***Life Extension Magazine***. When we point this out, the caller often gratefully thanks us and then reads the article that pertains to their personal health concern.

My suggestion to our subscribers is to review our **Table of Contents** each month. There may be articles that describe improved methods of dealing with ***your*** specific health-related condition.

You don't want to overlook vital data, such as what was discovered about the bacteria-killing effects of **penicillin** molds in the era beginning in **1870**.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

Historic Analogy

Dr. Alexander Fleming was not the first to observe that certain **molds** were effective.

As I wrote in the beginning, **Louis Pasteur** and **Joseph Lister** observed the anti-bacterial effects of penicillin-like molds in **1870**.

In a tidbit of history we are challenged to fully document, a book purportedly advocated for the use of **mold** to treat common diseases back in the year **1640**.

The book titled, ***Theatrum Botanicum: The Theater of Plants***, was authored by **John Parkinson**, a botanist who operated an **apothecary** in London.

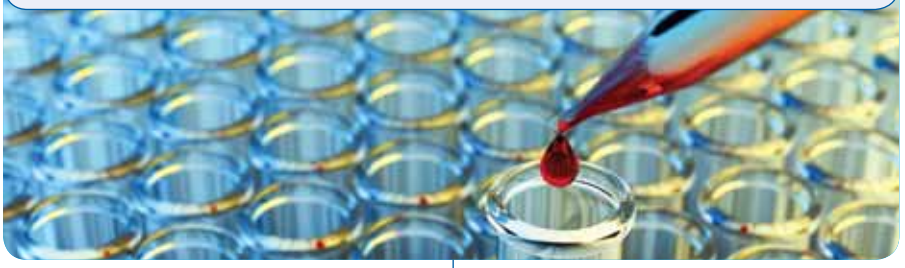
Back in those days, **bacterial** infections were the leading cause of death. If you fell ill and happened to read ***Theatrum Botanicum*** and/or visited John Parkinson's apothecary, you may have been prescribed a curative "mold" therapy.

When looking at this history, there may be a **300-year** gap between when certain **molds** were available to enlightened individuals in England and the time they became widely available drugs (**penicillin** in **1946**).

There are more examples today of effective therapies to prevent and treat diseases that are overlooked by the medical mainstream.

That's where the value of the ***Disease Prevention and Treatment*** book can be demonstrated.

Much of what we published decades ago has made it into conventional medical practice. Yet millions of Americans perished prematurely because they were unaware of effective therapies reported in highly respected scientific journals.



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Delays in Eradicating Smallpox

1796: **Dr. Edward Jenner** demonstrates **cowpox vaccine** efficacy

1797: Jenner's work rejected by **Royal Society**

1798: Jenner **self-publishes** findings of **cowpox vaccine** efficacy

1802: Parliament awards **Dr. Jenner** grant to expand his **research**

1837: Start of smallpox epidemic killing **42,000** British

1853: Cowpox **vaccine** made **mandatory** in England (children)

1857: Start of smallpox epidemic killing **14,000** British

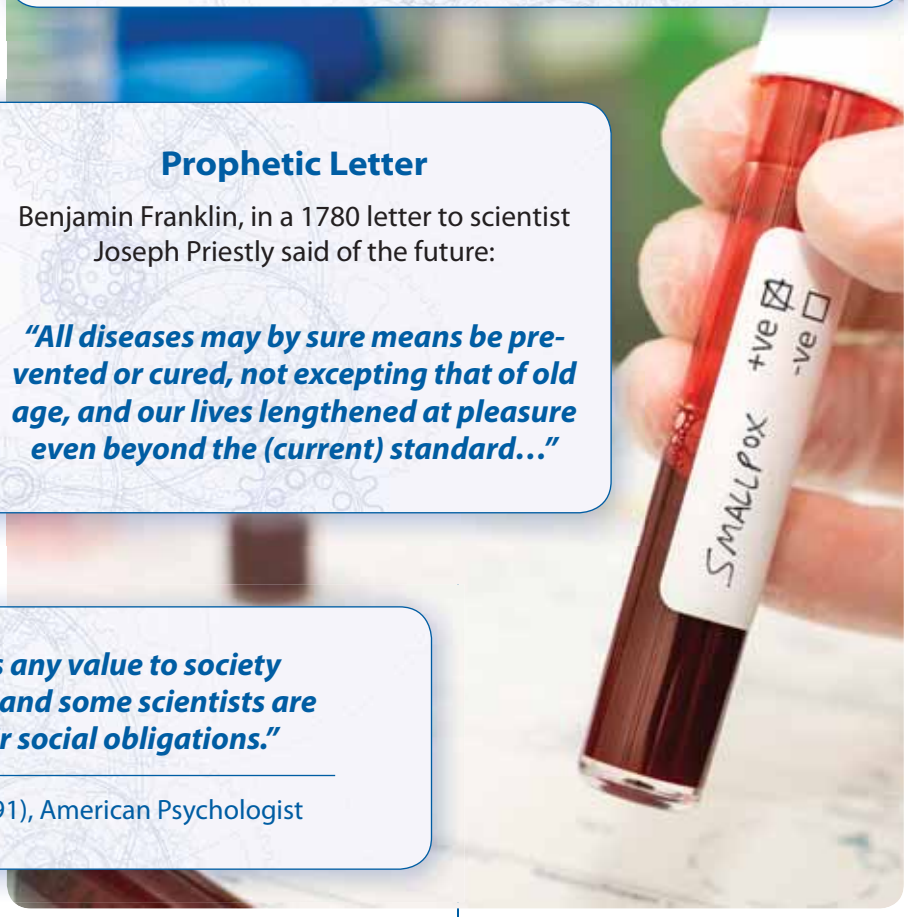
1863: Another smallpox epidemic claims **20,000** British lives

1872: Smallpox epidemic sweeps England killing **44,000** people

1901: Last smallpox epidemic in British Isles kills **2,700** people

Huge Numbers of Needless Deaths

George C. Kohn, Encyclopedia of Plague and Pestilence: From Ancient Times to the Present; Infobase Publishing, 2007



Prophetic Letter

Benjamin Franklin, in a 1780 letter to scientist Joseph Priestly said of the future:

"All diseases may by sure means be prevented or cured, not excepting that of old age, and our lives lengthened at pleasure even beyond the (current) standard…"

"Nothing in science has any value to society if it is not communicated, and some scientists are beginning to learn their social obligations."

Anne Roe Simpson (1904-1991), American Psychologist

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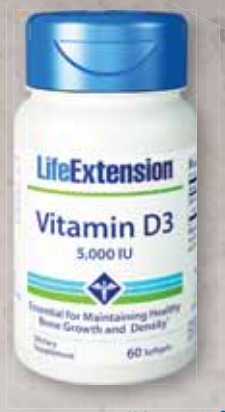

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References
1. *J Nutr.* 2000 May;130(5S Suppl):1437S-46S.
2. *Am J Clin Nutr.* 2007 Mar;85(3):837-44.

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About Health in a Different Light

Probiotics Benefit Bones

Swedish researchers have discovered protective effects for **probiotic** supplementation against bone loss that occurs in aging humans.*

In a randomized trial, 90 women ages 75 to 80, with low bone-mineral density were given a placebo or the probiotic *Lactobacillus reuteri* 6475 for 12 months.

Tibial bone-mineral density was assessed at the beginning and end of the study.

The women who received the powder with the added **probiotic** lost only half as much bone compared with those who received placebo powders.

Editor's Note: "Today there are effective medications administered to treat osteoporosis, but because bone fragility is rarely detected before the first fracture, there is a pressing need for preventive treatments," commented co-author Mattias Lorentzon, who is a chief physician and professor of geriatrics at Sahlgrenska Academy. "The fact that we have been able to show that treatment with probiotics can affect bone loss represents a paradigm shift. Treatment with probiotics can be an effective and safe way to prevent the onset of osteoporosis in many older people in the future."

**J Intern Med.* 2018 Jun 21.

Research Suggests Limitless Longevity

The journal *Science* reports the conclusion of researchers from the University of California, Berkeley and Sapienza University of Rome that the risk of death, which increases exponentially up to an approximate age of 80 years, appears to level off after the age of 105.*

The findings contradict recent speculation by some biologists and demographers that there's a fixed natural limit to human life.

"Theories about biological limits to lifespan and evolutionary shaping of human longevity depend on facts about mortality at extreme ages, but these facts have remained a matter of debate," say lead author Elisabetta Barbi and her colleagues.

Among 3,836 residents of Italy between the ages of 105 and 109 years, there was a 50/50 chance of dying within one year and an anticipated additional lifespan of 1.5 years. These projections were the same for supercentenarians aged 110 and older, indicating a plateau effect.

Editor's Note: In contrast, among women aged 90, the chance of dying within a year was found to be **15%** and further life expectancy was 6 years, and for 95-year-old women, the one-year risk of mortality increased to **24%** while life expectancy declined to 3.7 years.

**Science*. 2018 Jun 29;360(6396):1459-1461.

Lower Mortality Risk Among Coffee Drinkers

A study involving close to half-a-million men and women found an association between increased **coffee** intake and a decline in mortality during a decade of follow-up, regardless of the presence of genetic variations that impact caffeine metabolism.*

The current investigation included 498,134 participants in the UK BioBank study. Questionnaires completed between 2006 and 2010 provided data concerning diet, including coffee consumption. Subjects were followed for an average of 10 years, during which 14,225 deaths occurred.

Compared to the risk of death during follow-up experienced by subjects who did not drink coffee, drinking less than a cup of coffee daily was associated with a **6%** reduction in premature mortality. One cup was linked with an **8%** lower risk, 2 to 5 cups with a **12%** reduction, 6 to 7 cups with a **16%** decrease and drinking 8 cups or more with a **14%** lower risk.

Editor's Note: The presence of genetic variations that indicate slow or fast caffeine metabolism did not appear to affect mortality risk and the associations were valid for both regular and decaffeinated coffee, which suggests that compounds other than caffeine may be the protective factors.

* *JAMA Intern Med.* 2018 Aug 1;178(8):1086-1097.

Nondiabetics Can Have High Glucose Spikes

A study reported in *PLOS Biology* reveals surprisingly high levels of post-meal **glucose** among healthy individuals.*

The study evaluated the findings of continuous glucose monitoring in 57 nondiabetic participants.

Use of a continuous glucose-monitoring device provides a better picture of glucose behavior throughout the day, as opposed to blood tests that evaluate fasting glucose or hemoglobin A1c.

After consuming three different standardized breakfasts (corn flakes with milk, bread with peanut butter, or a nutrition bar), the intensity of individual responses to the meals characterized the subjects as one of three "glucotypes": low, moderate, or severe.

"We were very surprised to see blood sugar in the prediabetic and diabetic range in these people so frequently," lead author Dr. Snyder remarked. "The idea is to try to find out what makes someone a 'spiker' and be able to give them actionable advice."

Editor's Note: "There are lots of folks running around with their glucose levels spiking, and they don't even know it," commented Dr. Snyder, who is a professor and chair of genetics at Stanford University. "We saw that some folks who think they're healthy actually are misregulating glucose—sometimes at the same severity of people with diabetes—and they have no idea."

* *PLoS Biol.* 2018 Jul 24;16(7):e2005143.

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4. Available at: http://www.sabinsa.com/newsroom/WhitePapers/Probiotics_For_Health_And_Well_Being_Nutra.pdf. Accessed September 30, 2015.

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* US Patent 6,723,368; 8,357,419.

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Turn Off the Pain Signal

A SAFE APPROACH TO PAIN

BY MICHAEL DOWNEY

More than **100 million** Americans experience **chronic pain**.

That number exceeds those suffering from heart disease, cancer, and diabetes—*combined*.[1]

Pain-relieving drugs often fail to heal injured tissue. While these drugs can alleviate outward symptoms, they fall short of addressing the underlying causes.

Scientists have discovered a **fatty acid** naturally found in the body that targets the underlying cause of chronic pain. It works at the ***pain site*** to ***turn off*** the pain signal.[2,3]

More importantly, by working at the **site** of the original injury, this ***peripherally-acting*** fatty acid helps break the inflammatory pain cycle. [2,3]

Clinical studies show reductions in pain after **14-30 days**—and sometimes sooner.[4-6]

The Problem with Pain Relievers

Common pain relievers come with inherent risks. Yet the over-prescribing of these drugs has become a standard practice—with devastating results:

- Current users of **ibuprofen** (for 1-7 days) have **1.48-fold** greater odds of suffering a heart attack.[7]
- Current users of **naproxen** (Aleve®) (for 1-7 days) have **1.53-fold** greater odds of suffering a heart attack.[7]
- Regularly taking **NSAIDs** (non-steroidal anti-inflammatory drugs) (such as ibuprofen) increases the risk of kidney impairment by **32%**.[8]
- Over-prescribing of addictive opioids has led to an epidemic resulting in more than **500,000** deaths since the year 2000.[9]

Despite the widespread availability of these drugs, more than **116 million** American adults *still* live with chronic pain.[10]

A Safe Pain-Relief Alternative

A safer alternative is urgently needed.

Scientists have been aggressively researching safer alternatives to relieve pain.

This led them to a natural fatty acid compound called **PEA** (palmitoylethanolamide) that works at the site of tenderness to turn off the pain signal.[2,3]

In clinical studies of PEA, noticeable reductions in pain were seen after **14-30 days** of supplementation—and sometimes in as little as **one week**.[4-6]

PEA has an extraordinary safety profile. It does not result in dependence or addiction, because—unlike opioid pain-relievers—it does not involve the body's **opioid** receptors.

Proper use of PEA represents an innovative, safe, and effective advance in the long-term management of pain.

PEA Blocks Pain

PEA is a fatty acid the body naturally produces to lower **inflammation**.[11,12]

In recently published animal studies, researchers demonstrated that PEA downregulates distinct inflammatory and oxidative pathways and significantly relieves chronic inflammatory and neuropathic pain.[13,14]

Multiple clinical trials and other human studies, involving more than 1,100 participants, have established the validity of PEA as a powerful, ***peripherally-acting*** pain reliever.[2,3] Peripherally-acting compounds work at the site of the original injury, helping to *normalize* the body's response to tissue damage.

Unlike commonly used pain-relieving drugs, PEA has no documented cardiovascular or renal risk.[2] Clinical studies on PEA highlight its safety and efficacy even when used in combination with common pain relievers.[5,15]

This type of approach has produced beneficial results, as we'll now see.

PEA Relieves the Most Common Form of Pain

Investigators chose to test PEA against **sciatica nerve pain**, a condition that involves inflammation and pressure on the main nerve supplying the back portions of the leg. Sciatic pain is one of the most common forms of chronic pain, affecting up to **43%** of people.[16]

For this study, 636 patients with sciatica pain were randomly assigned to receive either a placebo, **300 mg** of PEA, or **600 mg** of PEA daily.[5]

After three weeks, both groups of people taking PEA experienced significantly better **pain reduction** and **quality-of-life** scores compared to placebo recipients. Those taking the higher dose had the most improved outcomes.[5]

This study also revealed that PEA provides pain-reducing effectiveness that *surpasses* most pharmaceutical standards.

Researchers frequently estimate how many patients would need to be treated in order to achieve a **50%** reduction in pain. This is known as the "***number needed to treat***." Any number below **five** indicates a useful pain intervention, with a measure of **one** being the statistically perfect ideal.

In this PEA study, the number needed to treat was just under **three** by the second week of treatment. And by week three, the number needed to treat was down to a virtually unheard-of **1.5**![5,17]

This indicates that PEA has a remarkably high degree of effectiveness in pain reduction.

PEA Proven Safe and Effective Against Migraines

Migraine headaches are the sixth highest cause of years lost to disability worldwide.[15]

There are two major types: migraines with **aura** and migraines without aura.

Auras are constellations of neurological symptoms that usually occur before the onset of a migraine, though they can also occur during a migraine. Auras can also occur without any migraine headache, and individuals who have migraines with aura can also have migraines in which no aura occurs. Auras usually last just a few minutes and are most commonly visual, though they can affect other senses, verbal ability, or the motor nervous system.[18,19]

A single-blind, clinical study was conducted to assess the safety and efficacy of PEA in 20 sufferers of migraines who experienced severe pain as well as visual aura. Each was given **1,200 mg** of PEA daily for 90 days, and all were evaluated at 30, 60, and 90 days. They also took NSAIDs such as ibuprofen at the onset of an acute attack.

Superior Pain-Relief

- **Pain-relieving drugs come with inherent risks, and people who rely on these medications may not be aware of the potential damage they can cause.**
- **Chronic pain demands treatment that targets its underlying cause at the site of the tissue damage.**
- **PEA reduces inflammatory stimuli at the site of tenderness to turn off the pain signal.**
- **PEA offers a safe, non-addictive option for those suffering from *occasional minor pain* and *discomfort*. In addition, it has been shown to reduce reliance on other pain medications. This may radically alter how pain is managed in the future.**

What You Need to Know

The Hidden Dangers of NSAID Use

Some of the most commonly used pain medications are the **non-steroidal anti-inflammatory drugs** or **NSAIDs**. These drugs reduce levels of **prostaglandins**, compounds that initiate acute inflammation and increase sensitivity to pain, by blocking an enzyme called **cyclooxygenase** which is required for their production.

Because the most common NSAIDs (such as ibuprofen and naproxen) are available over-the-counter, without a prescription, millions of people self-prescribe for their pain control with these drugs.

Unfortunately, despite their wide availability, NSAIDs are not as innocuous as many people believe. While they are generally safe for short-term use over a few days, longer use can be very dangerous, even lethal. Considering that many people use NSAIDs for chronic types of pain, such as back pain or arthritis, this presents a serious problem.

Although NSAIDs reduce inflammation in some parts of the body, prolonged use can cause injury and inflammation in the stomach, leading to **gastritis** and **ulcers**. These can be associated with **gastrointestinal bleeding** and even rupture, which can be life-threatening.[22]

Even relatively short-term use of NSAIDs is also associated with an increased risk of **heart attack** and **stroke**.[7,23,24]

Even more insidiously, NSAIDs can cause damage to the kidneys.[8,25] With prolonged use, this can contribute to the development of **kidney failure** and the need for **dialysis** or a **kidney transplant**. Oftentimes the damage being done is not noticed until it is too late, unless it is detected on blood tests of kidney function.

Although the risk for serious kidney injury with NSAID use appears worst in those with pre-existing kidney disease or other risk factors like high blood pressure, significant damage can occur even in younger, previously healthy individuals.[25]

The take-home message is that NSAID use should not be taken lightly. It is recommended to limit their use overall, substituting safer alternatives when possible.

At 60 days, PEA-supplemented patients experienced dramatic improvement in reducing pain symptoms, and this effect continued until the 90-day follow-up. Remarkably, at 90 days, this treatment group demonstrated a reduction in the number of migraine attacks per month and a reduction in the number of painful days. And there were no adverse effects.[15]

Critically, daily use of PEA allowed patients to reduce the dosage of toxic NSAIDs.[15]

Inhibiting Inflammatory Pain Signals

In another study, scientists put PEA to the test against another common type of pain: **carpal tunnel syndrome**.[4]

Carpal tunnel syndrome occurs as a result of compression of the nerves that extend through a narrow space in the wrist, and it results in tingling, weakness, or numbness in the hands.

In this study, patients who received no treatment acted as controls, while others were given either **600 mg** or **1,200 mg** of PEA daily.

After 30 days, the patients taking PEA reported reductions in **symptoms** and **discomfort** compared to the controls. They also experienced improvements in **nerve conduction** studies along the median nerve.[4]

These improvements are clinical indicators of a reduction in pain-related inflammation and improved function.[4]

In the compelling studies above, PEA proved to be an effective pain-reliever when compared either to a placebo or to no treatment at all.[4,5]

Next, scientists set out to evaluate how well PEA would perform when matched against a proven pain-killing drug.

PEA Outperforms Ibuprofen

To test this, researchers conducted a randomized, placebo-controlled study comparing the pain-relieving effects of **PEA** to **ibuprofen** (Advil®, Motrin®).

The patients suffered **temporomandibular joint** (TMJ) **pain**, an often chronic condition that causes severe jaw discomfort.[6]

For the study, 24 patients with TMJ were divided into two groups. One group took **600 mg** of ibuprofen three times daily for two weeks, while the other group took **300 mg** of PEA in the morning and **600 mg** in the evening for the first week and then only **300 mg** of PEA twice daily for the second week.[6] (The **1,800 mg** a day dose of ibuprofen is dangerously high, yet many chronic-pain sufferers take it anyway.)

Within just two weeks, those taking PEA experienced a *greater* decrease in pain than those taking high-dose **ibuprofen**. They were also able to open their mouths wider (an indicator of range of motion) and with less pain than those in the ibuprofen group.[6]

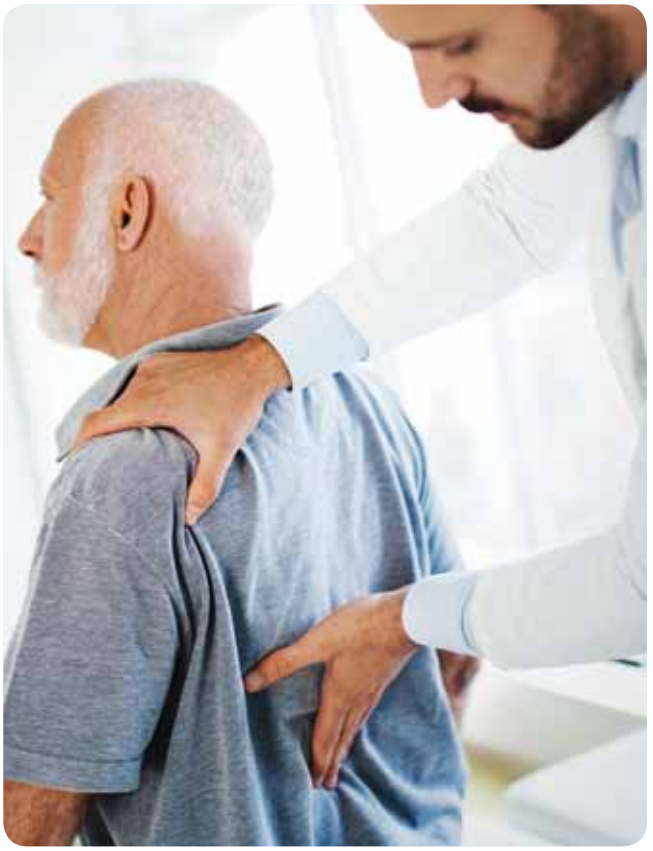
Importantly, PEA accomplished these benefits without any side effects. These results were consistent with a **2018 review** that found, *"None of the clinical trials with PEA to date have reported treatment-related adverse events."*[20]

A Potential Role for PEA in Neuroprotection

PEA reduces inflammation at the peripheral site of pain, making it a powerful pain-reliever for chronic pain.[4-6] New evidence suggests that PEA may also act in the central nervous system to quench neuroinflammation.

A recent study suggests that PEA's anti-inflammatory effects in combination with levodopa therapy may also help slow the progression of **Parkinson's disease**.[21]

Thirty patients with advanced Parkinson's who were being treated with the drug levodopa were given a battery of cognitive tests before and after treatment with PEA. They received **1,200 mg** of PEA daily for three months, followed by **600 mg** daily for up to a year.[21]



Investigators documented a significant and progressive reduction in both motor and non-motor symptoms.

Astoundingly, after a year of PEA supplementation, the number of patients who exhibited any symptoms had been reduced—a previously unheard-of reversal in this chronic disease's progression.[21]

Larger randomized and controlled clinical trials may yet reveal new potential for PEA to reduce neuroinflammation and improve the ability to protect against neurodegenerative diseases.

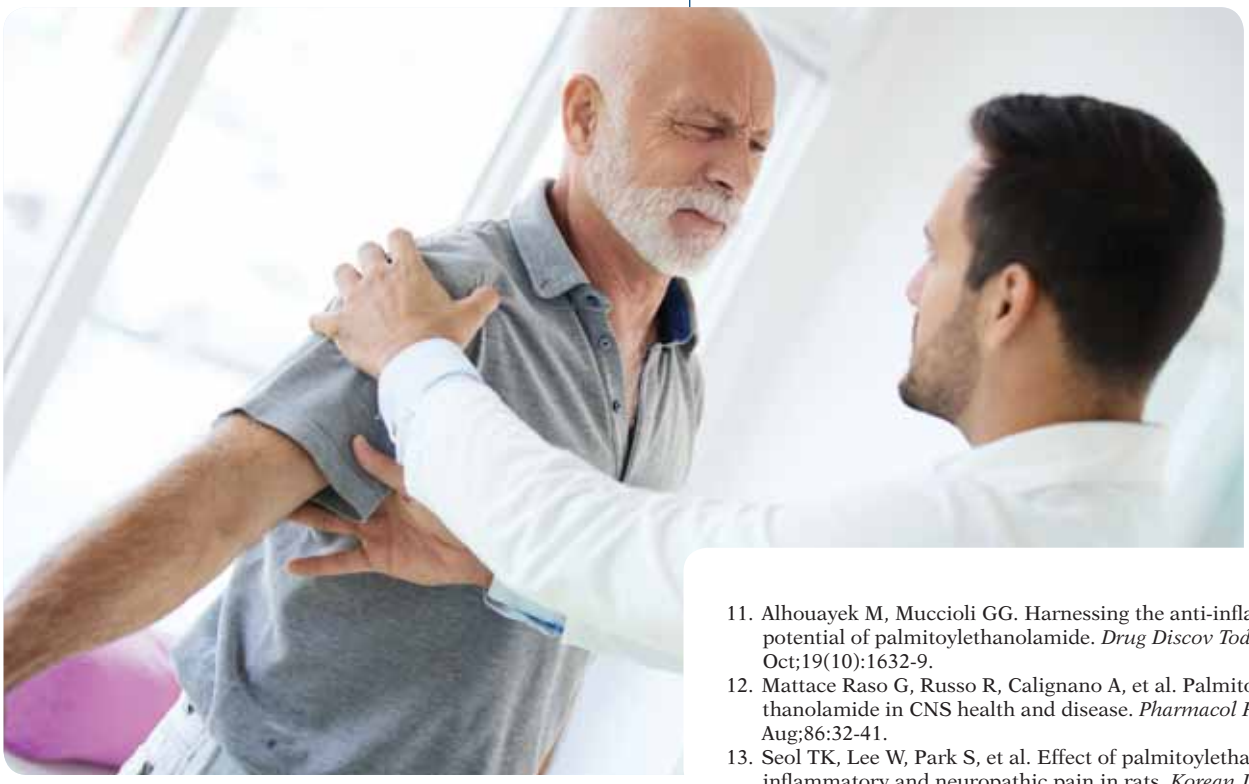
Summary

Chronic pain often involves both peripheral inflammation as well as amplification of the perception of pain within the brain.

Long-term treatment with pain-relieving drugs involves a high risk of adverse effects and fails to target the underlying cause of **chronic pain**.

PEA functions to suppress painful inflammatory stimuli that persist at sites of injury. ●

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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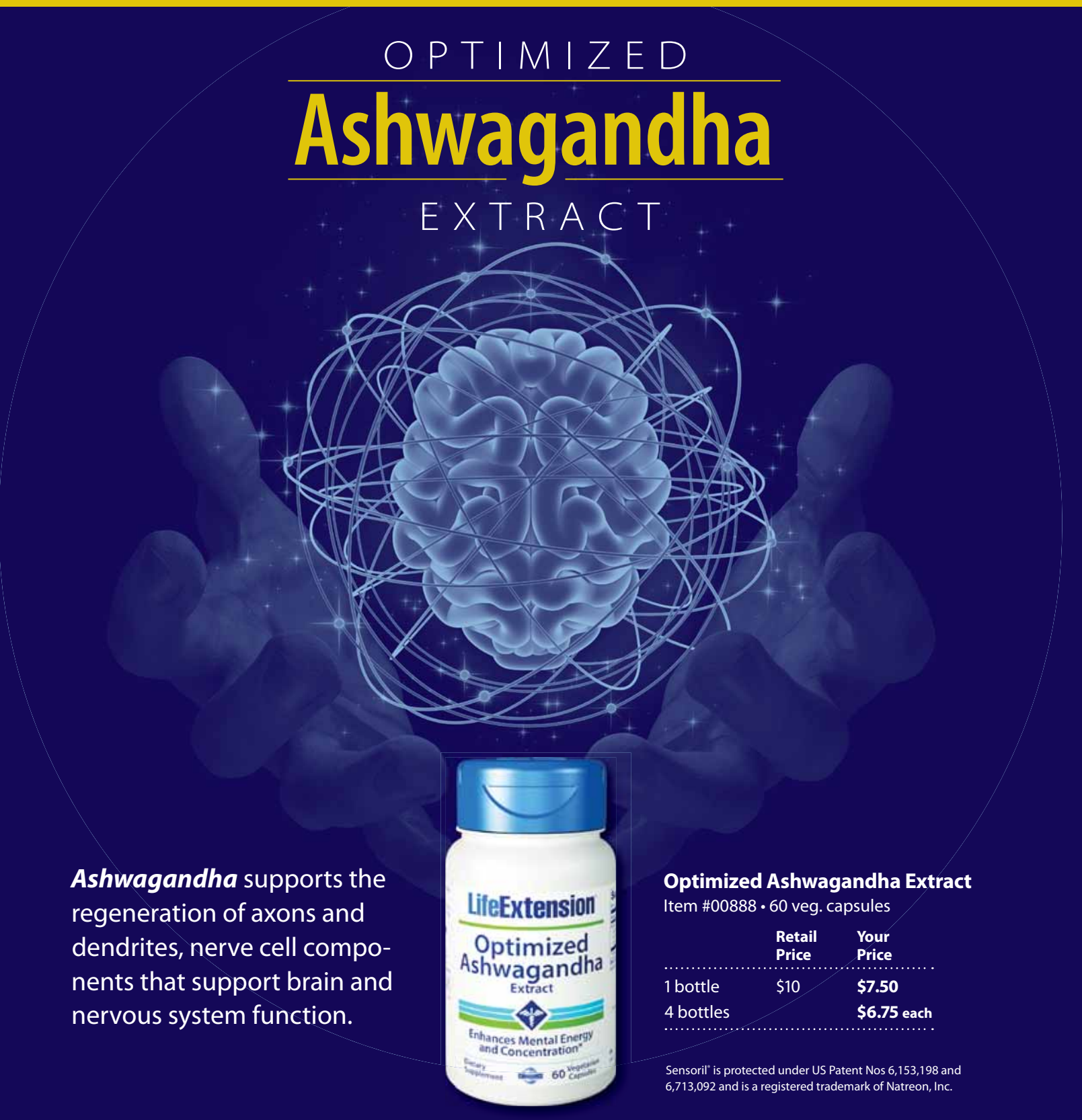

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BY ROBERT ANDERSON

Protect Against Damage Caused by Excess Weight

Obesity is a major threat to longevity and health.

In addition to physically burdening the body's structure, fat cells accelerate disease risk and aging. They do this by churning out enormous amounts of **inflammatory** factors.[1]

Quercetin is a bioactive flavonoid found in onions, apples, and other botanical sources.

In an animal study published in **2018**, quercetin was shown to **prevent** obesity, while also offsetting the damaging effects of excess fat tissue.

With more than **2** in **3 adults** considered overweight or obese,[2] these new results show that quercetin may represent a defense against the age-accelerating consequences of **excess fat**.

The Dangers of Excess Fat

Obesity imposes grave risks on our health, especially as we age.

It increases the wear and tear on all body systems and raises blood lipid levels.

It also has ongoing effects that are less visible yet are more life-threatening.

When fat cells (adipocytes) and fat storage sites (adipose tissue) increase in size, an environment of insufficient oxygen supply (hypoxia) sets in, leading to cellular and biochemical changes.[3]

For example, ***hypoxia*** alters how fat cells express their genes, with the ultimate development of **system-wide inflammation**.[4]

Widespread inflammation is accompanied by metabolic disruptions. These include not only insulin resistance, type II diabetes, and fatty liver disease, but also atherosclerotic changes in blood vessels, heart disease, and stroke.[5,6]

Inflammatory changes in the brain and bone lead to neurodegenerative disorders and osteoporosis, respectively.[7,8] At some point, DNA repair mechanisms and cell replication controls are lost, with a concomitant spike in cancer development.[6,9]

In short, fat tissue is perhaps the most powerful accelerator of aging.

Quercetin Prevents Obesity

The first step in protecting against obesity-related health dangers is to prevent diet-induced obesity in the first place.

A study published in early **2018** showed that quercetin could help prevent diet-induced obesity—even in the presence of a high-fat diet.

For the study, rats were fed either a normal diet, a high-fat diet, or a high-fat diet along with a quercetin-rich dietary supplement.[10]

After 8 weeks, rats in the groups fed high-fat diets gained weight compared with those on a normal diet. However, the quercetin-supplemented rats fed a high-fat diet gained **8.5%** ***less*** weight by the end of the study, compared with those fed the high-fat diet alone.[10]

The prevention of weight gain was accompanied by impressive protections against **internal** fat accumulations. By the end of the study, compared to high-fat diet controls, quercetin-supplemented animals on high-fat diets had:

- **23%** less total body fat,
- **23.8%** lower serum triglyceride levels, and
- **22%** less visceral (abdominal) fat.

Improvements at the Cellular Level

These macroscopic improvements in body weight, fat distribution, and lipid profile were accompanied by microscopic changes in the architecture of liver and fat cells.[10]

Healthy, lean animals have dense, well-organized liver cells lacking any droplets of free fat.

Rats fed a high-fat diet have loose, poorly-organized liver tissue riddled with droplets of free fat that won't stay in cells.

Lean animals have compact, small fat cells, while rats fed a high-fat diet have enlarged, overfilled fat cells.[10]

These changes in the structure of the cell negatively impact health because a liver loaded with fat cells (fatty liver) is a highly inflammatory environment.[11] This situation may lead to poor liver function, declining insulin sensitivity, and eventually to liver damage leading to cirrhosis, fibrosis, and liver failure.

Large, unhealthy fat cells elsewhere in the body only add to the inflammatory burden[12]—which adds to the risks of inflammation-driven diseases like heart attacks, strokes, cancer, and even osteoporosis.

This study found that when rats fed a high-fat diet were also fed a **quercetin**-rich supplement, the architecture of their liver and fat cells changed to closely resemble

those of **lean** animals fed a normal diet, with few liver oil droplets and small, orderly fat cells.[10]

Overall, this study shows that quercetin helps reduce diet-induced weight gain while also protecting tissues from excessive, destructive fat inflammation.

But what we learn from this study is only a portion of the story. Still more exciting is the emerging picture of what quercetin can do to **existing** fat stores—activity that amounts to a ***detoxification of fat tissue***.

The result is the promotion of health and deceleration of aging.

Quercetin's Multi-Targeted Effects

Two animal studies published in the past several years have demonstrated that supplementing with quercetin contributes to significant reductions in body weight—while also protecting against the dangerous impact of diet-induced accumulation of fat.[13,14]

Together, these studies offer a comprehensive picture of quercetin's ability to attack obesity on multiple levels.

Here are the four primary ways quercetin accomplishes these feats.

Quercetin Reduces Fat-Generated Inflammation

Animal studies show that supplementation with quercetin (when given in combination with resveratrol) works in two key ways to reduce obesity-induced inflammation.

First, quercetin precisely controls the genetic expression of pro-inflammatory signaling molecules (cytokines). In addition, this nutrient combination has been shown to produce significant reductions in the size of body-fat stores, to lower body weight, result in smaller fat- cell sizes, and reduce blood lipid levels.[15]

An even more striking finding is quercetin's effect on the hypothalamus, the body's central metabolic regulatory center.[16]

Obesity can activate the immune cells of the central nervous system, called ***microglia***, producing destructive, localized inflammation, including in the hypothalamus. Inflammation in the hypothalamus has far-reaching consequences because of its intimate involvement in everything from core body temperature to basal metabolic rate to appetite and activity.

By activating microglia, obesity has been implicated in upsetting the ways the body manages its energy balance, as well as in metabolic complications like diabetes, and in neurodegenerative diseases.[17-22]

A recent animal study found that quercetin can reduce obesity-induced inflammation in the hypothalamus of obese mice. It accomplishes this by inducing an enzyme that protects brain tissues against oxidative stress that drives inflammation.[16]

By reducing fat-generated inflammation, quercetin combats a potent age-accelerator.[15,23]

Quercetin Upregulates AMPK

AMPK is one of the body's central metabolic regulatory signaling enzymes and is found in every living cell. It is considered one of the body's most powerful **anti-aging tools**.

When activated, AMPK enhances rates of energy extraction by burning fat, and accelerating cleanup of toxic debris that accumulates inside aging cells (autophagy).

Quercetin has been shown to activate AMPK.[14,15] Doing so promotes a more ***youthful*** cell type in terms of activity and vulnerability to stress of all kinds.[24-26]

A study of rats fed a high-fat diet (which induced obesity) showed that quercetin stopped fat-induced suppression of AMPK. This freed the animals' cells to revert to more youthful activity, while also reducing many inflammatory processes.[15]

Quercetin Promotes a Healthy Gut Microbiome

The gut microbiome is the community of millions of microorganisms that live in the intestinal tract. Obesity contributes to an imbalanced microbiome (called ***dysbiosis***), a problem that is closely related to a wide range of human health issues, including diabetes and cardiovascular disease.[27-29]

Research suggests that obesity-related dysbiosis may produce "leaky gut,"[30] a condition that allows bacterial toxins to enter the

bloodstream, while promoting liver damage and excessive inflammation.

In a mouse study, treatment with quercetin ***restored*** balance to the gut microbiome and **turned off** dysbiosis-related inflammatory and stress responses.[31]

One dramatic consequence of this effect of quercetin is a reduction in the severity of obesity-induced, **non-alcoholic fatty liver disease** (NAFLD).[31]

NAFLD is a serious consequence of **insulin resistance** and can lead to non-alcoholic steatohepatitis, which is a precursor of liver cirrhosis and even liver cancer.[32]

Supplementing with quercetin achieves these gut-microbiome-related results by interacting with the many species that make up the gut microbiome. It stops the growth of bacteria that have pro-inflammatory and other harmful properties, while promoting the growth of bacteria known to protect the gut by producing mucous and anti-inflammatory compounds.[23,33]

In short, quercetin ***harnesses gut bacteria*** as allies in the fight against total-body impacts of obesity.

Quercetin Converts White Fat to Brown Fat

The bulk of fat tissue in adults is composed of ***white adipose tissue***, or simply "white fat."

This type of fat is what provides our energy supply between meals.[34] Unfortunately, it is also the source of inflammation and other harmful metabolic changes associated with excessive fat stores.[11,27]

But infants (and many small mammals) have fat deposits that are made up of ***brown adipose tissue***, or simply "brown fat." Unlike the white variety, brown fat has the capability of converting energy stored as fat into heat.[35,36]

Research shows that mice with increased numbers of brown fat cells are lean and protected from obesity, compared with those dominated by white fat.[37]

We're now learning that it's possible to boost brown-fat-cell content in human adults by triggering the cellular switch from white to brown.[34-41] The result is the conversion of stored fat into fat that is burned for energy and readily shed from the body.

It's a discovery that is **revolutionizing** our approach to obesity—and quercetin could play a major role.

Animal studies have now demonstrated that **quercetin**—either alone or in combination with **resveratrol**—can convert white fat cells into those resembling brown fat cells.[40,42,43]

This "browning" process is a promising strategy for mitigating the impact of obesity.[42]

As an added benefit, quercetin-induced fat-browning increases the activity of PPAR-alpha, a gene regulator that promotes the expression of genes involved in burning fat and glucose.[40]

Summary

Obesity is a major threat to human health and longevity.

Excessive amounts of certain types of fat tissue generate inflammation that accelerates the aging process and leads to insulin resistance, diabetes, heart disease, cancer, osteoporosis, and even neurodegenerative disorders.

Quercetin has been shown to help protect against obesity itself, as well as its age-accelerating consequences. ●

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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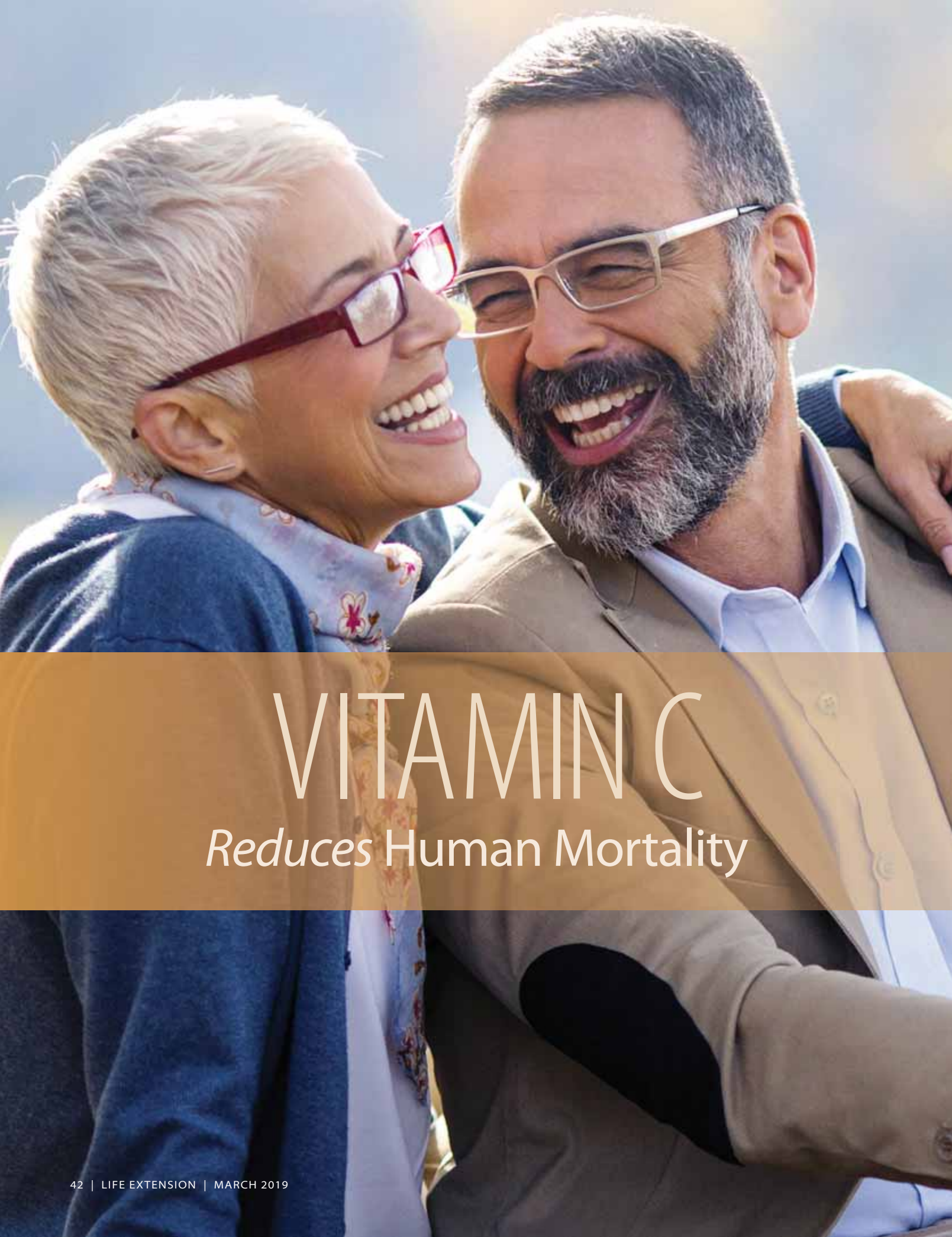

VITAMIN C

Reduces Human Mortality

BY EMILY WATSON

Humans do not internally produce **vitamin C**.

Diets provide enough vitamin C to avoid **scurvy**, but nowhere near what may be optimal doses.

Researchers have found that vitamin C promotes a **longer lifespan** and can help prevent many of the disorders related to aging, including cancer.

In a major new study, people with ***higher*** blood levels of **vitamin C** were at significantly lower risk for **heart disease** and **cancer** death—and were up to **25% less likely to die** from *any cause*.[1]

Vitamin C shows potential to significantly improve the quality of life.

Effect of Vitamin C on Mortality

In a new study, researchers examined vitamin C blood levels and their relationship with patients' health.[1]

The study involved 948 randomly selected, healthy men and women aged 53 to 84, whose blood was collected in 1999-2000.[1] Subjects were closely followed for the next *16 years*, and their health was tracked.

What the study showed was that people whose 16-year-old blood samples contained the ***highest*** levels of vitamin C back then had significantly lower risks of dying now.[1]

The differences were dramatic. Those in the ***highest*** quartile of baseline blood vitamin C levels were **25% less likely to die** than those in the lowest quartile.[1]

Finally, when the researchers analyzed data by disease type, they found that those in the top quartile of blood vitamin C levels in 1999-2000 were at a lower risk for both heart disease and cancer deaths16 years later .[1]

Many other studies also show a clear link between vitamin C and leading a long, healthy life.

While higher vitamin C levels are associated with people who practice healthier behavior patterns, this study nonetheless shows striking reductions in mortality rates in those with the highest blood levels of vitamin C.

Boosting Longevity

Animal studies show that vitamin C can **reverse** several age-related abnormalities in tissues. This includes reducing inflammatory responses, protecting DNA integrity, and reducing biomarkers of cellular stress. When left unaddressed, all of these are associated with rapid aging.[2-5]

Research demonstrates that vitamin C supplementation can extend lifespan in a primitive worm often used in longevity testing.[5]

Studies in mice show even more dramatic results. Humans are among the very few mammals not capable of making their own vitamin C and so they must obtain it from their diet. Scientists did a series of studies using mice that were genetically engineered to age prematurely *and* require dietary vitamin C.[2-4]

These studies found that in the absence of significant dietary vitamin C, the mice have a severe reduction in lifespan, and have numerous metabolic abnormalities that resemble those of older humans.[2-4]

But when vitamin C is added to their diet, the animals' **lifespans were significantly increased**, and all metabolic abnormalities were resolved.[2-4]

The evidence is clear: Vitamin C is an important component to healthy longevity. The results are even more remarkable when scientists examine the role of vitamin C in specific diseases that cause premature death in humans.

Vitamin C and Cancer

Vitamin C is powerful in reducing the oxidative stress that can trigger DNA damage, leading to cancer initiation, and it can inhibit the inflammatory response that promotes tumor growth.[6,7]

Taking vitamin C supplements reduces markers of oxidative stress in non-smokers exposed to second-hand smoke. Vitamin C supplements have also been shown to reduce damage to human cells that was caused by exposure to radiation.[6,8]

In fact, some recent studies recommend vitamin C and other antioxidants as ideal protection for patients before undergoing imaging studies that use radiation (like X-rays and CT scans).[8]

The vitamin may act directly on developing malignancies as well. Vitamin C can generate hydrogen peroxide, which **destroys rapidly-replicating cancer cells**.[7,9]

Gastrointestinal cancers are among the most common and most preventable malignancies.

A large clinical study found that higher vitamin C levels were strongly linked to a lower risk of stomach cancer (*gastric adenocarcinoma*). For each **0.35 mg/dL** increase in blood levels of vitamin C, there was a **14%** reduction in risk of this tumor. Compared to people with the lowest vitamin C levels, those with normal concentrations had an overall **27%** reduction in **stomach cancer** risk.[10]

Breast cancer studies show a similar result: Women with the highest intake of vitamin C *prior to a cancer diagnosis* were **25% less likely to die** from the disease compared to those with the lowest levels.[11]

In experiments with normal mice *and* those genetically engineered to express human genes (including lack of vitamin C synthesis), all normal animals developed mammary cancers after implantation with human breast cancer cells. In mice bearing human genes there was a reduced growth when given modest vitamin C supplementation. Moreover, in the engineered mice on ***higher***-dose vitamin C, none developed tumors.[12]

Vitamin C Adds Cardio Protection

Research into vitamin C and cardiovascular disease has shown that the vitamin can act at multiple pathways involved in the development of atherosclerosis, arterial blockage, and the resulting heart attacks and strokes.

Lipid peroxidation, free radical damage to fats, is a crucial step in the development of atherosclerosis and heart disease. Studies show that vitamin C at doses of **1,000 mg** per day lowers levels of oxidative-stress markers in blood, even during the high oxidative-stress period following a meal.[6,13]

Vitamin C and Health

- **Vitamin C was one of the first vitamins to be discovered.**
- **First noted for its ability to fight the connective tissue degeneration of scurvy, vitamin C has now been shown to have a vital relationship with biochemical reactions crucial to cellular health throughout the body.**
- **A new study shows that individuals with higher blood levels of vitamin C are less likely to die from any cause.**
- **Daily supplementation with vitamin C may help prevent cancer, boost the immune system, and protect the cardiovascular system.**

What You Need to Know

Vitamin C has shown many beneficial effects in preventing cardiovascular disease:

- Vitamin C preserved crucial cardiac stem cells, required for **healing damaged heart tissue**, in a lab study.[14]
- Two grams per day of vitamin C fully **restored an important cardiovascular repair system** in smokers after just 2 weeks of supplementation, giving them the same healing capacity as non-smokers.[15]
- A meta-analysis of 44 clinical trials showed that vitamin C supplementation improved endothelial function. The effect was stronger in those with higher cardiovascular risk.[16]
- Vitamin C reduces the tendency to form harmful plaque and clots. A modest **500 mg** per-day dose for 3 months in overweight and obese subjects triggered the release of a natural clot-busting protein, *tissue plasminogen activator* (tPA) in endothelial cells.[17]
- A human double-blind study found that vitamin C supplementation for 6 weeks resulted in a **37% reduction** in the numbers of monocytes sticking to endothelial cells—**reducing the risk that atherosclerotic plaqu**e would form.[18]
- A clinical study of older men showed that a dietary intervention to increase vitamin C levels **slowed the progression in thickening of the carotid artery**.[19]

The overall impact of vitamin C on cardiovascular disease risk is potentially life-saving, and studies suggest that daily supplementation with ample amounts can optimize protection of the heart and major arteries.

Supports Healthy Collagen Production

Collagen, a structural protein abundant in connective tissue and found throughout the body, makes up **30%** of all body protein. Collagen provides strength and durability to bone, skin, tendons, ligaments, blood vessels, and more.[39]

The strength and resilience of much of our collagen decreases with age, contributing to age-related changes to skin, bone, and even our cardiovascular and respiratory systems.[40,41]

Vitamin C plays a critical role in the synthesis of collagen. Studies have consistently shown that vitamin C supplementation improves collagen production and supports healing of tissues following injuries.[39,42-45]

For example, there is evidence that vitamin C may accelerate bone healing after a fracture, and increase the quality and amount of collagen in connective tissues.[42]

Additionally, vitamin C also protects against skin aging and prevents damage caused by ultraviolet radiation.[46,47] In aging mice, it blocked wrinkle formation, loss of elasticity, and thinning of the skin by augmenting production of both collagen and elastic fibers.[47]

Boost Immune Function, Cut Infection Risk

Vitamin C is especially beneficial to the immune system, helping to prevent **viral respiratory infections** like the common cold.[20,21] Immune system cells accumulate vitamin C, using it to create chemical "weapons" which destroy invading bacteria and viruses.[22,23]

Diminished levels of vitamin C leave us vulnerable to specific disease-causing microbes.[21]

Vitamin C's immune-boosting effects arise from multiple mechanisms:[21,22,24-27]

- Promoting the actions of *phagocytes*, the cellular "eating machines" that chew up bacterial and fungal cells.
- Activating T-cells, white blood cells that scan the body for abnormalities and infections and direct both *antibody-producing cells* and *killer cells* to work against viruses and bacteria.
- Mitigating oxidative stress and reducing unneeded inflammatory responses.

In addition, vitamin C slows the gradual shrinkage of the thymus gland in mice.[25] A shrinking thymus is closely associated with *immunosenescence*, in which a declining immune system leaves older people at higher risk for infection and autoimmune disorders.[28]

A meta-analysis of 7 randomized, controlled trials found that, at the onset of an upper respiratory tract infection such as a cold, the addition of doses greater than one gram of vitamin C per day, on top of an ongoing daily preventive vitamin C regimen, significantly shortened the duration of illness and the severity of symptoms.[29]

Bone Health

Large population studies have found that higher vitamin C intake is associated with greater bone mass, and that lower vitamin C intake correlates with bone loss.[30] And clinical studies have shown positive associations between vitamin C supplementation and improved bone mineral density.[31-33]

A **2018** systematic review and meta-analysis found that overall, greater vitamin C intake was associated with a **33%** lower risk of osteoporosis, a lower risk of hip fractures, and greater bone mineral density.[34] This isn't surprising, given that vitamin C is required by enzymes that produce the protein matrix in bones. Thus, vitamin C is required for healthy, strong bones.[31]

The study used mice with genetic defects that make them reliant on dietary vitamin C, as humans are. Multiple bone abnormalities were uncovered when the animals were fed a **C-deficient** diet. However, when vitamin C supplements were given, those abnormalities were resolved.[30,35-37]

Vitamin C has a tremendous impact on bone, including restoring normal development of critical bone-forming cells (*osteoblasts*).[38]

May Help Boost Mood, Fight Depression

Clinical studies are revealing that supplemental vitamin C, alone or in combination with anti-anxiety drugs, improves mood-related disorders.

In a randomized, controlled trial, two weeks of vitamin C treatment reduced anxiety compared to a placebo.[48] In another controlled, clinical trial, 6 weeks of supplementation with vitamin C at a dosage of **1,000 mg** daily significantly reduced anxiety levels.[49]

Another placebo-controlled clinical trial in children with major depression found that with the addition of vitamin C to fluoxetine drug therapy the children had lower depression scores than those who received the fluoxetine plus a placebo.[50] Remarkably, a short-term trial found that a single dose of **1,000 mg** of vitamin C significantly reduced anxiety, compared to baseline levels, among the subjects in the top one-quarter of anxiety scores.[51]

Several mechanisms are being explored to explain vitamin C's mood-improving effects — beyond its ability to combat oxidative stress. One recent animal study showed that vitamin C may activate receptors for the neurotransmitter **GABA**, which boosts mood.[51] Another provided evidence that vitamin C modulates human opioid-like receptors as it exerts its anti-depressant effects.[52]

Summary

Multiple, large studies have shown that individuals with higher blood levels of vitamin C are less likely to die from any cause. Vitamin C has important preventive effects on a range of age-associated disorders.

Studies show that vitamin C supplementation can help prevent many kinds of cancers, protect the heart and blood vessels, boost the immune system and fight immune senescence. It has even shown the ability to help prevent osteoporosis and promote healthy bone formation.

Daily vitamin C supplementation plays a vital role in optimizing our body's ability to combat oxidative stress and protect against many of the diseases associated with aging. ●

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

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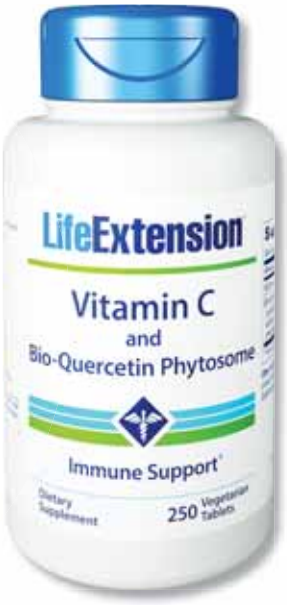

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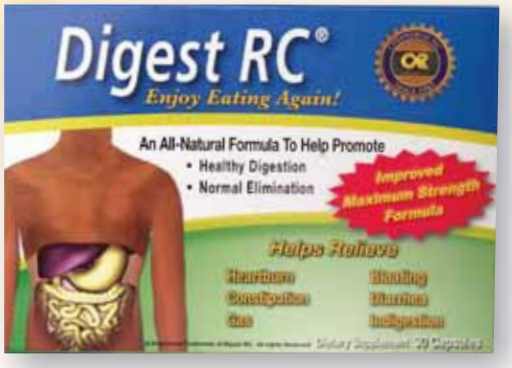

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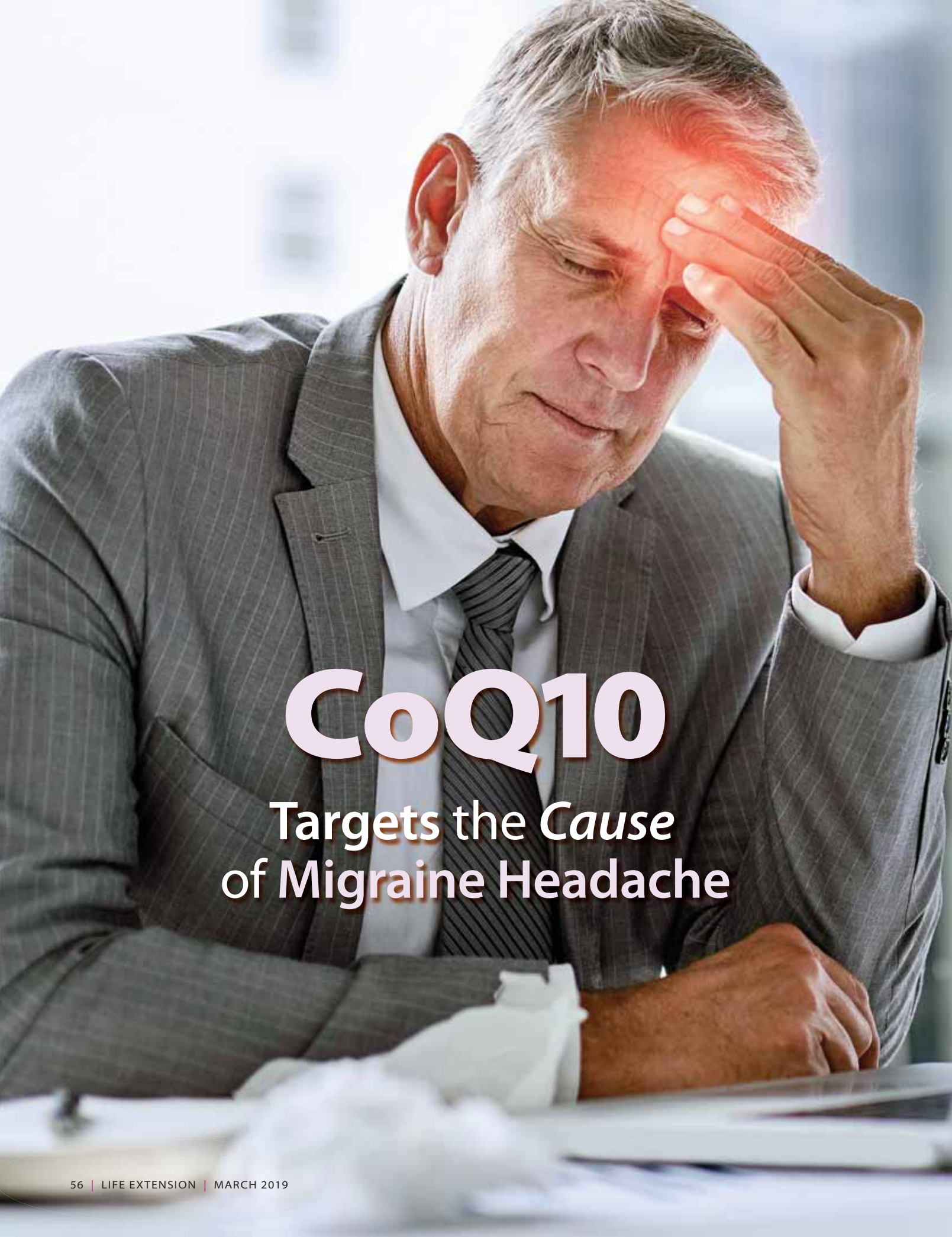
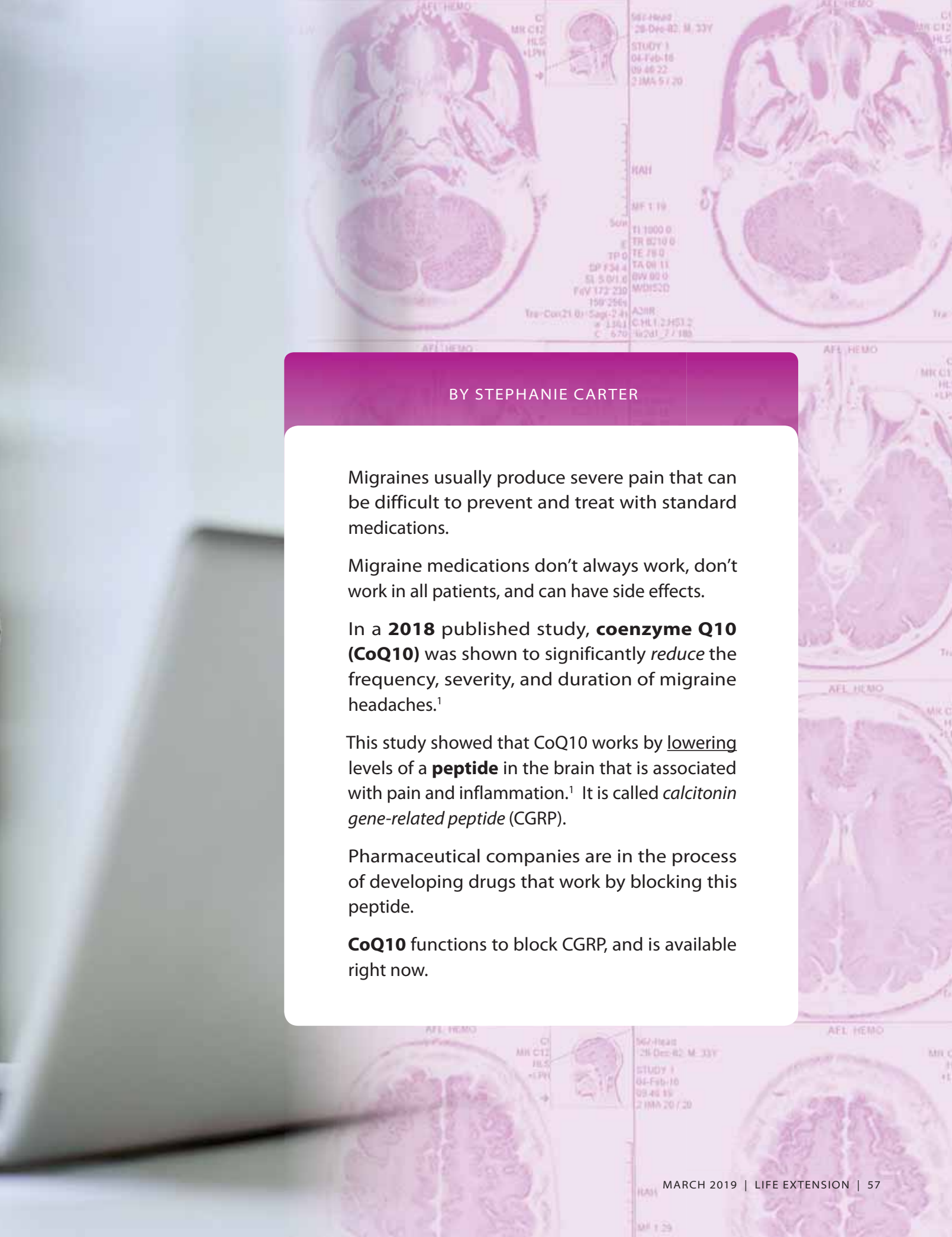


CoQ10

Targets the *Cause* of Migraine Headache



BY STEPHANIE CARTER

Migraines usually produce severe pain that can be difficult to prevent and treat with standard medications.

Migraine medications don't always work, don't work in all patients, and can have side effects.

In a **2018** published study, **coenzyme Q10 (CoQ10)** was shown to significantly *reduce* the frequency, severity, and duration of migraine headaches.[1]

This study showed that CoQ10 works by lowering levels of a **peptide** in the brain that is associated with pain and inflammation.[1] It is called *calcitonin gene-related peptide* (CGRP).

Pharmaceutical companies are in the process of developing drugs that work by blocking this peptide.

CoQ10 functions to block CGRP, and is available right now.

Migraine Prevention

Intrigued by reports that **migraine headaches** and **inflammation** are correlated,[2,3] and by studies showing that CoQ10 has certain **anti-inflammatory** properties,[4,5] researchers began to dig deeper to see if CoQ10 was a possible treatment option for migraines.

About one-third of migraine subjects have a deficiency in CoQ10. And restoring CoQ10 levels to the **normal range** reduces headache frequency and disability.[6]

Human studies have shown that CoQ10 (at doses of **150-300 mg** daily) can help migraine sufferers by:[7-9]

- Preventing migraine occurrence.
- Reducing **number of days** with migraine headache by more than **50%**.
- Reducing monthly **frequency** of headaches by more than **50%**.
- Being effective without any side effects.

The evidence favoring CoQ10's effectiveness and safety is so compelling that, as of 2015, the **Canadian Headache Society** included CoQ10 in its list of compounds receiving a strong recommendation for **migraine prevention**.[10]

More recently, a study released in **2018** confirmed CoQ10's role as a treatment for migraine headaches, and it also revealed important information about *how* it produces such impressive results.

CoQ10 Heals Migraine Pain

For this recent study, premenopausal women with migraines received either **CoQ10** (**400 mg** daily) or a placebo.[1]

After three months, the women taking CoQ10 had significantly ***fewer*** migraine attacks than those receiving the placebo, an indication that CoQ10 can prevent migraines from occurring.

When a migraine did occur, it was ***shorter in duration*** and ***less severe***.[1]

Getting good, clinical pain relief for a migraine is an important advance, considering how challenging the condition is to treat.

This study confirmed previous research about CoQ10's benefits for migraine relief. It also revealed two important mechanisms whose actions are responsible for these benefits.

The ubiquinone form of CoQ10 was used in this study. An enhanced form called **ubiquinol** enables far ***higher*** CoQ10 blood levels, thus enabling a lower dose of ubiquinol. Absorption can be further boosted by taking either form of CoQ10 with a meal that contains fat.

A New Target for Pain Control

At the end of the study showing that CoQ10 has pain-reducing benefits, it was found that the CoQ10-supplemented subjects had lower blood levels of two underlying compounds related to migraines.

One was **TNF-alpha**, a well-known marker of **inflammation**.[1]

This indicates that one way CoQ10 combats migraines is by reducing inflammation. This makes sense, considering that studies have shown a connection between migraines and inflammation.[2,3]

The second compound lowered by CoQ10 is ***calcitonin gene-related peptide*** (CGRP). CGRP is produced in nerve cells, and is now recognized as a key ***mediator*** of pain signals.[1,11,12]

CGRP appears to be intimately connected to migraine headaches and CoQ10 lowers it, along with **TNF-alpha**.

A previous study showed that people who suffer from *occasional* migraines have elevated levels of CGRP in the blood and those with *chronic* migraines have still higher **CGRP** levels.[12]

How CGRP Works in the Brain

Pain is the most common reason people seek medical care, yet there's still a lot we don't understand about it.[13]

Migraine pain in particular is a difficult area in medicine. Available migraine treatments are imperfect: They don't work in all patients, they don't effectively prevent or treat all migraines, and many have undesirable side effects.

At present, it seems that migraines involve at least two factors:

- ***Over-sensitization*** of the brain to otherwise normal stimuli, and
- An ***inflammatory response*** generated within and around the brain itself.[12]

CGRP is released when the sensory nerve endings in the nerves and blood vessels that serve the face are stimulated. Once released, CGRP causes the blood vessels to dilate, including those in the highly pain-sensitive outer membrane covering the brain.[11,12,14]

Like other signaling molecules, CGRP binds to specific receptors in target tissues like blood vessels, which sets off the pain perception cascade.[15]

CGRP is so powerful that, injected intravenously, it provokes migraine attacks in **65%** of people with known migraines.[16]

Fast Relief for Migraine Pain

The exciting news for migraine sufferers is that it's possible to prevent or treat migraine headaches by ***reducing*** or ***inhibiting*** CGRP release or binding to its receptors.

CoQ10 Prevents Migraine Headaches

- **Migraine headaches are a major cause of disability, yet current treatments for preventing or treating the condition are not always effective and come with side effects.**
- **A breakthrough 2018 study showed that CoQ10 supplements significantly reduced migraine frequency, severity, and duration.**
- **CoQ10 accomplished this through significant reductions in blood levels of CGRP, a signaling molecule that originates in nerve endings and triggers pain in tissues surrounding the brain.**
- **Lowering CGRP levels is a potent new way to prevent and treat migraines.**
- **CoQ10 is well-tolerated and, unlike CGRP-targeted drugs, it is available now.**

What You Need to Know

A **2017** meta-analysis pooled data from 13 studies that included more than 6,800 patients. This large review found that strategies that involved blocking, inhibiting, or reducing the production of CGRP were superior to a placebo in three key ways:

- Relieving migraine pain within 2 hours (bringing ***fast*** relief).
- Keeping the pain away for up to 24 hours (bringing ***lasting*** relief).
- Blocking the heightened sensitivity to light and sound that is such a prominent feature of migraines.[17]

These data prompted pharmaceutical companies to develop **CGRP-suppressing** drugs. CoQ10, which works by a similar mechanism, has been available to Americans since 1983.

The Future of Migraine Treatment

Migraine drugs that work by inhibiting **CGRP** are being actively investigated.

These drugs use ***monoclonal antibodies*** to **bind** to **CGRP** or its receptor and prevent their connection. Doing so breaks the CGRP-induced pain cycle.[18]

Four drug companies are close to releasing their own versions of anti-CGRP drugs.[18] These drugs appear to be effective, but they come with some major downsides.

They are costly, must be injected, and can cause unwanted side effects like dry mouth, constipation, nausea, memory loss, numbness, and weight gain.[18,19] Plus, it will be years before they are widely available.

Fortunately, there's no need to await costly and uncertain CGRP-lowering prescription drugs.

CoQ10 safely lowers blood levels of CGRP, and it is available right now.

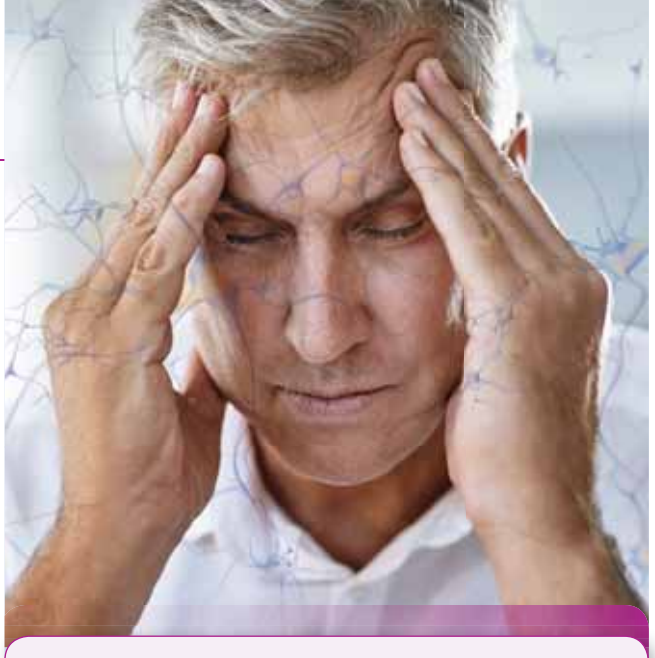
Summary

CoQ10 can help prevent migraine headaches by breaking the cycle of inflammation and neural oversensitization that contributes to their development.

CoQ10 blocks pain transmission by reducing levels of the pain-mediating compound **CGRP**.

A **2018** study showed that CoQ10 reduces headache pain, frequency, and duration.

Migraine sufferers now have another safe, scientific, and affordable option for preventing and treating their pain.



About Migraine Headaches

Migraines are headaches with a neurological basis. We perceive them as debilitating head pain that is usually associated with alterations in sensory perception (such as the classic "aura" that precedes and accompanies migraines).[15,20]

Migraines produce severe pain that can be difficult to successfully prevent and treat. They are recognized in the Global Burden of Disease Study as one of the leading causes of disability and a serious impediment to a good quality of life.[21]

A true migraine headache is more than a "really bad" headache. It is characterized by severe, often one-sided pain, and can be accompanied by nausea and vomiting, and profound sensitivity to light and sound (there can be extreme sensitivity of other senses like smell and touch, as well).[14]

Migraine headaches can be ***episodic***, meaning they develop unpredictably and with variable frequency. ***Chronic*** migraines produce headaches at least 15 days a month, at least **8** of which meet criteria for migraine.[20]

Today's migraine treatment mainstay is the ***triptan*** family of drugs. But these are considered first-line for treating an acute migraine attack, not for preventing one. And they are not useful against chronic migraines.[22,23]

The discovery of **CGRP** and its role in migraine headache production is therefore a breakthrough in migraine science.

And the finding that CoQ10 supplementation suppresses CGRP is a breakthrough in migraine prevention and treatment.

CoQ10's ability to **lower CGRP** levels is an important discovery for migraine sufferers because it reveals a potent new way to prevent and treat the condition.

Doses of **150-400 mg** daily of CoQ10 have been shown to effectively lower CGRP and prevent migraines.

If people choose the more readily absorbable **ubiquinol** form of CoQ10, they can probably reduce this daily dose by half, especially if they take it with a meal that contains some fat. ●

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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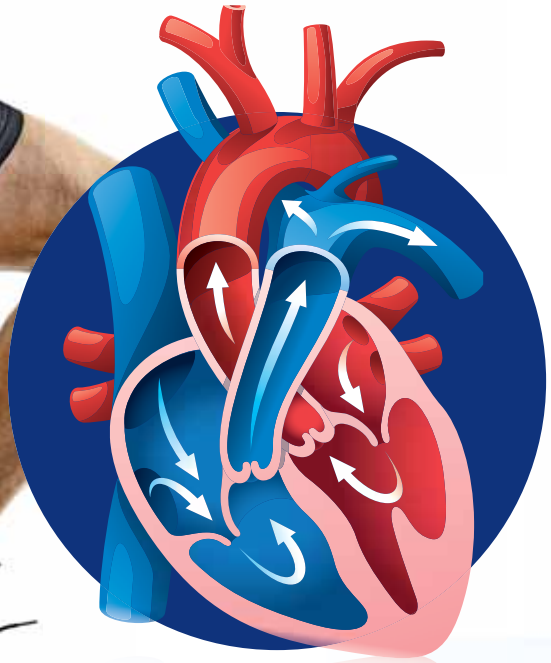

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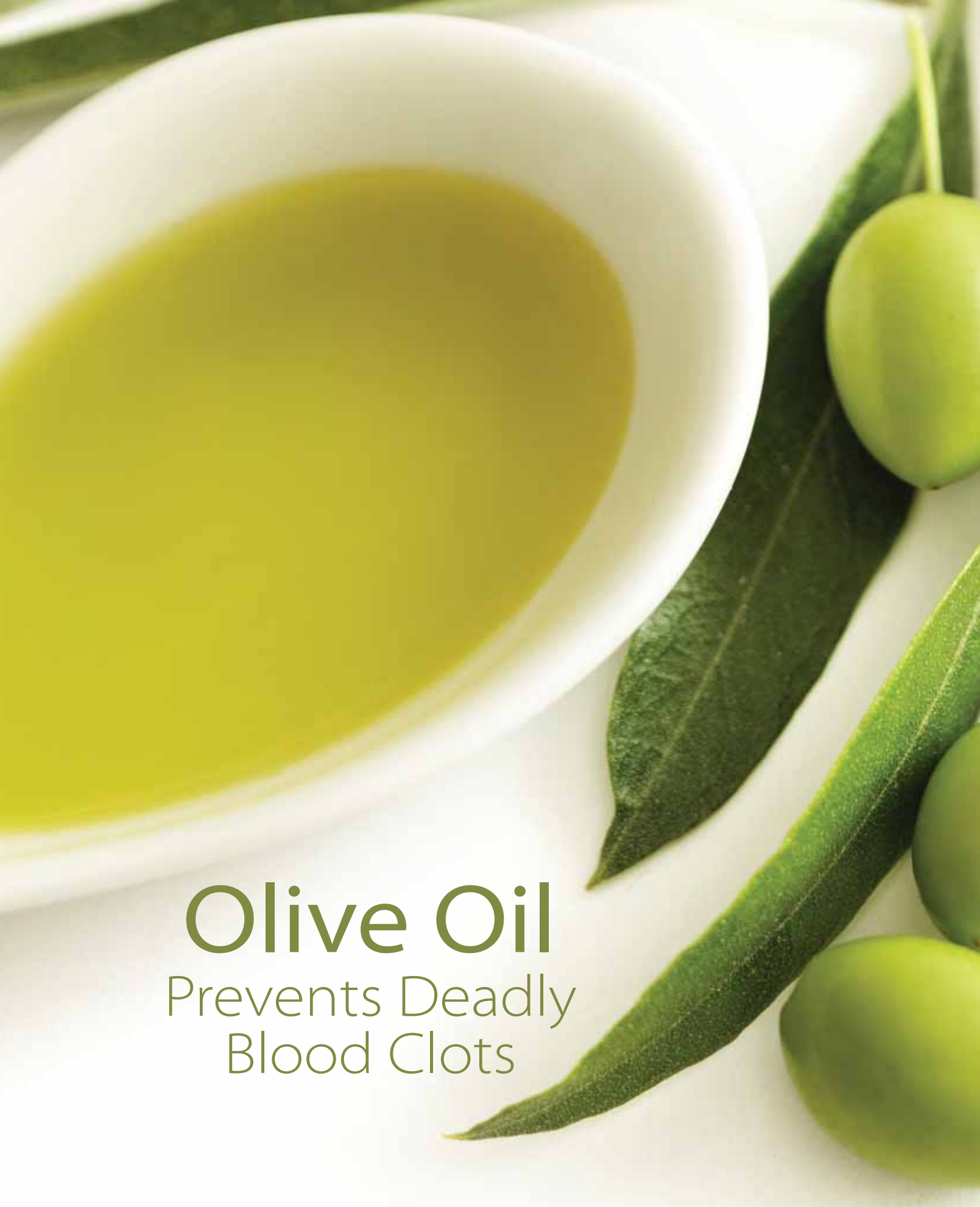
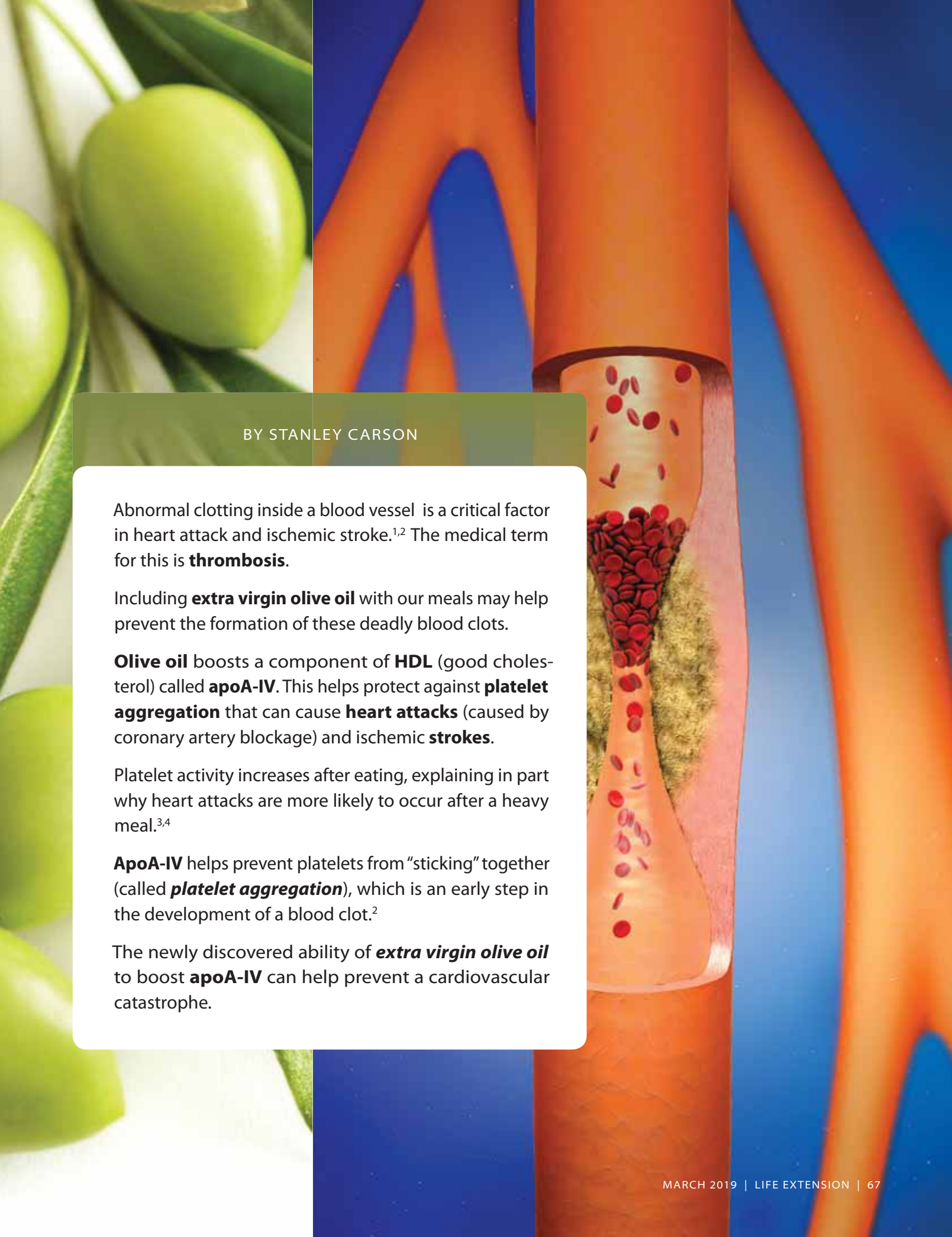


Olive Oil
Prevents Deadly Blood Clots



BY STANLEY CARSON

Abnormal clotting inside a blood vessel is a critical factor in heart attack and ischemic stroke.[1,2] The medical term for this is **thrombosis**.

Including **extra virgin olive oil** with our meals may help prevent the formation of these deadly blood clots.

Olive oil boosts a component of **HDL** (good cholesterol) called **apoA-IV**. This helps protect against **platelet aggregation** that can cause **heart attacks** (caused by coronary artery blockage) and ischemic **strokes**.

Platelet activity increases after eating, explaining in part why heart attacks are more likely to occur after a heavy meal.[3,4]

ApoA-IV helps prevent platelets from "sticking" together (called ***platelet aggregation***), which is an early step in the development of a blood clot.[2]

The newly discovered ability of ***extra virgin olive oil*** to boost **apoA-IV** can help prevent a cardiovascular catastrophe.

A Mediterranean Diet Essential

For some time, the **Mediterranean diet** has been widely recognized as a protective factor against cardiovascular disease and death.[5-8] There are wide variations in this diet, but most sources consider one of the most important components to be high consumption of olive oil, particularly ***extra virgin olive oil***.[9]

Numerous studies have established that people who consume larger amounts of olive oil have a reduced risk of cardiovascular diseases, including **heart attacks** and **strokes**.[10,11]

Extra virgin olive oil contains beneficial *monounsaturated* fats. It is also rich in polyphenols such as *oleuropein*, which protect tissues against oxidative stress while lowering dangerous after-meal glucose levels.[12,13]

However, these effects alone have seemed insufficient to explain the powerful protection offered by extra virgin olive oil consumption, and a fuller explanation has long been sought.

Researchers working at Toronto's **Keenan Research Center** uncovered what may well be a missing link between olive oil and heart health: olive oil may help prevent the formation of a thrombosis, which is a deadly blood clot inside a blood vessel.

An Underlying Cause of Heart Attacks

A blood clot (or a *thrombus*) is a common cause of heart attacks and ischemic strokes.[1,14]

- A heart attack occurs when the clot blocks an artery that supplies blood to the heart, causing the heart muscle to die.
- A stroke can occur when the clot blocks an artery that supplies blood to the brain.

The Protective Role of ApoA-IV

Apolipoprotein A-IV (apoA-IV) is an important component of "good" HDL cholesterol.

Studies have shown an association between apoA-IV levels and cardiovascular disease:

- ApoA-IV levels are lowest in those with blood-clot-related cardiovascular disease
- ApoA-IV levels are highest in those free of such disease[2,15-17]

This suggests that apoA-IV might play a role in preventing the formation of blood clots, but no study had explored this connection.

Researchers from Keenan Research Center were the first to take on that task, and what they found could have a huge impact on how we approach our individual risk for heart disease and strokes, the leading killers of aging adults.[2]

How ApoA-IV Prevents Blood Clots

What the researchers found is that, in laboratory and animal models, apoA-IV prevents **platelets** from clumping together (called ***platelet aggregation***).[2]

This prevents the first step in the formation of a blood clot.

Platelets are best known for forming clots when we bleed, helping to stop blood loss. But they also help stop bleeding inside our arteries when a blood vessel is damaged.

This is beneficial, and even life-saving, in small amounts.

Platelet activity also increases right after we eat. This is one of the primary reasons why heart attacks are likely to occur immediately following a heavy meal, when blood sugar, fat levels, and **inflammation** rise sharply.[18-20]

This recent study showed that apoA-IV helps prevent blood clots from forming by preventing platelets from sticking together.[2]

Additional Findings

The researchers also found that in a lab simulation of blood flow through both large and small vessels, apoA-IV inhibited the growth of an artificially-induced **blood clot**.[2]

And in an experiment using mice that lack the gene for apoA-IV, an artery-blocking blood clot occurred quickly after minor vessel damage. But in mice with intact apoA-IV, little to no blood clot developed, and the vessel remained open.

Researchers determined that human apoA-IV levels are ***lowest*** when platelet aggregation is ***highest***. Specifically, apoA-IV hits bottom and platelet aggregation peaks around 6:00 a.m.[2] This helps explain why serious cardiovascular events peak in the early morning hours.[21-23]

Additionally, this study showed that apoA-IV blunts the acceleration in platelet activity that happens after a meal.[2] This increased platelet activity is another reason why heart attacks are also likely to occur after a heavy meal.[3]

Critical Protection

A study in mice showed that consuming extra virgin olive oil raised levels of **apoA-IV**, compared to a diet rich in palm oil.[24]

Monounsaturated fats such as olive oil have been shown to boost production of **apoA-IV**.[25]

In this way, olive oil exerts a protective action that powerfully counteracts the increases in platelet aggregation that occur after eating.

An impressive mouse study showed that by boosting apoA-IV, extra virgin olive oil decreased lesions of atherosclerosis, reduced plaque size, and reduced the inflammatory responses even when the mice were fed a typical Western diet.[24]

Taken all together, these findings support the idea that extra virgin olive oil is more than a flavorful oil that is used in cooking. Instead, it should be viewed as an important nutraceutical capable of lowering the risk of cardiovascular disease.

Summary

ApoA-IV is an important protective component of good HDL cholesterol.

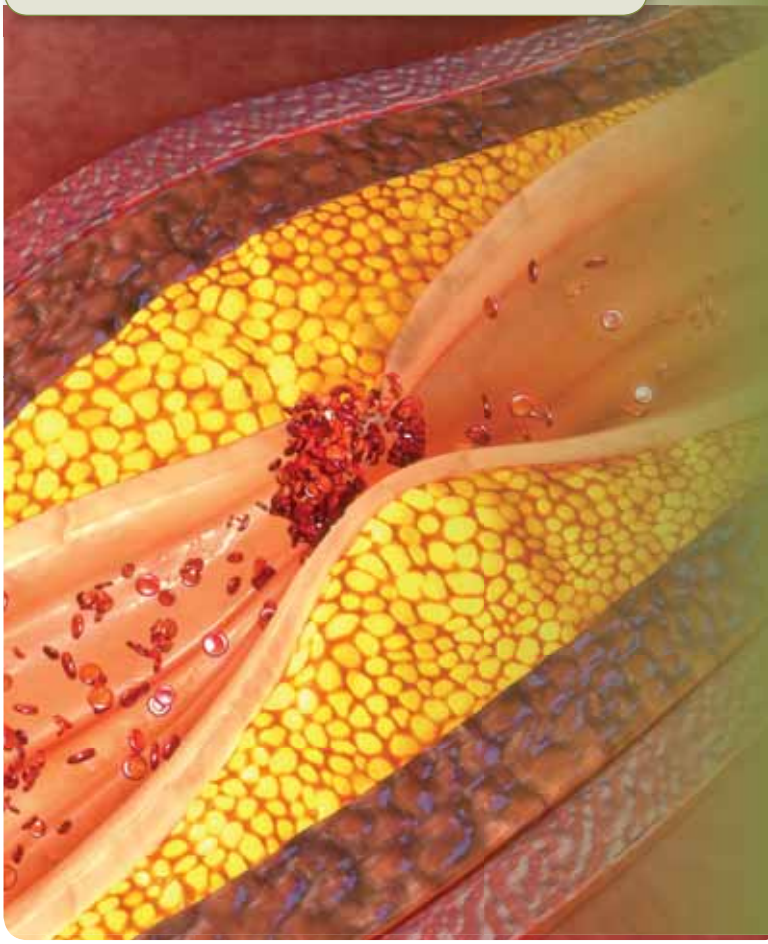
People with higher apoA-IV levels have significantly reduced risk of thrombosis, in which blood clots restrict blood flow and are directly related to heart attacks, strokes, and other cardiovascular catastrophes.

A new study has shown that apoA-IV reduces the tendency for platelets to aggregate, interrupting a crucial step in thrombosis development.

Olive Oil Prevents Blood Clots

What You Need to Know

- **A thrombus (blood clot) is a critically dangerous factor in cardiovascular disease and stroke, the leading causes of death and disability worldwide.**
- **A new preclinical study has shown that a component of HDL, called apoA-IV, sharply reduces blood clotting within arteries.**
- **It does this by preventing platelets from sticking together, which is an important step in the development of a blood clot.**
- **In a series of preclinical experiments, olive oil boosted production of apoA-IV, which may prevent a thrombosis and a resulting heart attack, stroke, or other cardiovascular disaster.**



Monounsaturated fats like extra virgin olive oil elevate apoA-IV levels. This offers critical cardiovascular protection, especially immediately after a meal, when platelet aggregation increases. ●

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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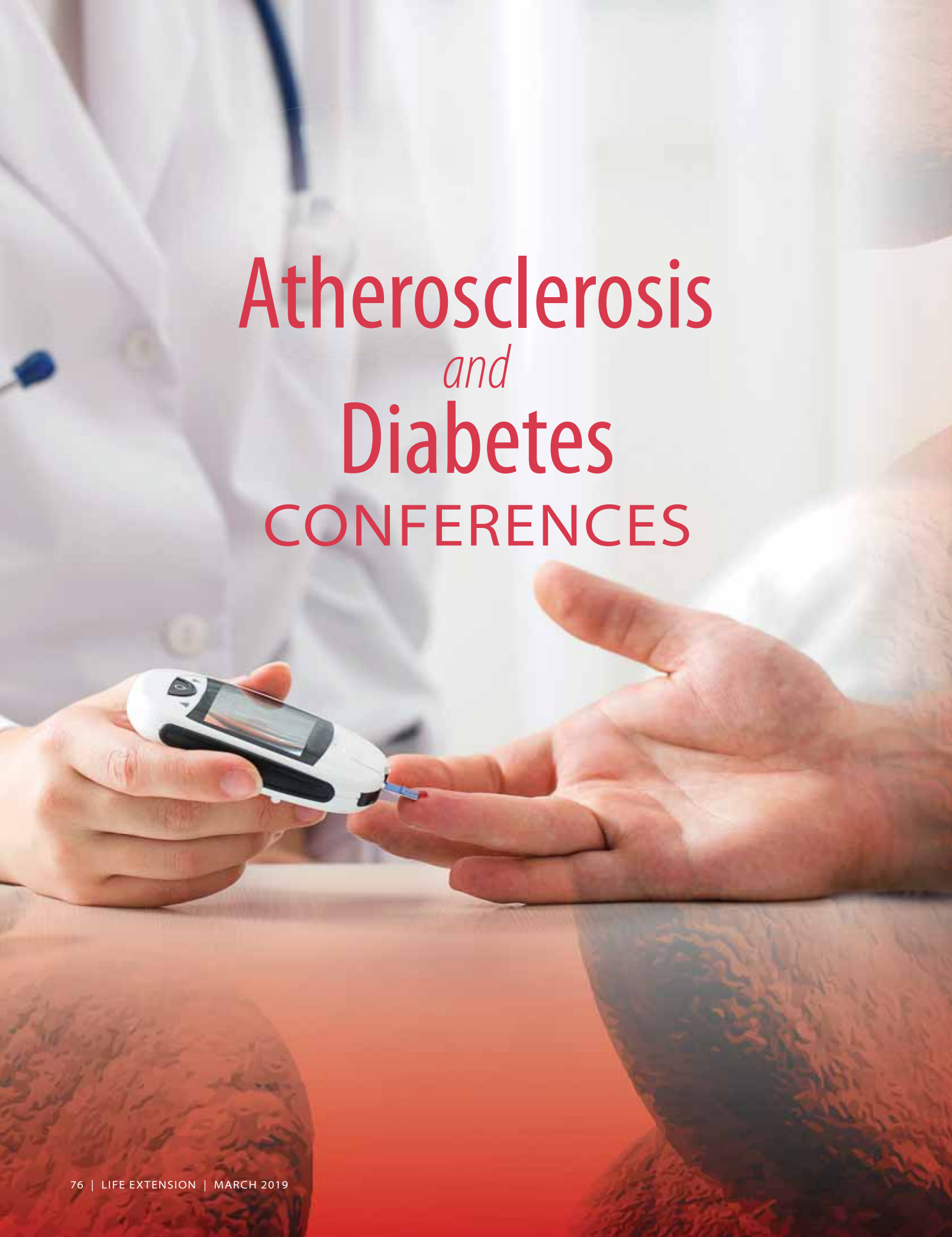


Atherosclerosis *and* Diabetes CONFERENCES

BEN BEST

People with type II diabetes (formerly called adult-onset diabetes) have two to four times the risk of coronary artery disease (a cause of heart attack) and live six to seven years less than people without type II diabetes.[1] **Atherosclerosis** is the buildup of harmful plaque in blood vessels. Approximately **80%** of deaths among diabetic patients are associated with atherosclerosis.[2]

Preceding type II diabetes is a condition called **pre-diabetes**, which is associated with insulin resistance. Some tissues may remain sensitive to insulin when others become insulin resistant. Muscle is the largest insulin-using tissue in the body. In muscular insulin resistance, the islet cells of the pancreas must produce more insulin to enable glucose to enter muscles. Although blood glucose levels remain normal, blood insulin levels are elevated.

Dr. Gerald Reaven originated the concept that insulin resistance is harmful to the cardiovascular system. When the muscles are insulin resistant, the kidneys and nervous system may remain insulin sensitive, thereby raising blood pressure due to increased sodium retention and nervous system activation.[3]

Water and oil (fat) do not mix, so to be carried in the watery blood circulation, fats are attached to proteins (lipoproteins). The two major forms of fat are **triglycerides** (used for energy) and **cholesterol** (used to maintain membrane structure and hormone synthesis).

Dietary fat from the intestine enters the bloodstream as **chylomicron** lipoproteins (which are primarily triglycerides). When chylomicrons are inadequate to supply fat for energy, the liver produces **VLDL** (very low-density lipoprotein) cholesterol from glucose. VLDL contains much more triglyceride than cholesterol. Enzymes (**lipases**) separate triglycerides from chylomicrons and VLDL into free fatty acids that cells can use for energy. But lipases are inhibited by insulin resistance.[4] VLDL from which most triglyceride has been removed becomes **LDL** (low density lipoprotein) cholesterol. LDL cholesterol delivers cholesterol to tissues that have LDL receptors. Incomplete removal of triglycerides results in **remnant cholesterol**.

The liver also produces **HDL** (high density lipoprotein) cholesterol, which can return defective (oxidized or glycated) or excess cholesterol to the liver for destruction.[5] Unlike triglycerides, which are easily eliminated by metabolism, cholesterol is persistent and can be harmful if defective.

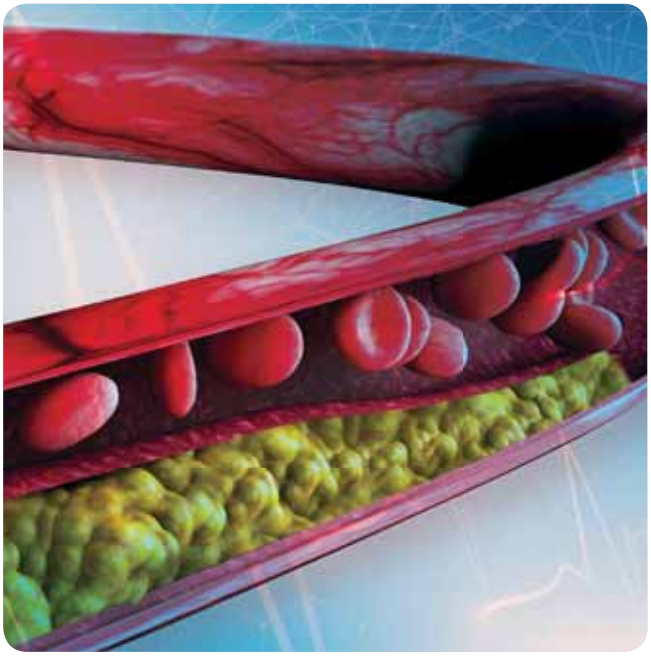
The most common medical practice to reduce atherosclerosis and cardiovascular disease is to prescribe **statin drugs** to reduce LDL cholesterol.[6] More than one fourth of all Americans over age 45 take a statin drug.[7]

This report is primarily based on the 2017 World Congress on Insulin Resistance, Diabetes & Cardiovascular Disease held in Los Angeles and the Keystone Atherosclerosis meeting held in Taos, New Mexico, in 2018.

Blood Vessel Damage by Glucose

Peter Reaven, MD (Professor, College of Medicine, University of Arizona) is concerned with the damage that glucose causes to blood vessels. Impairment of the ability of the delicate lining of blood vessels, known as the endothelium, to dilate and maintain blood flow is called **endothelial dysfunction**. Endothelial dysfunction leads to atherosclerosis.[8,9] Red blood cells have a lifetime of about four months, so the damage glucose does to red blood cells (**glycation**) indicates average blood glucose levels, measured as HbA1C (glycated hemoglobin). The higher the value of HbA1C, the greater the damage.[10] Glucose damages small blood vessels more than large blood vessels.[10] Glycation of small blood vessels leads to blindness and kidney failure, whereas glycation in large blood vessels leads to stroke and heart attack.[11]

Dr. Reaven has shown that a high-fat (**80%**) meal of primarily saturated fat can increase blood glucose due to a temporary increase in insulin resistance.[12] Prior research suggested that saturated fat reduces insulin sensitivity more than polyunsaturated fat (such as fish oil), and that monounsaturated fat (such as olive oil) affects insulin resistance the least.[13] More recent research suggests that insulin resistance only occurs in tissues where fat is being deposited abnormally because fat cells are too overloaded to accept more fat.[14]



Lowering LDL Cholesterol with Drugs

Paul Jellinger, MD (Endocrinologist, Memorial Health Care Network, Fort Lauderdale, Florida) endorses the leading medical strategy for reducing atherosclerosis—that is, by lowering LDL cholesterol. He believes that the average American level of LDL cholesterol of **130 mg/dL** is not healthy. Healthy newborns, native hunter-gatherers, and healthy primates living in the wild have half that level of LDL cholesterol or less.[15]

Statin drugs are the most common means of lowering LDL cholesterol, but more than **40%** of patients taking high doses of statin drugs fail to lower LDL cholesterol below **70 mg/dL**.[16] In a careful analysis of many studies, those who achieved low levels of LDL cholesterol with statin therapy had a **44%–56%** lower risk of a major cardiovascular event.[16] Adding ezetimibe (a non-statin drug that reduces absorption of dietary cholesterol from the intestine) to statin therapy reduces cardiovascular disease risk.[17] Adding the non-statin Repatha® (evolocumab), a PCSK9 inhibitor, to statin therapy also reduces atherosclerotic plaque volume more than statin therapy alone.[18] The original cost of Repatha was $14,000 a year. The price was recently reduced to around $5,900 a year. Since most insurance plans won't cover it, Repatha is cost-prohibitive for most people.

Gene Therapy to Lower LDL Cholesterol

Kiran Musunuru, MD, PhD, MPH (Associate Professor, Perelman School of Medicine, University of Pennsylvania) is interested in using gene therapy to reduce LDL cholesterol. People with a hereditary PCSK9 defect have approximately **30%-40%** lower levels of LDL cholesterol and an **88%** reduction in coronary artery disease risk.[19] Dr. Musunuru has used CRISPR-Cas9 gene editing and gene therapy to disrupt PCSK9 and reduce blood cholesterol in normal laboratory mice.[19]

Angiopoietin-like proteins (**ANGPTL**s) inhibit the enzymes (lipases) that break-up triglyceride fats.[20] Humans who have inherited genetic mutations that result in lower levels of the ANGPTL3 form of ANGPTL have been shown to have less triglyceride

and LDL cholesterol in their blood, as well as an approximate one-third reduction in odds of coronary artery disease.[21] Use of an antibody against ANGPTL3 in healthy human volunteers with elevated triglycerides and LDL cholesterol has been shown to lower the LDL cholesterol as much as **23%**.[22] Dr. Musunuru wants to use gene therapy to reduce ANGPTL3 as well as PCSK9 in humans.

Remnant Cholesterol as Cardiovascular Disease Risk

Anne Tybjaerg-Hansen, MD, DMSc (Clinical Professor, University of Copenhagen, Denmark) is concerned about the role of remnant cholesterol in the development of atherosclerosis. **Remnant cholesterol** is a term for all cholesterol-containing particles exclusive of HDL and LDL cholesterol. Remnant cholesterol causes more atherosclerosis than LDL cholesterol.


Tybjaerg-Hansen

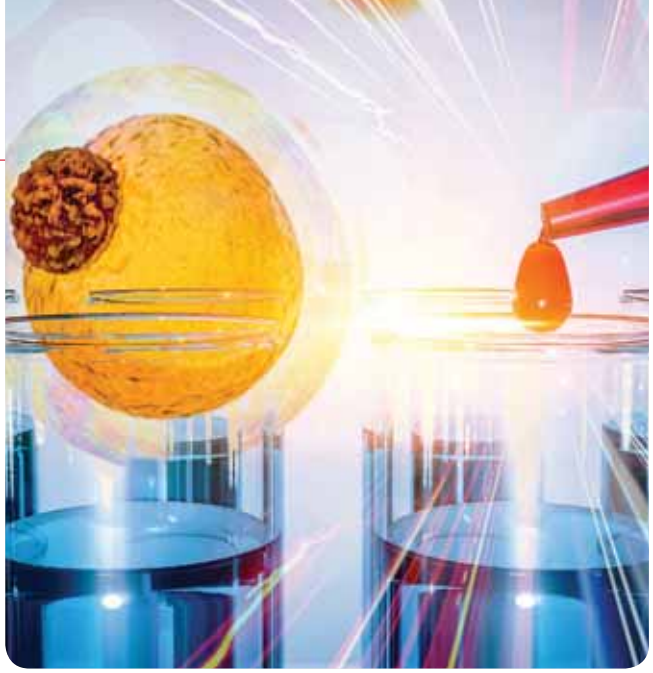
Remnant cholesterol contains about **40 times** more cholesterol than LDL cholesterol,[23] and is associated with chronic inflammation.[24] Every increment of elevated remnant cholesterol increases the risk of heart attack.[25] The extent to which blood triglycerides (fats) rise after a meal corresponds with elevated remnant cholesterol and cardiovascular disease.[26,27]

Reducing Inflammation to Reduce Cardiovascular Disease

Paul Ridker, M.D. (Professor of Medicine, Harvard University, Boston, Massachusetts) led an important clinical trial aimed at reducing cardiovascular disease death by reducing inflammation. Although oxidized LDL cholesterol may induce atherosclerosis, high levels of LDL cholesterol have the capacity to form crystals, which leads to inflammation.[28] **Cholesterol crystals** are typically found in atherosclerotic plaque, not only causing inflammation, but also inducing plaque rupture.[29]


Ridker

Patients benefit the most from statin therapy when both LDL cholesterol and inflammation are reduced.[30] Dr. Ridker's clinical trial showed that treating patients with an antibody against the inflammatory cytokine interleukin 1-beta (IL-1B) substantially reduced the incidence of heart attack and stroke.[31] But the treated patients suffered more deaths from infection; consequently there was no difference in the death rate between the treated and untreated patients.[31]



Insulin Resistance Indicates Cardiovascular Disease Risk

Nadir Ali, MD (Cardiologist, Clear Lake Regional Medical Center, Webster, Texas) believes that insulin resistance is a better indicator of cardiovascular disease risk than LDL cholesterol.[32] Insulin resistance leads to endothelial dysfunction, which leads to atherosclerosis.[33]


Ali

A study of more than 100,000 healthy individuals showed insulin resistance to be highly predictive of cardiovascular disease, but levels of LDL cholesterol were not predictive.[34] Another study divided 208 healthy people into three groups based on levels of insulin resistance. After an average of 6.3 years, not a single age-related disease was seen in the third with the least insulin resistance, whereas **18%** of the group in the highest third developed at least one incidence of stroke, cancer, high blood pressure, coronary heart disease, or type II diabetes.[35]

Insulin resistance before the onset of diabetes typically results in normal blood glucose levels because the pancreas compensates by secreting more insulin. But insulin resistance is not the same in all tissues. Insulin is a hormone that promotes growth, so high blood levels of insulin may worsen atherosclerosis.[36]

In Japan and Norway, death from cardiovascular disease is lower in women with high cholesterol, compared to men.[37] LDL cholesterol reduces death from infectious disease because LDL cholesterol adheres to bacteria and viruses, reducing their toxicity.[37]

TMAO Causes Atherosclerosis

Michael Petriello, PhD (Fellow, University of Kentucky College of Medicine) is interested in organic pollutants and the role of **TMAO** (trimethylamine N-oxide) in cardiovascular disease. TMAO is associated with the unpleasant odor of decomposing dead fish. Elevated levels of TMAO in humans contribute to atherosclerosis. Intestinal microbiota produce TMAO from foods such as eggs, liver, beef, and pork.[38] Vegans and vegetarians typically do not have these microbiota and do not produce TMAO when fed red meat experimentally.[39] Dr. Petriello has shown that dioxin-like organic pollutants PCBs (polychlorinated biphenyls) can substantially increase TMAO formation in the liver.[40]

Industrial PCB production was banned in the U.S. in 1979,[41] but PCBs resist degradation, thereby persisting in the environment and accumulating in the fat of humans and animals (notably in the fat of animals eaten by humans, amplifying the effect in humans).[42] Persistent organic pollutants (including DDT, which was banned in the U.S. in 1972)[43] and phthalates (which can leech from plastic containers) accumulate in fat tissue, disrupting hormone function and increasing obesity.[44] Nitrates in processed meats (sausages, salami, bacon) cause endothelial dysfunction, insulin resistance, and atherosclerosis.[45] Red meat increases the risk of ischemic stroke.[45]

Dr. Petriello advocates a vegetarian diet and notes that green tea can inhibit intestinal absorption of dietary lipids and increase the excretion of PCBs.[46]

Insulin Resistance in the Liver

Sudha Biddinger, MD, PhD (Assistant Professor of Pediatrics, Harvard Medical School, Boston, Massachusetts) uses mice as experimental models to understand atherosclerosis and diabetes. Insulin resistance can affect many different organs and tissues to different degrees and with different effects.[47] Dr. Biddinger has genetically modified mice so they are insulin resistant in the liver, but not in other tissues. These mice developed severe atherosclerosis within three months, whereas normal mice do not.[47,48] In a follow-up experiment, she showed that these mice exhibit reduced cholesterol synthesis, demonstrating that a key effect of insulin on the liver is to increase cholesterol synthesis.[49] Statins inhibit the cholesterol synthesizing enzyme in the liver.[50]

Dr. Biddinger has also shown that the enzyme which produces the pro-atherogenic substance TMAO in the liver is inhibited by insulin, but that the enzyme is increased in insulin resistance.[51]

Two Signs of Pre-diabetes

Foo Siew Hui, MD (Endocrinologist, Hospital Selayang, Selagor, Malaysia) is interested in prediabetes. Roughly a quarter of people with signs of prediabetes progress to type II diabetes within three to five years.[52] Only **3.4%** of prediabetic patients report that their physicians informed them of having prediabetes, either because the physicians did not diagnose the prediabetes or because of the poor memory of the prediabetic patients.[53]

There are two somewhat distinct signs of prediabetes: (1) In **impaired fasting glucose**, a person who has fasted eight hours will show abnormally high blood glucose (**100** to **125 mg/dL**), and (2) In **impaired glucose tolerance**, a person who has been administered a standard quantity of glucose (**75 grams**) will show elevated blood glucose (**140** to **199 mg/dL**) when tested in two hours.[53] Although some people with prediabetes have both signs, most do not. Nearly four times as many people with prediabetes have impaired glucose tolerance rather than impaired fasting glucose.[53]

People with only impaired glucose tolerance have skeletal muscle insulin resistance, whereas people with isolated impaired fasting glucose have insulin resistance in the liver.[54] Some people with metabolic abnormalities have both of these conditions.[55] Physical inactivity and poor diet have been found to be associated with impaired glucose tolerance, whereas smoking has been found to be associated with impaired fasting glucose.[56]

Fructose, Uric Acid, and Metabolic Syndrome

Richard Johnson, MD (Professor of Medicine, University of Colorado) has linked the development of metabolic syndrome and obesity due to the sugar fructose to the elevation of uric acid by fructose.[57] (Table sugar is composed of equal parts glucose and fructose). Uric acid causes endothelial dysfunction and insulin resistance. Consumption of sugar averaged four pounds per year in England in 1700, which is far less than the 150 pounds per person of sugar and high fructose corn syrup now consumed annually in the U.S.[58] Dr. Johnson's team has shown that fructose induces obesity by causing resistance to the hunger-suppressing hormone leptin.[59] His team was able to induce metabolic syndrome in overweight, healthy men in only two weeks by administering fructose.[60] His team showed that fructose causes fat to accumulate in the liver, linking fructose to non-alcoholic fatty liver disease (NAFLD), a condition affecting **20%-30%** of adults in the U.S.[61]

His team has also shown that, in mice, high salt consumption increases fructose production, leading to obesity, insulin resistance, and fatty liver.[62]

Concluding Remarks

Most medical professionals are intent on lowering LDL cholesterol as much as possible to prevent atherosclerosis despite the fact that cholesterol is a component of all cell membranes and is required to synthesize many hormones. Nearly one fourth of cholesterol in the body is in the brain, where it is required for mental function.[63,64] Notably, cholesterol is an essential component of myelin (facilitating communication between brain cells), and cholesterol is required for synaptic plasticity (required for learning).[65]

Clinical trials showing the cardiovascular benefits of cholesterol-lowering drugs do not distinguish between lowering oxidized cholesterol or non-oxidized cholesterol. People with oxidized LDL cholesterol may benefit while others do not.

People with small, dense LDL cholesterol have much more atherosclerosis than those with large LDL cholesterol.[66] Small, dense LDL cholesterol is more easily oxidized and glycated, and a high-carbohydrate diet has been shown to specifically increase small, dense LDL cholesterol.[67] Insulin resistance promotes small, dense LDL particle formation.[68]

Many studies show that oxidized LDL cholesterol leads to atherosclerosis.[69,70] But many scientists do not believe that oxidized LDL causes atherosclerosis because of poorly designed clinical trials in which antioxidants failed to reduce cardiovascular disease.[71] A notable example is the failure of alpha-tocopherol to reduce cardiovascular disease in a clinical trial based on ignorance of the fact that gamma-tocopherol is more important than alpha-tocopherol for reducing atherosclerotic oxidation and that alpha-tocopherol supplementation displaces gamma-tocopherol.[72] A less publicized study showed that N-acetylcysteine reduces cardiovascular disease.[73]

High LDL cholesterol blood levels are widely regarded as indicating a risk factor for atherosclerosis, but coronary artery calcium directly measures atherosclerosis.[74] Whether or not blood LDL cholesterol is elevated, people shown not to have coronary artery calcium may not need to be taking statins.[75]

Not discussed directly in this article is a protein on the surface of **LDL** called **apolipoprotein B**. Higher levels of **apolipoprotein B** (more than **80 mg/dL**) pose a greater atherosclerosis risk than elevated LDL cholesterol itself.

Those who have an annual **Male** or **Female Blood Test** panel offered by **Life Extension** learn their **apolipoprotein B** status and can take corrective actions to lower it. More about **apolipoprotein B** and the many ways to reduce it will soon be published in this magazine. ●

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

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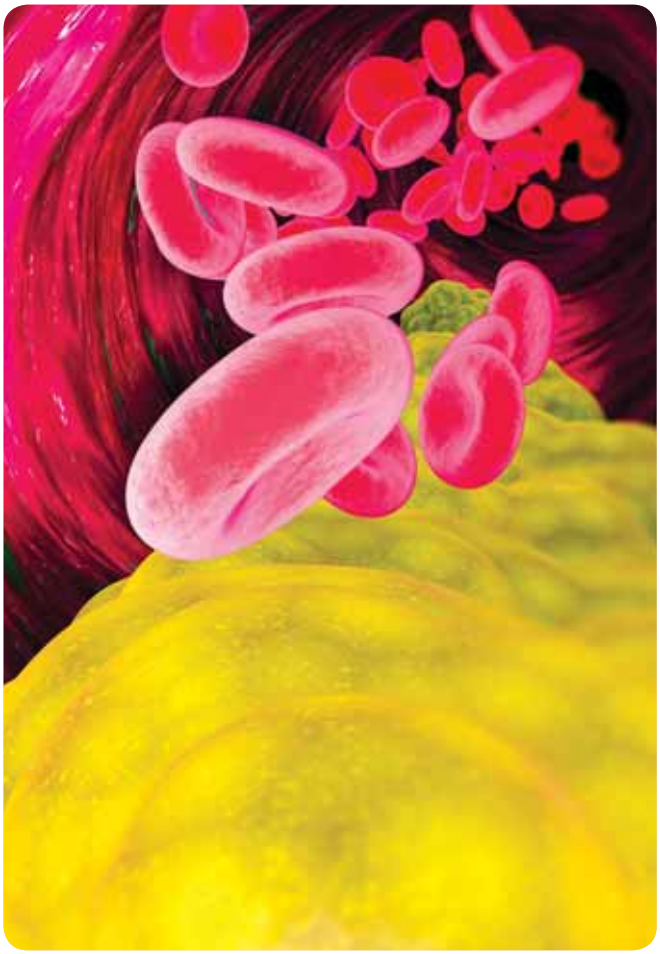

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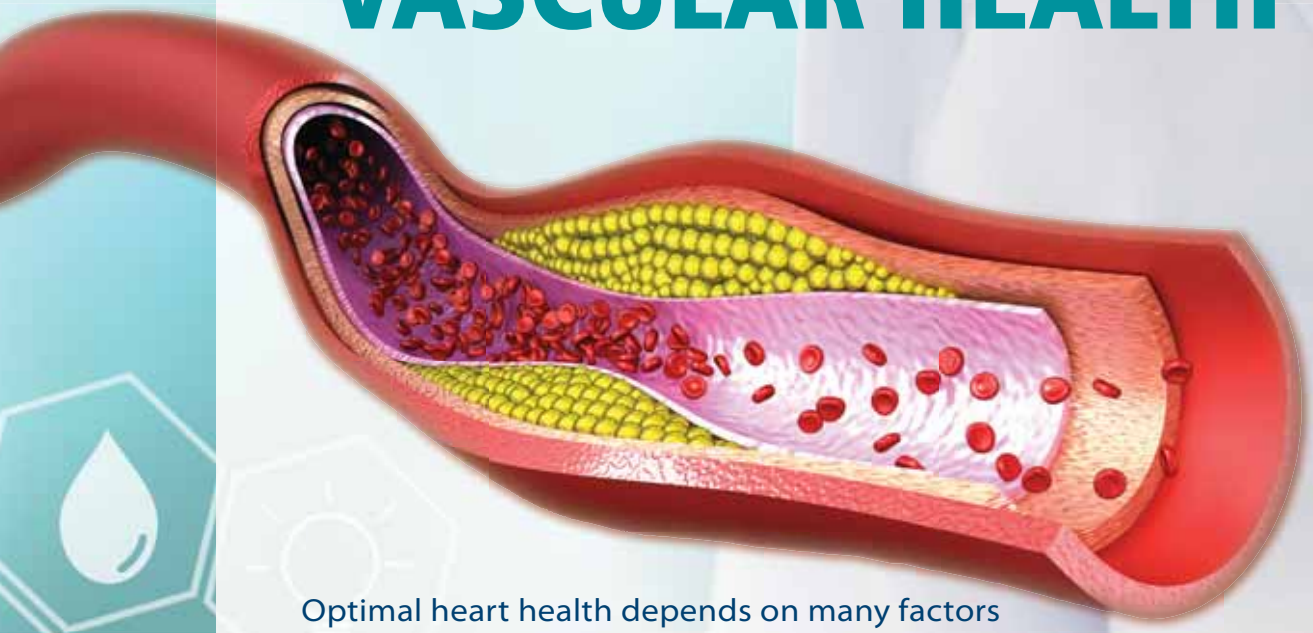

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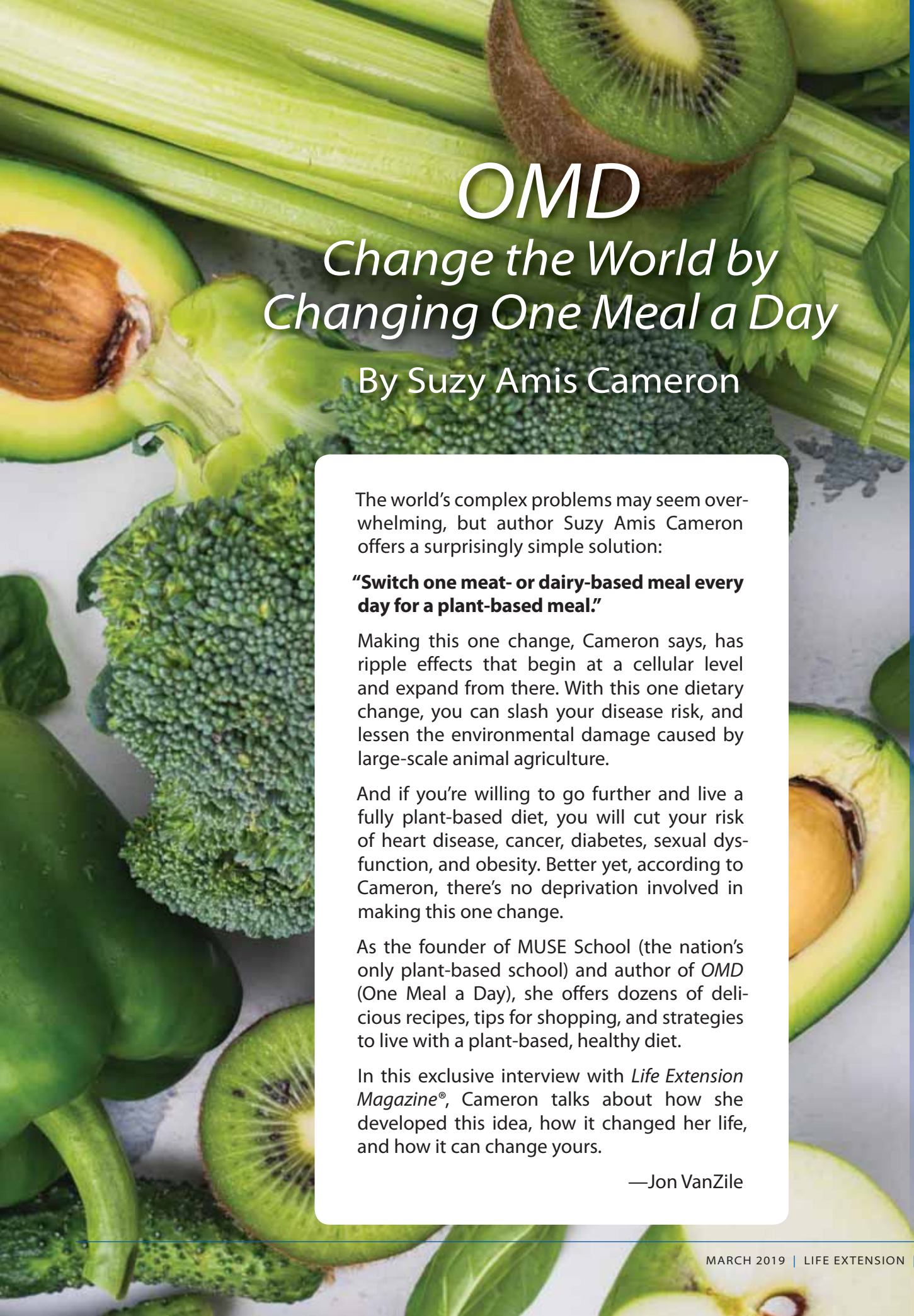

OMD
Change the World by Changing One Meal a Day

By Suzy Amis Cameron

The world's complex problems may seem overwhelming, but author Suzy Amis Cameron offers a surprisingly simple solution:

"Switch one meat- or dairy-based meal every day for a plant-based meal."

Making this one change, Cameron says, has ripple effects that begin at a cellular level and expand from there. With this one dietary change, you can slash your disease risk, and lessen the environmental damage caused by large-scale animal agriculture.

And if you're willing to go further and live a fully plant-based diet, you will cut your risk of heart disease, cancer, diabetes, sexual dysfunction, and obesity. Better yet, according to Cameron, there's no deprivation involved in making this one change.

As the founder of MUSE School (the nation's only plant-based school) and author of *OMD* (One Meal a Day), she offers dozens of delicious recipes, tips for shopping, and strategies to live with a plant-based, healthy diet.

In this exclusive interview with *Life Extension Magazine*®, Cameron talks about how she developed this idea, how it changed her life, and how it can change yours.

—Jon VanZile

LE: How did you develop OMD?

SAC: I got into organic, whole foods after I had my son, Jasper, to give him the healthiest diet possible, but I was still eating meat and dairy products. Then, when he was six, I met my second husband, Jim Cameron. We started out on opposite ends of the food spectrum. I'd go to his house and stand in front of his pantry and stare at the cans of meat chili and sardines and say to myself, "There is not one thing I can bring myself to eat here." After we got married, I slowly shifted the composition to an organic pantry. So by the spring of 2012, I thought we were doing really well on the food front—our family ate organic, grass-fed beef, free-range chicken, omega-3-packed eggs and a ton of vegetables. But at the same time, I had just turned 50, and Jim was heading toward 60. We were starting to see some of our siblings and friends develop health concerns. I began wondering if we were next.

One day I was heading to the gym and I picked up a DVD of the documentary *Forks Over Knives*. Ten minutes later, I had to get off the treadmill and just sit down and watch the film. I felt like my entire world was falling apart. I felt betrayed. The film is a documentary based on the works of Dr. T. Colin Campbell, a nutritional biochemist from Cornell University, and Dr. Caldwell Esselstyn, a former surgeon at the Cleveland Clinic. It traces the experiences of a group of people who used plant-based eating to reverse degenerative disease. Watching that film, I felt like I had been lied to my whole life. I knew I had to have Jim watch it with me. The very next day, I sat there and watched him as he watched it, but he didn't say a word. The second the film ended, he stood up, walked right out of the room, and by the time we got to the kitchen, he said, "We can't have any animal products in our house anymore." Twenty-four hours later, we had cleared everything out.

The idea for OMD itself came from my school, MUSE. We brought the idea of a plant-based diet to our school and transitioned the whole school. But because it was a school, we started with just lunch and had a series of talks to reassure parents it was just that one meal a day. Still, many heels were dug in. They were worried their kids weren't getting enough protein. Then one day, my sister and co-founder Rebecca's husband, Jeff King, who is head of the school, said, "OMG, people, it's just OMD." And OMD, one meal a day, was born.

Suzy Amis Cameron

LE: The film *Forks Over Knives* must have made quite an impression! What was it that really got your attention?

SAC: After we cleaned out our house, we gobbled up as much information as we could. I found out that the gorgeous glow people always talk about is because plant-based eaters literally age more slowly, on a cellular level. Plant-based eating increases the body's own antiaging activity by raising levels of telomerase, the enzyme that makes it possible for our genes to repair themselves. Plant-based bodies have less inflammation. In fact, for every extra **3%** of plant protein we eat, we cut our risk of death by **10%**. Overall, plant-based people live longer, have a **24%** lower risk of developing heart disease, a **25%** lower risk of developing diabetes, a **43%** lower risk of developing cancer, and a **57%** lower risk of developing Alzheimer's disease or dementia. Six years after we started living a plant-based lifestyle, we're both healthier than we've ever been. Almost no illness. Jim has lost 30-plus pounds and can work out harder and longer than ever. He has aged in reverse. For myself, I find that I can work out harder than ever and my recovery is better than ever. I'm in better shape now than I was in my 20s.

LE: Between your own home and your school, you've had the opportunity to convert many people to a plant-based diet. What are some of the things you've seen along the way?

SAC: We have kids cutting down on allergy medications. Kids dropping pounds and getting active. Kids who have been on medication for ADD and ADHD feeling calmer and more focused, even able to get off their meds completely. We saw the same transition happen among staff members. The assistant head of the school, 40 pounds gone, ditched his medications; PR manager, 30 pounds. These days, rather than resistance and pushback, we have families who seek us out because we are plant-based. Parents want to have their children on a dye-free, toxin-free, pesticide-free campus, and they want to know where the food their children are eating is coming from.

LE: It's safe to say that most people have been raised with the idea that eating animal products, especially meat, is necessary for health. How could we have gotten this so wrong?

SAC: Let's be clear: our current diet isn't the historical norm. For all but the last 70 years, today's average American diet—high in saturated fat, sugar, and refined foods and low in fiber—would have been an unaffordable luxury for most humans. We now consume a whopping 180 pounds of meat per person per year. We eat like bloated, overindulgent kings and queens at every meal. And as a result, we're staggering under the burden of diseases like gout, heart disease, hypertension, type II diabetes, and obesity. For the first time in history, we are seeing a generation of children who will have a shorter life expectancy than their parents. By contrast, whole-food, plant-based diets have been linked to better weight management, reduced blood sugar, reduced risk of cancer, lower cholesterol, reduced blood pressure, reduced obesity, reduced risk of heart attack, and lower overall mortality, less need for medication, and reversal of coronary artery disease and type II diabetes. Plant-based eating also increases our virility, improving our sex lives.

LE: Let's talk specifically about heart disease, the leading killer of both men and women. How can switching to a plant-based diet help the heart?

SAC: When we eat too much animal fat, we raise the level of dangerous LDL cholesterol in our blood. Those LDL molecules burrow into the tiny gaps between the endothelial cells in our arteries. This disruption triggers our immune system to release inflammatory macrophage cells that suck up all that LDL, oxidizing it into stiff globs of plaque. If we keep eating lots of saturated fats from animal products, those globs get bigger and bigger, eventually slowing blood flow. Now consider this: just a single meal of animal products can spike inflammation and cause your arteries to stiffen.

On the flip side, the more vegetables we eat, the higher our blood levels of powerful plant chemicals called polyphenols that lower the risk of heart disease. The Nurses' Health Study, one of the largest and longest epidemiological studies in U.S. history, found that those who ate the most fruits and vegetables had the lowest rates of cardiovascular disease. Indeed, every extra serving of leafy greens they ate a day decreased their risk by **11%.** With OMD, you're increasing the amount of vegetables in your diet, but you don't have to give up your favorite foods.

LE: In your book, you write about how going to a plant-based diet can improve sex lives, especially for men. Tell us a little more about that.

SAC: We know that erectile dysfunction is one of the classic early warning signs of clogged arteries. Men who have heart disease and diabetes—which are both associated with heavy meat and dairy consumption—have much higher rates of erectile dysfunction. A guy in his forties who's having trouble getting an erection has a **50-fold** increased chance of a cardiac event—that's a **5,000%** greater risk! And a whopping **40%** of men over age **40** suffer from erectile dysfunction. Here's something a lot of guys just haven't caught onto yet: plant-based eating is the new Viagra! Going green is studly. And it's not just men. Women with arterial plaque also have significantly decreased arousal and ability to orgasm.

LE: One of the threads that runs through the stories in your book is consistent weight loss after going plant-based. How does switching to a plant-based diet help someone lose weight?

SAC: If weight loss was your only metric, of all the possible "weight-loss" diets out there, plant-based eating appears to top every single one. In a study of over 70,000 people published in the *Journal of the Academy of Nutrition and Dietetics*, researchers examined the eating patterns of five groups: meat eaters, semi-vegetarians, vegetarians who eat fish only, vegetarians who consume dairy, and vegans. Surprise: vegans had the lowest average BMI, while meat eaters had the highest. They had a whopping **33%** obesity rate, while vegans had a rate of only **9.4%**. In fact, the obesity rate seems directly proportional to the amount of animal products in a person's diet. And that's not even the best part! The best part about losing weight by going plant-based is the total, utter simplicity of it. There's no calorie counting, no nutrient ratios. Just switching to a whole-food, plant-based diet will automatically give you more fiber, antioxidants, vitamins, and minerals, and a whole lot less fat.

LE: What's the best way people can make this type of change in their lives?

SAC: It's easy. Remember: it's just one meal a day. OMD. Start small, start right where you are, and plan your first meal. Don't overthink it! ●

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

Adapted from *OMD: Change the World by Changing One Meal a Day*, by Suzy Amis Cameron

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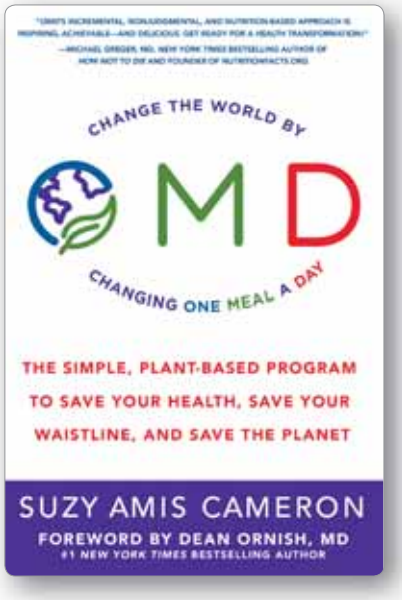

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Parsley

Native to the Mediterranean region, parsley is a culinary herb cultivated around the world. Although parsley is often regarded only as a garnish or topping to add color and fresh flavor to dishes, it is, in fact, a nutritional powerhouse. Include parsley in your daily diet whenever possible to benefit from its rich nutritional compounds.

Parsley is also a rich source of **flavonoid** compounds and other nutrients that have potent **anti-mutagenic** and **anti-inflammatory** properties. Compounds found in parsley in small amounts such as **apigenin**, **eugenol**, and **myricetin** are being actively studied as options for treatment or prevention of various conditions.

Arthritis and Inflammation

Several compounds in parsley have been shown to reduce inflammation. This effect can help guard against and reduce the symptoms of many chronic, age-related diseases.

For example, **eugenol** has been studied in animal models of arthritis.[1,2] In these studies, treatment with this component of parsley reversed the redness and swelling around joints. At the same time, the inflammatory cells and compounds that normally accompany arthritis were reduced in the involved joints.

Diabetes

Diet plays an important role in the control of type II diabetes and parsley can provide a powerful aid. Myricetin, found in parsley, reduces insulin resistance.[3,4] Not only does it help the body respond better to its own insulin, but it mimics the action of insulin, improving glucose and fat metabolism.

Anticancer Effects

Many compounds found in parsley have demonstrated the ability to prevent and/or treat various forms of cancer.[5-7]

High-heat grilling of meats can create cancer-causing chemicals called **heterocyclic amines**. Parsley has been found to block these and other dangerous compounds, preventing the damage to DNA that can lead to cancer.[8]

Compounds in parsley may help treat existing tumors. In an animal model, apigenin stopped the growth of aggressive human breast cancer tumors, even inducing cell death of the cancer cells.[9]

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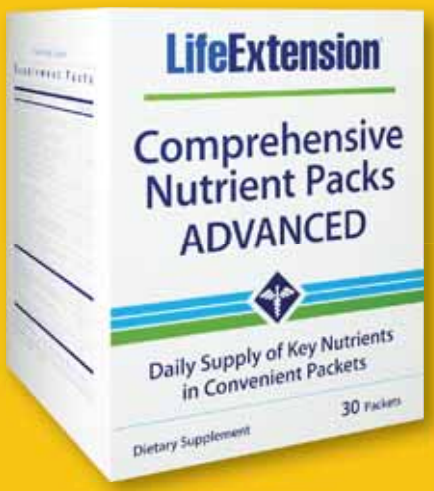

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Dog Aging Project Taps Rapamycin for Longevity

BY GARY GREENBERG

Man's best friend is now the focus of the **Dog Aging Project**, a comprehensive study that is examining virtually every factor of canine longevity.

Researchers believe many of the findings will be relevant to human aging, including intervention with the drug **rapamycin**.

"The biological aging process is very similar in dogs and people," says University of Washington researcher Matt Kaeberlein, who is spearheading the rapamycin studies. "One piece of evidence for that is dogs get many of the same age-related diseases as people. They just happen seven times faster."

The shorter lifespan of dogs means longevity studies that would take decades with humans can be done in a few years. Dogs also share our environment, something that can't really be replicated in a lab.

Matt Kaeberlein

Dogs are no doubt a refreshing change for Kaeberlein, who has three of his own and previously worked with less engaging species, namely yeast, flies, worms and mice. And when word first got out about the Dog Aging Project, there was a bit of a media frenzy to cast some positive light on the still emerging science of aging.

"People really love their dogs," says Kaeberlein. "So this study engages the general public in geroscience in a way that nothing else can."

"Geroscience" is the recently-minted term for the science of aging.

Since age is the single highest risk factor for many chronic conditions, including heart disease, cancer and Alzheimer's, Kaeberlein says it makes sense to concentrate more on the aging process itself.

"If we're successful at understanding aging and can learn how to manipulate those processes, we have the opportunity to really delay the onset and progression of multiple, age-related diseases," he explains. "From a therapeutic perspective, targeting aging is the ultimate preventative medicine. The idea is to keep people, or dogs, from developing these diseases of aging in the first place."

Of course, manipulating the aging process is easier said than done. But progress is being made. In recent decades, technology has allowed scientists to better understand how cells age. Researchers discovered cellular pathways that regulate lifespan and began genetically manipulating the proteins that control them in simple organisms, boosting longevity.

That technology has led to a handful of potential medical interventions, including NAD^+ (nicotinamide adenine dinucleotide) precursors, senolytics (senescent cell eliminators), parabiosis (young blood transfusions), and the diabetes drug metformin. There's some evidence that all of them, and some others, can increase lifespan, but Kaeberlein chose rapamycin for the Dog Aging Project because it's the best studied of the lot.

"When you look at the literature, there's not as much evidence to support the other interventions," he says. "With the exception of caloric restriction, rapamycin is by far the most robust and reproducible intervention for not only increasing lifespan but also for delaying a variety of age-related diseases."

Rapamycin was discovered in soil samples from Easter Island in the early 1970s. Produced by a bacterium, it proved to have antifungal, anti-cancer, and immune-suppressing properties. Developed into pharmaceutical drugs, rapamycin is primarily used today to treat certain kinds of cancers and as an anti-rejection therapy for transplant patients.

In 2006, Kaeberlein and colleagues found that rapamycin could boost the lifespan of yeast.[1] Subsequent studies found similar results with flies, worms and mice.[2,3]

Rapamycin inhibits **mTOR**, a pathway for cellular growth.

Excess mTOR can stimulate cell growth and block autophagy, which is removal of accumulated waste products inside cells.

Many of the problems that come with aging arise from uncontrolled growth or aging cells that have accumulated so much internal cellular debris that they lose healthy functionality.

Examples of the problems that excess cell proliferation creates include cancers, osteoporosis caused by overzealous osteoclasts (cells that remove older bone), and Alzheimer's which is associated with the accumulation of abnormal proteins.

Kaeberlein explains that mTOR "is kind of like a stoplight for the cell. Basically, it's involved in the

decision point where it's either a good time to grow or stop growth and become stress resistant. One of the key things impacting that decision point is food availability. More calories generally mean more growth. Rapamycin tones down mTOR activity. So in some ways, it's like a caloric restriction mimic because it kind of tricks cells into thinking there isn't more food around."

Rapamycin also seems to be safe, a critical consideration when developing a study using people's pets.

"In a lot of ways, the Dog Aging Project is like working with people's children," says Kaeberlein, whose wife Tammi, a University of Washington research scientist, was the lead coordinator for the first trial. "It's really important not to hurt anybody's dog."

The researchers already had data from veterinarians who'd used the drug to treat certain forms of cancer, so they had guidelines for dosage and potential side effects. The primary goal of the first phase of the planned three-phase study was to make sure rapamycin would do no harm to the precious pooches.

"It's a balance between what's the most likely intervention to work and also one we were fairly confident could be administered safely to healthy, older, companion animals," says Kaeberlein.

For the double-blind, placebo-controlled study, the team recruited 24 middle-aged dogs from the local Seattle area and administered rapamycin to 16 of them over the course of 10 weeks. They found no side effects in terms of blood chemistry and changes in behavior, and the rapamycin-treated dogs showed better heart function than the control group.

The dogs got echocardiograms at the beginning and end of the study to test for three parameters of ventricular contraction – how well the heart pumps blood – which declines with age.

"In the rapamycin group, two of the three cardiac parameters were significantly improved, but all three showed positive direction," says Kaeberlein. "That was surprising to me given the short duration and small sample size."

Phase 2 has started and is being conducted at the Texas A&M College of Veterinary Medicine where a rolling enrollment of dogs continues. Eventually, 50 of them will be treated with either rapamycin or a placebo for 6 months, then followed up for 6 months.

"In Phase 2, we're looking at two things," says Kaeberlein. "First, can we replicate the positive heart function we saw in Phase 1 over a longer period? And second, are there any persistent effects? Do changes last after dogs come off rapamycin?"

Phase 3 will be a 600-dog study with Texas A&M as the primary clinical site along with four or five other veterinary teaching hospitals. The dogs will be treated, or not treated, with rapamycin for 3 years, then followed for the rest of their lives.

"The idea is to have a cohort of dogs that are aging rapidly, so if rapamycin has beneficial effects, we'll actually be able to see them in Phase 3," says Kaeberlein. "Unlike Phase 1, which is mostly about safety, and Phase 2, which is mostly about cardiac function, Phase 3 is about lifespan. And to detect an expected **15%** increase in lifespan over a 3-year period, the math said we needed 600 dogs aged 7 or older."

In all three phases, the dogs have to be middle-aged and at least 40 pounds, because big dogs age faster than small ones.

The rapamycin studies are only one part of the Dog Aging Project, which actually had its origins at the University of Georgia a decade ago.

An evolutionary biologist named Daniel Promislow had been studying aging in mammals since his days at Oxford University as a Rhodes Scholar, and he began focusing on dogs after seeing a Science journal cover story on the genetic role in determining the wide range of sizes in canines.

"I began to look at size and longevity in dogs," says Promislow, who was working at the University of Georgia. "In general, larger species of mammals live longer than smaller ones. In dogs, it's the opposite. And a gene that explained the size differences, insulin-like growth factor 1, had, in previous lab studies, also been implicated in aging."

In 2007, Promislow got his hands on a large veterinary database detailing the longevity and cause of death of some 80,000 dogs.

"It was an amazing data set but I knew nothing about veterinary science," he recalls. "So I reached out to the veterinary school and they put me in touch with an assistant professor named Kate Creevy. She and I started working together, and that's when the Dog Aging Project was really born. We published some papers and got excited about the potential of the dog as a model system for aging."

When Promislow's wife got a job in Seattle a few years later, he contacted Kaeberlein and soon landed a position at the University of Washington.

"Matt immediately saw the potential of the Dog Project for intervention studies," says Promislow. "We began putting together the Dog

Aging Project grant proposal to fund a nationwide, long-term longitudinal study of aging."

The longitudinal study, which Promislow oversees, is slated to kick off this year. It will involve 10,000 dogs in its quest to understand why some dogs live longer than others. Dr. Creevy, now at Texas A&M, serves as Chief Medical Officer. The team also includes University of Washington veterinarian Dr. Silvan Urfer, graduate student Kelly Jin and Tammi Kaeberlein. There are four parts to the project.

One is simply how to define aging in dogs.

"With humans, a geriatrician can tell if a person is a healthy ager or not with very simple measurements, like grip strength and the time it takes to walk 10 meters—simple measures that are very predictive of future survival," says Promislow. "We don't have that kind of thing for dogs. So the first thing we want to understand is what healthy aging looks like in a dog."

The second element is to understand the genetic factors that influence whether or not a dog is going to be a healthy ager.

The third is systems biology, a multidisciplinary approach to understanding how the entire network of biological systems works holistically in the aging process.

"We want to understand the mechanisms by which genes affect downstream traits, to see if we can identify biomarkers of aging, ways of measuring a dog that will show whether it's biologically older or younger than its chronological age should be," explains Promislow.

The fourth part, involving about **5%** of the dogs, is Phase 3 of the rapamycin study.

Both Promislow and Kaeberlein are optimistic about funding from the National Institutes of Health, and the response from dog owners who want their pets to participate has been encouraging.

"Pets are important to people, and that's why the Dog Aging Project has had so much resonance," says Kaeberlein. "We're not just going to learn about human aging and how to impact human health; we also have the potential to improve the quality and quantity of life for people's pets." ●

Daniel Promislow and Matt Kaeberlein.

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For more information contact Dr. Kaeberlein at kaeber@uw.edu or visit the Dog Aging Project website at www.dogagingproject.com.

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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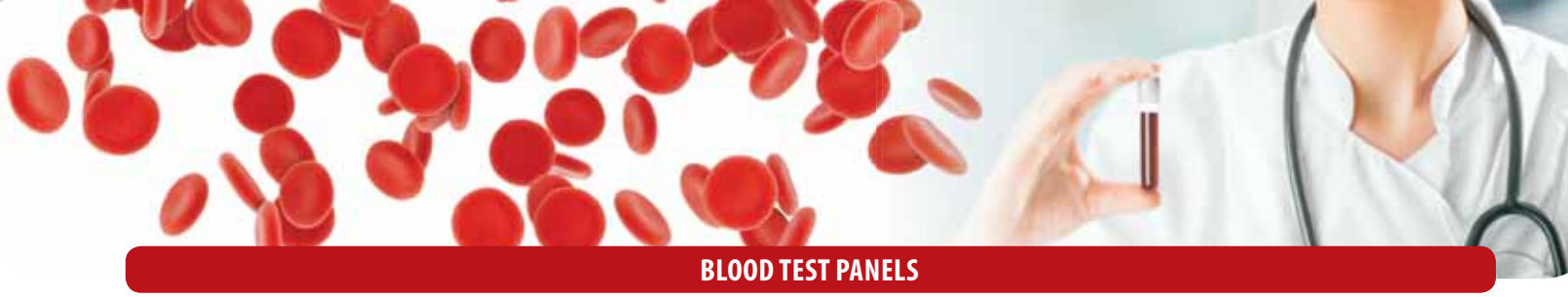

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Skin Restoring Ceramides
Skin Stem Cell Serum
Skin Tone Equalizer
Stem Cell Cream with Alpine Rose
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Vitamins

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

Weight Management & Body Composition

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

Women's Health

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

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
25SUPPORT	**2:5 FOUNDATIONAL SUPPORT**	324.00	195.99				
†††25CHOC	**2:5 LE PLAN CHOCOLATE**	504.00	299.99				
†††25COMBO	**2:5 LE PLAN COMBO**	504.00	299.99				
†††25VAN	**2:5 LE PLAN VANILLA**	504.00	299.99				
	A						
01524	**ACETYL-L-CARNITINE** • 500 mg, 100 veg. caps	32.00	24.00	22.00			
01974	**ACETYL-L-CARNITINE ARGINATE** • 90 veg. caps	38.00	28.50	26.00			
01628	**ADRENAL ENERGY FORMULA** • 60 veg. caps	24.00	18.00	16.50			
01630	**ADRENAL ENERGY FORMULA** • 120 veg. caps	46.00	34.50	31.50			
01807	**ADVANCED APPETITE SUPPRESS** • 60 veg. caps	38.00	28.50	25.50			
02012	**ADVANCED CORTISOL BALANCE** • 30 veg. caps	45.00	33.75	30.00			
01828	**ADVANCED LIPID CONTROL** • 60 veg. caps	30.00	22.50	20.25			
00681	**AHCC®** • 500 mg, 30 caps	61.98	46.49				
24404	**AHCC® (KINOKO® PLATINUM)** • 750 mg, 60 veg. caps	84.95	63.71				
29727	**AHCC® (KINOKO® GOLD)** • 500 mg, 60 veg. caps	74.95	52.47				
00457	**ALPHA-LIPOIC ACID W/BIOTIN** • 250 mg, 60 caps	37.00	27.75	24.00			
02207	**AMPK METABOLIC ACTIVATOR** • 30 veg. tabs	38.00	28.50	24.00			
01509	**ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN®** (Advanced) • 60 veg. caps	39.00	29.25	27.00			
02240	**ANTI-ALCOHOL HEPATOPROTECTION COMPLEX** • 60 veg. caps	22.00	16.50	15.00			
01625	**APPLEWISE** • 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	**ARGININE & ORNITHINE** • 500/250, 100 caps	17.99	13.49				
00038	**ARGININE/ORNITHINE POWDER** • 150 grams	22.95	17.21	14.25			
01624	**(L)-ARGININE CAPS** • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	**ARTERIAL PROTECT** • 30 veg. caps	44.00	33.00	29.00			
01617	**ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX®** 120 veg. caps	44.00	33.00	30.00			
02238	**ARTHROMAX® ADVANCED NT2 COLLAGEN™ & APRÈSFLEX®** 60 veg. caps	34.00	25.50	22.00			
02138	**ARTHROMAX® ELITE** • 30 veg. tablets	30.00	22.50	20.00			
01404	**ARTHRO-IMMUNE JOINT SUPPORT** • 60 veg. caps	32.00	24.00	21.00			
01533	**ASCORBYL PALMITATE** • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	**ASHWAGANDHA EXTRACT** (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	**ASIAN ENERGY BOOST** • 90 veg. caps	24.00	18.00	16.50			
01066	**ASPIRIN** • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	**ASTAXANTHIN WITH PHOSPHOLIPIDS** • 4 mg, 30 softgels	16.00	12.00	10.50			
	B						
01945	**B-COMPLEX** (BioActive Complete) • 60 veg. caps	12.00	9.00	8.00			
00920	**BENFOTIAMINE W/ THIAMINE** • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	**BENFOTIAMINE** (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
00664	**BETA-CAROTENE** • 25,000 IU, 100 softgels	11.75	8.81				
53348	**BETAINE HCl (ENZYMEDICA)** • 120 caps	22.59	16.94				
01622	**BIFIDO GI BALANCE** • 60 veg. caps	20.00	15.00	13.50			
01873	**BILBERRY EXTRACT** • 100 mg, 90 veg. caps	36.00	27.00	24.00			
01512	**BIOACTIVE MILK PEPTIDES** • 30 caps	18.00	13.50	12.00			
††01006	**BIOSIL™** • 5 mg, 30 veg. caps	19.99	15.99				

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
††01007	**BIOSIL™** • 1 fl oz	31.99	25.59				
00102	**BIOTIN** • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	**BLACK CUMIN SEED OIL** • 60 softgels	16.00	12.00	10.50			
01710	**BLACK CUMIN SEED OIL W/BIO-CURCUMIN®** • 60 softgels	32.00	24.00	22.50			
54160	**BLACK VINEGAR (ENZYMEDICA)** • 60 caps	32.99	24.74				
01008	**BLAST™** • 600 grams of powder	26.97	20.23				
70000	**BLOOD PRESSURE MONITOR (ACCUFIT™)** • med/lg cuff	79.99	49.99				
70004	**BLOOD PRESSURE MONITOR** • Digital wrist cuff	69.95	52.46				
02024	**BLOOD PRESSURE** (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00			
01214	**BLUEBERRY EXTRACT** • 60 veg. caps	22.50	16.88	15.00			
01438	**BLUEBERRY EXTRACT W/ POMEGRANATE** • 60 veg. caps	30.00	22.50	20.25			
01506	**BONE FORMULA** (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	**BONE RESTORE** • 120 caps	22.00	16.50	14.25			
02123	**BONE RESTORE** • Chocolate, Sugar-Free • 60 chewable tabs	22.00	16.50	14.25			
01727	**BONE RESTORE W/VITAMIN K2** • 120 caps	24.00	18.00	16.50			
01725	**BONE STRENGTH FORMULA W/KOACT®** • 120 caps	45.00	33.75	30.00			
00313	**BONE-UP®** • 240 caps	28.95	21.71	20.41			
01661	**BORON** • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	**BOSWELLA** • 100 caps	38.00	28.50	22.50			
00984	**BP MANAGEMENT** (Optimal) • 60 tablets	44.00	33.00	30.00			
01253	**BRANCHED CHAIN AMINO ACIDS** • 90 caps	19.50	14.63	12.75			
01942	**BREAST HEALTH FORMULA** • 60 caps	34.00	25.50	22.50			
00893	**BRITE EYES III** • 2 vials, 5 ml each	34.00	25.50	24.00			
01203	**BROMELAIN** (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
	C						
01963	**CALCIUM CITRATE W/VITAMIN D** • 200 veg. caps	18.00	13.50	12.50			
01651	**CALCIUM D-GLUCARATE** • 200 mg, 60 veg. caps	18.00	13.50	11.25			
†01823	**CALREDUCE SELECTIVE FAT BINDER** 120 mint chewable tablets	45.00	33.75	28.50			
01700	**CARDIO PEAK™ W/STANDARDIZED HAWTHORN & ARJUNA** 120 veg. caps	36.00	27.00	24.00			
02018	**CARNITINE** (Optimized) • 60 veg. caps	30.00	22.50	20.00			
01532	**L-CARNITINE** • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01829	**CARNOSINE** • 500 mg, 60 veg. caps	36.00	27.00	24.00			
02020	**CARNOSINE** (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00			
01932	**CAT MIX** • 100 grams powder	14.00	10.50	8.25			
02199	**CHILDREN'S FORMULA LIFE EXTENSION MIX™** 120 chewable tablets	25.00	18.75	17.00			
00550	**CHLORELLA** • 500 mg, 200 tablets	23.98	17.99				
01571	**CHLOROPHYLLIN** • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	***CHO-LESS™** • 90 capsules	37.50	37.50				
01910	**CHOL-SUPPORT™** • 60 liquid veg. caps	48.00	36.00	32.00			
01504	**CHROMIUM W/CROMINEX®** 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	**CINSULIN® W/INSEA2® AND CROMINEX® 3+** • 90 veg. caps	38.00	28.50	25.50			
02300	**CIRCADIAN SLEEP** • 30 liquid veg. caps	28.00	21.00	19.00			

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01906	***CISTANCHE*** (Standardized) • 30 veg. caps	20.00	15.00	12.00			
00818	**CLA BLEND W/SESAME LIGNANS** (Super) • 120 softgels	36.00	27.00	24.75	19.75		
01620	**COFFEEGENIC® GREEN COFFEE EXTRACT** • 400 mg, 90 veg. caps	32.00	24.00	21.00			
02321	**COGNITEX® BASICS** • 30 softgels	32.00	24.00	22.00			
02396	**COGNITEX® ELITE** • 60 tablets	56.00	42.00	38.00			
02397	**COGNITEX® ELITE PREGNENOLONE** • 60 tablets	58.00	43.50	40.00			
01659	**COGNIZIN® CDP-CHOLINE CAPS** • 250 mg, 60 veg. caps	36.00	27.00	25.50			
02202	**COMFORTMAX™** • 30 day supply	44.00	33.00	29.00			
01945	**COMPLETE B-COMPLEX** (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02398	**COMPREHENSIVE NUTRIENT PACKS ADVANCED** • 30 packs	90.00	67.50	61.50			
01949	**COQ10 W/*d*-LIMONENE** (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01951	**COQ10 W/*d*-LIMONENE** (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	20.00			
01929	**COQ10** (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	**COQ10 W/PQQ** (Super Ubiquinol) • 100 mg, 30 softgels	50.00	37.50	30.00	27.00		
01437	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 100 mg, 30 softgels	33.00	24.75	22.00			
01426	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	**CRAN-MAX®** • 500 mg, 60 veg. caps	17.00	12.75	11.25			
01424	**CRAN-MAX® WITH ELLIROSE™** (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	**CREATINE CAPSULES** • 120 veg. caps	10.95	8.21	6.94			
00467	**CURCUMIN®** (Super Bio) • 400 mg, 30 veg. caps	20.00	15.00	14.00			
00407	**CURCUMIN® TURMERIC EXTRACT** (Super Bio) 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	**CURCUMIN® W/GINGER & TURMERONES TURMERIC EXTRACT** (Advanced Bio) • 30 softgels	30.00	22.50	20.25			
01804	**CYTOKINE SUPPRESS™ W/EGCG** • 30 veg. caps	30.00	22.50	20.25			
	COSMESIS						
80105	**ADULT BLEMISH LOTION** • 1 fl. oz	74.50	55.88	49.17			
80157	**ADVANCED PEPTIDE ANTI-OXIDANT SERUM** • 1 fl. oz	53.00	39.75	34.50			
80165	**ADVANCED GROWTH FACTOR SERUM** • 1 fl. oz	65.00	48.75	42.75			
80170	**ADVANCED HYALURONIC ACID SERUM** • 1 fl. oz	45.00	33.75	29.25			
80154	**ADVANCED LIGHTENING CREAM** • 1 oz	65.00	48.75	42.75			
80155	**ADVANCED PEPTIDE HAND THERAPY** • 4 oz	46.00	34.50	29.25			
80152	**ADVANCED TRIPLE PEPTIDE SERUM** • 1 fl. oz	65.00	48.75	42.75			
80140	**ADVANCED UNDER EYE SERUM W/STEM CELLS** • .33 fl. oz	49.00	36.75	31.50			
80137	**ALL-PURPOSE SOOTHING RELIEF** • 1 oz	53.00	39.75	34.07			
80139	**AMBER SELF MICRODERMABRASION** • 2 oz	49.00	36.75	31.50			
80158	**ANTI-AGING FACE OIL** • 1 fl. oz	59.00	44.25	39.00			
80118	**ANTI-AGING MASK** • 2 oz	72.00	54.00	47.52			
80151	**ANTI-AGING REJUVENATING FACE CREAM** • 2 oz	65.00	48.75	42.75			
80153	**ANTI-AGING REJUVENATING SCALP SERUM** • 2 fl. oz	46.00	34.50	29.25			
	SUBTOTAL OF COLUMN 3						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
80134	**ANTI-OXIDANT SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS** • 1 fl. oz	33.00	24.75	23.51			
80133	**ANTI-OXIDANT FACIAL MIST HYDRATOR** • 2 fl. oz	32.00	24.00	22.80			
80156	**COLLAGEN BOOSTING PEPTIDE SERUM** • 1 fl. oz	59.00	44.25	39.00			
80169	**CUCUMBER HYDRA PEPTIDE EYE CREAM** • .5 oz	38.00	28.50	26.00			
80141	**DNA SUPPORT CREAM** • 1 oz	49.00	36.75	31.50			
80167	**ENVIRONMENTAL SUPPORT SERUM** • 1 fl. oz	59.00	44.25	39.00			
80108	**ESSENTIAL PLANT LIPIDS SERUM** • 1 fl. oz	74.95	56.21	49.46			
80163	**EYE LIFT CREAM** • 0.5 fl. oz	59.00	44.25	39.00			
80123	**FACE REJUVENATING ANTI-OXIDANT CREAM** • 2 oz	69.50	52.13	45.87			
80109	**HYALURONIC FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80110	**HYALURONIC OIL-FREE FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80138	**HYDRATING ANTI-OXIDANT FACE MIST** • 4 fl. oz	39.95	29.96	28.50			
80103	**LIFTING & TIGHTENING COMPLEX** • 1 oz	74.50	55.88	49.17			
80168	**MELATONIN ADVANCED PEPTIDE CREAM** • 1 oz	38.00	28.50	26.00			
80114	**MILD FACIAL CLEANSER** • 8 fl. oz	59.00	44.25	38.94			
80159	**MULTI STEM CELL SKIN TIGHTENING COMPLEX** • 1 fl. oz	59.00	44.25	39.00			
80122	**NECK REJUVENATING ANTI-OXIDANT CREAM** • 2 oz	64.00	48.00	42.24			
80150	**RENEWING EYE CREAM** • 1/2 oz	65.00	48.75	42.75			
80142	**RESVERATROL ANTI-OXIDANT SERUM** • 1 fl. oz	46.00	34.50	29.25			
80166	**SKIN FIRMING COMPLEX** • 1 fl. oz	53.00	39.75	34.50			
80112	**SKIN LIGHTENING SERUM** • 1/2 fl. oz	85.00	63.75	56.10			
80130	**SKIN STEM CELL SERUM** • 1 fl. oz	74.00	55.50	51.75			
80164	**SKIN TONE EQUALIZER** • 0.4 fl oz	59.00	44.25	39.00			
80143	**STEM CELL CREAM W/ALPINE ROSE** • 1 oz	66.00	49.50	43.50			
80148	**TIGHTENING & FIRMING NECK CREAM** • 2 oz	39.00	29.25	26.25			
80161	**TRIPLE ACTION VITAMIN C CREAM** • 1 oz jar	59.00	44.25	39.00			
80162	**ULTIMATE MICRODERMABRASION** • 8 fl. oz	39.00	29.25	26.25			
80160	**ULTRA EYELASH BOOSTER** • 0.25 oz	59.00	44.25	39.00			
80101	**ULTRA WRINKLE RELAXER** • 1 fl. oz	89.95	67.46	59.82			
80113	**UNDER EYE REFINING SERUM** • 1/2 fl. oz	74.50	55.88	49.17			
80104	**UNDER EYE RESCUE CREAM** • 1/2 oz	74.50	55.88	49.17			
80171	**VITAMIN C LIP REJUVENATOR** • 0.5 fl. oz	24.00	18.00	15.60			
80129	**VITAMIN C SERUM** • 1 fl. oz	85.00	63.75	56.10			
80136	**VITAMIN D LOTION** • 4 oz	36.00	27.00	25.25			
80102	**VITAMIN K CREAM** • 1 oz	79.50	59.63	52.47			
80149	**YOUTH SERUM** • 1 fl. oz	65.00	48.75	42.75			
	D						
00658	**7-KETO® DHEA METABOLITE** • 25 mg, 100 caps	28.00	21.00	18.00			
01479	**7-KETO® DHEA METABOLITE** • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	**DHA** (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	**DHEA** • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
00335	**DHEA** • 25 mg, 100 caps	16.00	12.00	11.00			
00454	**DHEA** • 15 mg, 100 caps	14.00	10.50	9.00			
00882	**DHEA** • 50 mg, 60 caps	19.00	14.25	12.75			
01689	**DHEA** • 100 mg, 60 veg. caps	24.00	18.00	16.50			
	SUBTOTAL OF COLUMN 4						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01478	**DHEA COMPLETE** • 60 veg. caps	48.00	36.00	32.40			
30747	**DIGEST RC®** • 30 caps	19.95	14.96				
02021	**DIGESTIVE ENZYMES** (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	**DIGESTIVE ENZYMES W/PROBIOTICS** (Enhanced Super)•60 veg. caps	28.00	21.00	18.00			
01671	**D, L-PHENYLALANINE** • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	**DMAE BITARTRATE** • 150 mg, 200 veg. caps	18.00	13.50	11.25			
02270	**DNA PROTECTION FORMULA** • 30 veg. caps	20.00	15.00	13.50			
01931	**DOG MIX** • 100 grams powder	17.00	12.75	11.25			
02006	**DOPA-MIND™** • 60 veg. tabs	44.00	33.00	28.00			
00321	**DR. PROCTOR'S ADVANCED HAIR FORMULA** • 2 oz	39.95	29.96	24.00			
00320	**DR. PROCTOR'S HAIR SHAMPOO** • 8 oz	24.95	18.71	16.50			
	E						
02097	**ENDOTHELIAL DEFENSE™ POMEGRANATE COMPLETE** • 60 softgels	68.00	51.00	46.50			
00997	**ENDOTHELIAL DEFENSE™ W/GLISODIN®** • 60 veg. caps	54.00	40.50	36.00			
02200	**EPA/DHA** (Clearly) • 120 softgels	30.00	22.50	20.00			
01937	**EPA/DHA** (Mega) • 120 softgels	20.00	15.00	13.50			
02033	**ESOPHACOOL™** • 60 chewable tablets	12.00	9.00	8.00			
01737	**ESOPHAGEAL GUARDIAN** (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01894	**ESTROGEN FOR WOMEN** • 30 veg. tabs	30.00	22.50	20.00			
01042	**EUROPEAN LEG SOLUTION DIOSMIN 95** 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	**EXTRAORDINARY ENZYMES** • 60 caps	26.00	19.50	18.00			
02008	**(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL** • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	**EYE PRESSURE SUPPORT W/MIRTOGENOL®** • 30 veg. caps	38.00	28.50	25.50			
	F						
00965	**FAST-ACTING JOINT FORMULA** • 30 caps	39.00	29.25	27.00			
02229	**FAST-C® W/BIO-QUERCETIN PHYTOSOME** • 60 veg. tabs	26.00	19.50	18.00			
01064	**FEMMENESSENCE MACAPAUSE®** • 120 veg. caps	34.99	26.24				
01825	**FLORASSIST® BALANCE** • 30 liquid veg. caps	32.00	24.00	21.00			
02125	**FLORASSIST® GI W/PHAGE TECHNOLOGY**•30 liquid veg. caps	33.00	24.75	22.50			
01821	**FLORASSIST® HEART HEALTH** • 60 veg. caps	32.00	24.00	21.00			
02124	**FLORASSIST® IMMUNE HEALTH** • 30 veg. caps	26.00	19.50	18.00			
02000	**FLORASSIST® MOOD** • 60 caps	33.00	24.75	22.50			
02208	**FLORASSIST® NASAL** • 30 veg. caps	36.00	27.00	24.00			
02120	**FLORASSIST® ORAL HYGIENE** • 30 lozenges	20.00	15.00	13.00			
02203	**FLORASSIST® PREBIOTIC** •Strawberry flavor, 60 chewable tabs	20.00	15.00	13.00			
01920	**FLORASSIST® THROAT HEALTH** • 30 lozenges	20.00	15.00	13.50			
02212	**FOCUS TEA™** • Spearmint flavor, 14 stick packs	20.00	15.00	13.50			
01913	**FOLATE HIGH POTENCY** (Optimized) • 5,000 mcg, 30 veg. tablets	18.00	13.50	12.00			
01939	**FOLATE** (Optimized) • 1,000 mcg, 100 veg. tablets	15.00	11.25	10.00			
01842	**FOLATE + VITAMIN B12** (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	**FORSKOLIN** • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	**FUCOIDAN W/MARITECH® 926** (Optimized) • 60 veg. caps	36.00	27.00	24.75			
	G						
02070	**GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS** • 60 softgels	40.00	30.00	27.00			
02075	**GAMMA E MIXED TOCOPHEROL W/ENHANCED SESAME LIGNANS** • 60 softgels	32.00	24.00	21.75			

SUBTOTAL OF COLUMN 5

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01394	**GARLIC** (Optimized) • 200 veg. caps	24.95	18.71	15.75			
02100	**GASTRO-EASE™** • 60 veg. caps	44.00	33.00	30.00			
02119	**GEROPROTECT® AGELESS CELL™** • 30 softgels	40.00	30.00	27.00			
02133	**GEROPROTECT® LONGEVITY A.I.™** • 30 softgels	56.00	42.00	38.00			
**01122	**GINGER FORCE®** • 60 liquid caps	34.95	26.21				
01658	**GINKGO BILOBA CERTIFIED EXTRACT™** 120 mg, 365 veg. caps	50.00	37.50	33.00			
02218	**GLA WITH SESAME LIGNANS** (Mega) • 30 softgels	22.00	16.50	15.00			
00345	**(L-) GLUTAMINE CAPSULES** • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	**(L-) GLUTAMINE POWDER** • 100 grams	22.00	16.50	15.00			
00522	**GLUCOSAMINE/CHONDROITIN CAPSULES** • 100 caps	38.00	28.50	24.00			
01541	**GLUTATHIONE, CYSTEINE & C** • 100 veg. caps	22.00	16.50	15.00			
02122	**GLYCEMIC GUARD™** • 30 veg. caps	42.00	31.50	28.00			
01669	**GLYCINE** • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
02211	**GRAPE SEED EXTRACT** 100 mg, 60 veg. caps	35.00	26.25	23.00			
00953	**GREEN TEA EXTRACT** (Mega)•lightly caffeinated,100 veg. caps	30.00	22.50	18.00			
00954	**GREEN TEA EXTRACT** (Mega)•decaffeinated, 100 veg. caps	30.00	22.50	18.00			
	H						
01074	**5 HTP** • 100 mg, 60 caps	27.95	20.96				
**02222	**HAIR, SKIN & NAILS REJUVENATION FORM W/VERISOL®** 120 tabs	32.00	24.00	22.00			
01738	**HCA** (Garcinia) • 90 veg. caps	17.00	12.75	11.25			
29754	**HCACTIVE™ GARCINIA CAMBOGIA EXTRACT** • 90 caps	30.00	22.50				
01393	**HEPATOPRO** • 900 mg, 60 softgels	50.00	37.50	34.50			
02121	**HOMOCYSTEINE RESIST** • 60 veg. caps	26.00	19.50	17.50			
01527	**HUPERZINE A** • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	**HYDRODERM®** • 1 oz	79.95	59.96	49.00			
	I						
01704	**IMMUNE MODULATOR W/TINOFEND®** • 60 veg. caps	17.00	12.75	11.25			
00955	**IMMUNE PROTECT W/PARACTIN®** • 30 veg. caps	29.50	22.13	19.91			
02005	**IMMUNE SENESCENCE PROTECTION FORMULA™** •60 veg. tabs	38.00	28.50	26.50			
01674	**INOSITOL CAPSULES** • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	**INTEGRA-LEAN® AFRICAN MANGO IRVINGIA** 150 mg, 60 veg. caps	28.00	21.00	18.00			
30731	**IONIC SELENIUM** • 300 mg, 2 fl. oz	13.69	10.27				
01677	**IRON PROTEIN PLUS** • 300 mg, 100 caps	28.00	21.00	19.50			
01492	**IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX** (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00			
	J, K, L						
52142	**JARRO-DOPHILUS® PROBIOTIC FOR WOMEN** 30 enteric-coated veg. caps	27.95	20.96				
00056	**JARRO-DOPHILUS EPS®** • 60 veg. caps	23.95	17.96				
02034	**K W/ADVANCED K2 COMPLEX** (Super) • 90 softgels	30.00	22.50	20.25			
01600	**KRILL HEALTHY JOINT FORMULA** • 30 softgels	32.00	24.00	21.75			
01050	**KRILL OIL** (Jarrow)• 60 softgels	33.95	25.46				
00316	**KYOLIC® GARLIC FORMULA 102** • 200 veg. caps	28.55	21.41				
00789	**KYOLIC® RESERVE** • 600 mg, 120 caps	30.15	22.61				

SUBTOTAL OF COLUMN 6

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01681	**LACTOFERRIN** • 60 caps	45.00	33.75	30.50			
00020	**LECITHIN** • 16 oz granules	19.00	14.25	12.50			
02355	**LIFE EXTENSION MIX™** • 240 tablets	74.00	55.50	48.00	42.00		
02357	**LIFE EXTENSION MIX™ W/EXTRA NIACIN** • 240 tablets	74.00	55.50	48.00	42.00		
02354	**LIFE EXTENSION MIX™** • 360 caps	78.00	58.50	50.00	44.00		
02356	**LIFE EXTENSION MIX™ POWDER** • 12.70 oz	80.00	60.00	54.00	50.00		
02365	**LIFE EXTENSION MIX™ W/O COPPER** • 240 tablets	74.00	55.50	48.00	42.00		
02364	**LIFE EXTENSION MIX™ W/O COPPER** • 360 caps	78.00	58.50	50.00	44.00		
01608	**LIVER EFFICIENCY FORMULA** • 30 veg. caps	18.00	13.50	12.00			
01639	**5-LOX INHIBITOR W/APRÈSFLEX®** • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	**L-LYSINE** • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	**LYCOPENE** (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
	M						
01992	**MACUGUARD® OCULAR SUPPORT W/SAFFRON•** 60 softgels	25.00	18.75	17.50			
01993	**MACUGUARD® OCULAR SUPPORT W/SAFFRON & ASTAXANTHIN•** 60 softgels	44.00	33.00	30.00			
01459	**MAGNESIUM CAPS** • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	**MAGNESIUM (CITRATE)** • 160 mg, 100 veg. caps	13.00	9.75	8.50			
02107	**(EXTEND-RELEASE) MAGNESIUM** • 60 veg. caps	13.00	9.75	8.75			
02209	**MALE VASCULAR SEXUAL SUPPORT** • 30 veg. caps	24.00	18.00	16.00			
01908	**MEDITERRANEAN TRIM WITH SINETROL™-XPUR** 60 veg. caps	18.00	13.50	12.00			
02109	**MEDITERRANEAN WHOLE FOOD BLEND** • 90 veg. caps	44.00	33.00	30.00			
01668	**MELATONIN** • 300 mcg, 100 veg. caps	7.00	5.25	4.50			
01083	**MELATONIN** • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	**MELATONIN** • 1 mg, 60 caps	5.00	3.75	3.47			
00330	**MELATONIN** • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	**MELATONIN** • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	**MELATONIN** • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
02234	**MELATONIN** (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
02201	**MELATONIN IR/XR** • 60 caps	12.00	9.00	7.50			
01787	**MELATONIN TIMED RELEASE** • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	**MELATONIN TIMED RELEASE** • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	**MELATONIN TIMED RELEASE** • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
02101	**MEMORY PROTECT** • 36 day supply	24.00	18.00	16.00			
02204	**MENOPAUSE 731™** • 30 tablets	36.00	27.00	24.00			
01536	**METHYLCOBALAMIN** • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	**METHYLCOBALAMIN** • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	**MIGRA-EEZE™** (Butterbur) • 60 softgels	33.00	24.75	22.00			
01522	**MILK THISTLE** (European) • 60 veg. caps	34.00	25.50	22.50			
01922	**MILK THISTLE** (European) • 60 softgels	28.00	21.00	18.75			
01925	**MILK THISTLE** (European) • 120 softgels	44.00	33.00	30.00			
01940	**MIRAFORTE W/STANDARDIZED LIGNANS** (Super) • 120 veg caps	62.00	46.50	42.00			
01869	**MITOCHONDRIAL BASICS W/PQQ** • 30 caps	40.00	30.00	27.00			
01868	**MITOCHONDRIAL ENERGY OPTIMIZER W/PQQ** •120 caps	68.00	51.00	45.00			
00065	**MK-7** • 90 mcg, 60 softgels	28.00	21.00	18.75			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
00451	**MSM** (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
02221	**MUSCLE STRENGTH & RESTORE FORMULA** • 94.2 grams powder	36.00	27.00	24.00			
	N						
01534	**N-ACETYL-L-CYSTEINE** • 600 mg, 60 veg. caps	14.00	10.50	9.25			
01904	**NAD⁺ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE** 100 mg, 30 veg. caps	24.00	call for pricing				
02144	**NAD⁺ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE** 250 mg, 30 veg. caps	48.00	call for pricing				
02148	**NAD⁺ CELL REGENERATOR™ W/RESVERATROL** (Optimized) 30 veg. caps	54.00	call for pricing				
01603	**NEURO-MAG® MAGNESIUM L-THREONATE** • 90 veg. caps	40.00	30.00	27.00			
02032	**NEURO-MAG® MAGNESIUM L-THREONATE** 93.35 grams • Tropical Punch Flavor	38.00	28.50	26.00			
02090	**NITROVASC™** • 30 veg. caps	18.00	13.50	12.00			
01903	**NK CELL ACTIVATOR™** • 30 veg. tablets	45.00	33.75	31.50			
00373	**NO FLUSH NIACIN** • 800 mg, 100 caps	19.00	14.25	12.75			
02231	**NT2 COLLAGEN™** • 40 mg, 60 small caps	34.00	25.50	22.00			
	O						
01824	**OLIVE LEAF VASCULAR SUPPORT W/CELERY SEED EXTRACT** (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	**OMEGA-3 PLUS EPA/DHA W/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN** (Super)• 120 softgels	45.00	33.75	31.50	24.75		
01983	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 240 easy-to-swallow softgels	32.00	24.00	21.00	17.25		
02092	**ONCE-DAILY HEALTH BOOSTER** • 30 softgels	30.00	22.50	20.00			
02091	**ONCE-DAILY HEALTH BOOSTER** • 60 softgels	54.00	40.50	38.00			
02313	**ONE-PER-DAY** • 60 tablets	23.00	17.25	16.00			
01328	**ONLY TRACE MINERALS** • 90 veg. caps	15.00	11.25	9.38			
	P						
01789	**PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL** 30 softgels	15.00	11.25	10.50	9.00		
01790	**PALMETTOGUARD® SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL** • 60 softgels	28.00	21.00	19.50	18.00		
02303	**PEA DISCOMFORT RELIEF** • 60 chewable tablets	34.00	25.50	23.00			
*00342	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 454 grams powder	115.95	98.56				
*01080	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 270 veg. caps	82.95	70.51				
01811	**PEONY IMMUNE** • 60 veg. caps	36.00	27.00	24.00			
01953	**POMEGRANATE COMPLETE** • 30 softgels	24.00	18.00	15.75			
00956	**POMEGRANATE FRUIT EXTRACT** • 30 veg. caps	19.50	14.63	13.16			
~01837	**POMI-T®** • 60 veg. caps	38.00	28.50	26.00			
00577	**POTASSIUM IODIDE** • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	**PQQ CAPS** • 10 mg, 30 veg. caps	18.00	13.50	11.00	10.00		
01647	**PQQ CAPS** • 20 mg, 30 veg. caps	32.00	24.00	18.00	17.00		
00302	**PREGNENOLONE** • 50 mg, 100 caps	26.00	19.50	16.50			

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
00700	**PREGNENOLONE** • 100 mg, 100 caps	22.00	16.50	15.00			
**01373	**PRELOX® ENHANCED SEX FOR MEN** • 60 tablets	52.00	39.00	36.00			
00525	**PROBOOST™ THYMIC PROTEIN A** • 30 packets	66.60	49.95				
01441	**PROGESTA-CARE®** • 4 oz cream	36.39	27.29	25.72			
02029	**PROSTATE FORMULA** (Ultra) • 60 softgels	38.00	28.50	26.25	24.00		
01909	**PROSTAPOLLEN™** (Triple strength) • 30 softgels	28.00	21.00	18.75			
02261	**PROTEIN CONCENTRATE** (Whey) Chocolate • 640 gram	30.00	22.50	19.95			
02260	**PROTEIN CONCENTRATE** (Whey) Vanilla • 500 grams	30.00	22.50	19.95			
02246	**PROTEIN ISOLATE** (Advanced Whey) Vanilla • 454 grams	30.00	22.50	19.50			
02243	**PROTEIN ISOLATE** (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
02242	**PROTEIN ISOLATE** (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
02127	**PROTEIN (PLANT) COMPLETE & AMINO ACID COMPLEX** 15.87 oz	34.00	25.50	23.00			
01812	**PROVINAL® PURIFIED OMEGA-7** • 30 softgels	27.00	20.25	18.00			
01676	**PS CAPS** (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01209	**PUMPKIN SEED EXTRACT** (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	**PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT** 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	**PYRIDOXAL 5'-PHOSPHATE** • 100 mg, 60 veg. caps	22.00	16.50	14.85			
	Q, R						
02302	**QUERCETIN** (Bio) • 30 veg. caps	12.00	9.00	8.00			
01309	**QUERCETIN** (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
02169	**RAINFOREST BLEND GROUND COFFEE** • 12 oz. bag	13.00	9.75				
02171	**RAINFOREST BLEND WHOLE BEAN COFFEE** 12 oz. bag	13.00	9.75				
02170	**RAINFOREST BLEND DECAF GROUND COFFEE** 12 oz. bag	14.00	10.50				
01030	**RED YEAST RICE** (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	**REGIMINT** • 60 enteric-coated caps	19.95	14.96	14.00			
01708	**REISHI EXTRACT MUSHROOM COMPLEX** • 60 veg. caps	30.00	22.50	20.25			
01448	**REJUVENEX® BODY LOTION** • 6 fl. oz	24.00	18.00	14.85	12.75		
01621	**REJUVENEX® FACTOR FIRMING SERUM** • 1.7 oz	65.00	48.75	37.50			
01220	**REJUVENEX®** (Ultra) • 2 oz	52.00	39.00	33.00	29.25		
00676	**REJUVENIGHT®** (Ultra) • 2 oz	39.95	29.96	27.00			
02210	**RESVERATROL** • 100 mg, 60 veg. caps	32.00	24.00	21.00			
02230	**RESVERATROL** (Optimized) • 60 veg. caps	45.00	33.75	30.00			
00889	**RHODIOLA EXTRACT** • 250 mg, 60 veg. caps	16.00	12.00	10.50			
01900	**RIBOGEN™ FRENCH OAK WOOD EXTRACT** 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	**(D) RIBOSE POWDER** • 150 grams	27.50	20.63	18.56			
01473	**(D) RIBOSE TABLETS** • 100 veg. tabs	32.00	24.00	21.00			
01208	**R-LIPOIC ACID** (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	**RNA CAPSULES** • 500 mg, 100 caps	17.95	13.46	12.12			
	S						
01432	**SAFFRON W/SATIEREAL®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
02175	**SAMe** (S-Adenosyl-Methionine) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
02176	**SAMe** (S-Adenosyl-Methionine) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			

SUBTOTAL OF COLUMN 9

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02174	**SAMe** (S-Adenosyl-Methionine) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	**SEA-IODINE™** • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
01879	**SE-METHYL L-SELENOCYSTEINE** • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
02301	**SENOLYTIC ACTIVATOR** • 24 veg. caps	24.00	18.00	16.00			
00318	**SERRAFLAZYME** • 100 tablets	18.00	13.50	12.00			
01626	**SEX FOR WOMEN 50+** (Enhanced) • 90 veg. caps	59.00	44.25	34.00			
01938	**SHADE FACTOR™** • 120 veg. caps	44.00	33.00	30.00			
02110	**SHADE FACTOR™ SUNSCREEN LOTION** • 4 fl. oz	20.00	15.00	13.00			
02118	**SHADE FACTOR™ SUNSCREEN SPRAY** • 6 fl. oz	22.00	16.50	14.25			
01884	**SILYMARIN** • 100 mg, 90 veg. caps	14.00	10.50	9.50			
02129	**SKIN CARE COLLECTION ANTI-AGING SERUM** • 1.75 fl. oz	60.00	45.00	37.50			
02132	**SKIN CARE COLLECTION BODY LOTION** • 6 oz	28.00	21.00	18.00			
02130	**SKIN CARE COLLECTION DAY CREAM** • 1.65 oz	50.00	37.50	33.00			
02131	**SKIN CARE COLLECTION NIGHT CREAM** • 1.65 oz	39.00	29.25	27.00			
02096	**SKIN RESTORING CERAMIDES** 30 liquid veg. caps	25.00	18.75	17.25			
01444	**SLEEP** (Quiet) • 60 veg. caps	13.00	9.75	7.50			
01445	**SLEEP MELATONIN** (Quiet) • 5 mg, 60 veg. caps	18.00	13.50	12.00			
01551	**SLEEP W/ MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	**SLEEP W/O MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
00657	**SOLARSHIELD® SUNGLASSES** • Smoke color	12.99	9.74	8.63			
01097	**SOY EXTRACT** (Ultra) • 150 veg. caps	76.00	57.00	50.00			
01649	**SOY ISOFLAVONES** (Super Absorbable) • 60 veg. caps	28.00	21.00	18.75			
00432	**STEVIA™** (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	**STEVIA™ ORGANIC LIQUID SWEETENER** (Better) • 2 oz	11.00	8.25				
00987	**STRESS RELIEF** (Enhanced) • 30 veg. caps	28.00	21.00	18.00			
01476	**STRONTIUM** • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	**SUPER SELENIUM COMPLEX** • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	T						
02023	**TART CHERRY W/CHERRYPURE®** 60 veg. caps	20.00	15.00	14.00			
01827	**TAURINE** • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
02205	**TEA CRYSTALS** (Kenyan Green) • 14 stick packs	12.00	9.00	8.00			
02206	**TEA CRYSTALS** (Kenyan Purple) • 14 stick packs	18.00	13.50	12.00			
01918	**TEAR SUPPORT W/MAQUIBRIGHT®** • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	**L-TAURINE POWDER** • 300 grams	20.00	15.00	12.66			
*13685	**TEN MUSHROOM FORMULA®** • 120 veg. caps	42.95	36.51				
01304	**THEAFLAVIN STANDARDIZED EXTRACT** • 30 veg. caps	18.00	13.50	12.00			
01683	**(L) THEANINE** • 100 mg, 60 veg. caps	24.00	18.00	15.38			
***01038	**THERALAC® PROBIOTICS** • 30 caps	47.95	35.96				
00668	**THYROID FORMULA** (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	**TMG POWDER** • 50 grams	14.00	10.50	8.25			
01859	**TMG** • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	**TOCOTRIENOLS** (Super Absorbable) • 60 softgels	30.00	22.50	21.00			
01278	**TOOTHPASTE** • 4 oz tube (Mint)	9.50	7.13	6.50			
01917	**TRANQUIL TRACT™** • 60 veg. caps	52.00	39.00	34.50			

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01468	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT** 60 veg. caps	24.00	18.00	16.50			
01469	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL** • 60 veg. caps	32.00	24.00	22.20			
02003	**TRIPLE ACTION THYROID** • 60 veg. caps	36.00	27.00	24.00			
01803	**TRI SUGAR SHIELD®** • 60 veg. caps	36.00	27.00	24.00			
01386	**TRUFIBER™** • 180 grams	32.95	24.71				
01389	**TRUFLORA® PROBIOTICS** • 32 veg. caps	42.95	32.21				
01722	**L-TRYPTOPHAN** • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	**TRYPTOPHAN PLUS** (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02317	**TWO-PER-DAY CAPSULES** • 60 caps	13.00	9.75	8.50			
02314	**TWO-PER-DAY CAPSULES** • 120 caps	24.00	18.00	16.00			
02316	**TWO-PER-DAY TABLETS** • 60 tablets	12.00	9.00	7.50			
02315	**TWO-PER-DAY TABLETS** • 120 tablets	23.00	17.25	15.50			
00326	**L-TYROSINE** • 500 mg, 100 tablets	13.50	10.13				
	U, V						
01921	**URIC ACID CONTROL** • 60 veg. caps	24.00	18.00	16.50			
00213	**VANADYL SULFATE** • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
02102	**VENOFLOW™** • 30 veg. caps	52.00	39.00	36.00			
00408	**VENOTONE** • 60 caps	18.95	14.21	12.00			
01327	**VINPOCETINE** • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	**VITAMIN B3 NIACIN** • 500 mg, 100 caps	7.65	5.74	4.99			
02028	**VITAMIN B5** • 500 mg, 100 veg. caps (Pantothenic Acid)	14.00	10.50	9.50			
01535	**VITAMIN B6** • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	**VITAMIN B12** • 500 mcg, 100 lozenges	8.75	6.56	5.44			
02228	**VITAMIN C and BIO-QUERCETIN PHYTOSOME** 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
02227	**VITAMIN C and BIO-QUERCETIN PHYTOSOME** 1,000 mg, 250 veg. tablets	30.00	22.50	20.00			
00084	**VITAMIN C POWDER** (Buffered) • 454 grams	28.00	21.00	19.00			
01736	**VITAMIN C-MAGNESIUM CRYSTALS** (Effervescent) • 180 grams	20.00	15.00	13.50			
01753	**VITAMIN D3** • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	**VITAMIN D3** • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	**VITAMIN D3** • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	**VITAMIN D3** • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	**VITAMIN D3 W/SEA-IODINE™** • 5,000 IU, 60 caps	14.00	10.50	9.38			
02244	**VITAMIN D3 LIQUID** • 2,000 IU, 1 fl. oz, unflavored	28.00	21.00	18.75			
02232	**VITAMIN D3 LIQUID** • 2,000 IU, 1 fl. oz, mint flavor	28.00	21.00	18.75			
02040	**VITAMINS D AND K W/SEA-IODINE™** • 60 caps	24.00	18.00	16.50			
01863	**VITAMIN E** (Super) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	**VITAMIN K2** (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
	W						
01902	**WAIST-LINE CONTROL™** • 120 veg. caps	42.00	31.50	28.50			
02151	**WELLNESS CODE™ APPETITE CONTROL BAR** Cocoa Quinoa Crunch • Box of 12 Bars	40.00	30.00				
^02146	**WELLNESS BAR** • Chocolate Brownie • Box of 12 Bars	32.00	24.00				
^02147	**WELLNESS BAR** • Cookie Dough • Box of 12 Bars	32.00	24.00				
02220	**WELLNESS SHAKE** • Chocolate • 656 grams	50.00	37.50	34.00			
02219	**WELLNESS SHAKE** • Vanilla • 648 grams	50.00	37.50	34.00			
	SUBTOTAL OF COLUMN 11						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	X, Y						
01919	**X-R SHIELD** • 90 veg. caps	15.00	11.25	9.75			
00409	**XYLIWHITE™ MOUTHWASH** • 16 fl. oz	10.00	7.50				
	Z						
01813	**ZINC HIGH POTENCY** • 50 mg, 90 veg. caps	9.00	6.75	6.00			
01561	**ZINC LOZENGES** • 60 veg. lozenges	9.00	6.75	6.00			
01961	**ZINC LOZENGES** (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
**01254	**ZYFLAMEND™ WHOLE BODY** • 120 liquid veg. caps	72.95	54.71				
	BOOKS						
33842	**HEART ATTACK PROOF** by Michael Ozner, MD • 2018	19.95	11.99				
33998	**THE RIGHT TO TRY** by Darcy Olsen • 2016	26.99	20.24				
33875	**DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN** • by Sandeep Jauhar • 2015	26.00	19.50				
33874	**MISSING MICROBES** • by Martin J. Blaser, MD • 2014	28.00	21.00				
DPT05	**DISEASE PREVENTION AND TREATMENT, FIFTH EDITION** (Hardcover) • 2014	69.95	39.95	36.00			
33862	**I'M TOO YOUNG FOR THIS** • by Suzanne Somers • 2013	26.00	19.50				
33835	**PHARMOCRACY** • by William Faloon • 2011	24.00	9.60	8.00			
33838	**YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY** by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	**KNOCKOUT** • by Suzanne Somers • 2009	25.99	17.00				
34132	**TWO'S COMPANY: FIFTY YEAR ROMANCE** by Suzanne Somers • 2017	26.00	19.50				
33867	**THE COMPLETE MEDITERRANEAN DIET** by Michael Ozner, MD • 2014	19.95	9.99				
	SUBTOTAL OF COLUMN 12						

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42 VITAMIN C REDUCES HUMAN MORTALITY
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CoQ10 blocks the transmission of **migraine pain** and lessens the duration and frequency of migraines by more than **50%**.

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